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DUMKAL COLLEGE

P.O-Basantapur,P.S-Dumkal,Dist.-Murshidabad,WestBengal, PIN-742406 (Govt.Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

2nd CYCLE NAAC ACCREDITATION PROCESS-2024

CRITERIA: 1 – Curricular Aspects

Key Indicator: 1.1: Curricular Planning and Implementation

Metric: 1.1.1: The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

Syllabus Distribution (2018-2019 to 2022-2023)

Name of the	Semester	Paper	Content	No of
Teacher	/Year			classes
				allotted
DR SWATI	Ι	CC/T/02	Cartography	
MOLLAH			Maps	
			Concept of Scales	30
			Coordinate Systems	
	II	CC/T/04	Cartograms and Thematic Maps	
	Semester		Isopleth and Choropleth	
			Climograph, Hythergraph and Ergograph	30
			Demographic Charts and Diagrams	
			Concepts of Bearing	
	PART II	PAPER IV-	Scope and content of Hydrology	
		Group B	Mode of occurrence of water	
			Hydrological Cycle	
			Factors of run-off and infiltration	18
			Factors of groundwater movement and	
			storage	
		PAPER V-	Definition and stages of Remote Sensing	50
		Group B	EMR and Spectral ranges	
			Sensor Resolution	
			Concept of FCC	
			Remote Sensing Platforms and Sensors	
			Concept of Aerial Photography	
			Photo interpretation Keys	
			Fundamental concepts of GIS	
			Use of RS data in GIS	
			GIS data format	
			GIS data analysis	
			GPS	
			Applications of RS and GIS	
	Part III	PAPER X	Cartograms and Thematic mapping	
			Weather map interpretation	
			Topographical map interpretation	60
			Morphometric analysis of drainage basin	1
			Structure of research report	1
			Fieldwork in Geographical studies	1
			Field techniques and tools-1	1
			Field techniques and tools-2	1
			Designing a field report]

Name of the	Semester	Paper	Content	No of
Teacher				classes
		00/5 /04		allotted
ARINDOM	Semester I	CC/1/01	Earth's tectonic and structural evolution	
BISWAS			Earth's interior	4 5
			Concept of Isostasy	45
			Earth movements	
		CC/1/02	Topographical Maps	
			Types of Rocks and Minerals and	2.2
			Characteristics	30
			Concept of Bedding Plane, Unconformity	
			and Non-conformity, Thickness of Bed, Dip,	
			Ihrow, Hade, Heave	
		CCP/02	Construction of Scales	30
			Construction of Projections	
	Semester II	CCP/04	Diagrammatic Representation of Data	30
			Representation of Data on Map	
	PART II	PAPER IV	Layering of atmosphere	
		Group A	Insolation	60
			Heat budget	
			Horizontal and Vertical distribution of	
			temperature	
			Inversion of temperature	
			Pressure belts and air masses	
			General wind circulation	
			Jet stream	
			Monsoon mechanism	
			Process and forms of condensation	
			Forms and mechanisms of precipitation	
			Cyclones	
			World climatic classification	
		PAPER IV	Nature and scope of Oceanography	
		Group A	Distribution of land and water	
			Properties of sea water	
			Ocean currents	25
			Coral reefs	
	PART III	PAPER XI	Projections	
			Surveying	
			Megascopic identification of rocks and	60
			minerals	
			Field works and field reports	

Accerti Mollah Ho D Department of Geography Dumkai Colege Basantapur, Murshidabad

SYLLABUS DISTRIBUTION FOR THE SESSION 2018-2019

Department of Geography

Dumkal College

Name of the Teacher	Semester	Paper	Content	No of classes allotted
SUJAUDDIN	II	CC/T/03	Introduction to Human Geography	
	Semester		Evolution of Humans; Concept of Race and	
			Ethnicity; Major Racial Groups of the World	45
			Space, Society and Cultural Regions	
			(Language and Religion)	
			Concept of culture	
	PART III	PAPER	Scope and content of Social and Cultural	
		VII	Geography	
			Social geography of rural India	
			Concepts of culture, community, Caste and	80
			society	
			Settlement as social entities	
			Classification of settlement	
			Morphological theories	
			Scope and content of Political Geography	
			Heartland and Rimland theories	
			Boundaries and Frontiers	
			Nature of administrative areas	

Secreti Mollah Ho D Department of Geography Dumkal College Basantapur, Murshidabae

Name of the	Year	Paper	Content	No of
Teacher				classes
				allotted
MUSTAQUE	PART III	PAPER IX	Concepts of region	70
RAHAMAN			Methods of regional delineation	
			Indicators of regional imbalances	
			Study of regions	
			Concept of regional planning	
			Study of planning regions of India	
			Regional Geography of West Bengal	

Seconti Mollah Ho D Department of Geography Dumkal College Basantaput, Murshidabae

Name of the	Year	Paper	Content	No of
Teacher				classes allotted
AMANUL	PART III	PAPER	Scope and content of Economic Geography	
HOQUE		VIII	Sectors of Economy	
			Primary economic activities	80
			Industries	

Secreti Mollah Ho D Department of Geography Dumkal College Basantapur, Murshidabae

Name of the	Semester	Paper	Content	No of
Teacher	/Year			classes
		CC /TT (02		allotted
DR SWATT	Semester	CC/T/02	Cartography	
MULLAH (U.D.)	1		Maps	20
(חטש)			Concept of Scales	30
	TT		Coordinate Systems	
	ll Comostor	UC/1/04	Learloth and Chananlath	
	Semester		Isopietn and Unoropietn	20
			Engograph, Hythergraph and	30
			Domographic Charts and Diagrams	
			Concepts of Possing	
	Dort III	DADED V	Concepts of Deal Ing	
	FaltIII	FAFERA	Weather man interpretation	
			Topographical map interpretation	60
			Morphometric analysis of drainage	00
			hasin	
			Structure of research report	
			Fieldwork in Geographical studies	
			Field techniques and tools-1	
			Field techniques and tools-2	_
			Designing a field report	
	Semester	CC/P/06	Data Matrix	60
	III	00/1/00	Frequency Table	00
			Measures of Central Tendency	
			Dispersion	
			Histograms and Frequency Curve	
			Scatter Diagram and Regression Line	
			Residual from Regression	
		SEC/P/01	Numbering Systems	60
		/ / -	Data Computation, Storing and	
			Formatting in Spreadsheets	
			Preparation of Annoted Diagrams and	
			its Interpretation	
			Internet Surfing	60
	Semester	CC/P/10	Questionnaire for perception survey	
	IV		Environmental mapping	
			Quality assessment of soil using field	
			kit	
			Interpretation of air quality	
			Project file	
		SEC/P/02	Spatial and Non-spatial data	60
			Nearest Neighbour Analysis	
			Probability and Normal Distribution	
			Skewness	

Sampling	
Correlation and Regression Analysis	
Time Series Analysis	

Devati Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabad

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
ARINDOM	Semester I	CC/T/01	Earth's tectonic and structural evolution	
BISWAS			Earth's interior	
			Concept of Isostasy	45
			Earth movements	
		CC/T/02	Topographical Maps	
			Types of Rocks and Minerals and	
			Characteristics	30
			Concept of Bedding Plane, Unconformity	
			and Non-conformity, Thickness of Bed, Dip,	
			Throw, Hade, Heave	
		CCP/02	Construction of Scales	30
Semester II PART II			Construction of Projections	
	CCP/04	Diagrammatic Representation of Data	30	
			Representation of Data on Map	
	PART II	PAPER IV	Layering of atmosphere	
		Group A	Insolation	60
			Heat budget	
			Horizontal and Vertical distribution of	
			temperature	
			Inversion of temperature	
			Pressure belts and air masses	
			General wind circulation	
			Jet stream	
			Monsoon mechanism	
			Process and forms of condensation	
			Forms and mechanisms of precipitation	
			Cyclones	-
			World climatic classification	
		PAPER IV	Nature and scope of Oceanography	
		Group A	Distribution of land and water	

		Properties of sea water	
		Ocean currents	25
		Coral reefs	
PART III	PAPER XI	Projections	
		Surveying	
		Megascopic identification of rocks and	60
		minerals	
		Field works and field reports	
Semester III	CC/T/05	Nature, Composition and Layering of the	45
		Atmosphere	
		Insolation	
		Temperature	
		Inversion of Temperature	
		Greenhouse Effect and Importance of Ozone	
		Layer	
Semester IV	CC/T/08	Concept of region, Types and delineation	90
		Types of planning, principles and techniques	
		of regional planning	
		Needs of regional planning, multi level	
		planning in India	
		Concept of metropolitan and urban	
		agglomerations	
		Regionalisation of India for planning	
		Development	
		Theories and models for regional	
		development I	
		Theories and models for regional	
		development II	
		Changing concept of development	
		Concept of underdevelopment	
		Concept and indicators of regional	
		imbalances in India	
		Significance of balanced development in	
		India	
		Human development	
	CC/T/10	Environmental Geography	60
		Perception of environment in different stages	
		of civilization	
		Concept of holistic environment	
		Concept of EIA	
		Ecosystem	
		Environmental pollution and degradation	
		Environmental issues related to agriculture	
		Urban environmental issues	
		Environmental programmes and policies	

Ho D Ho D Department of Geography Dumkai College Basantapur, Murshidabad

Name of the Teacher	Semester	Paper	Content	No of classes allotted
SUJAUDDIN	II	CC/T/03	Introduction to Human Geography	
	Semester		Evolution of Humans; Concept of Race and	
			Ethnicity; Major Racial Groups of the World	45
			Space, Society and Cultural Regions	
			(Language and Religion)	
			Concept of culture	
	PART III	PAPER	Scope and content of Social and Cultural	
		VII	Geography	
			Social geography of rural India	
			Concepts of culture, community, Caste and	80
			society	_
			Settlement as social entities	
			Classification of settlement	
			Morphological theories	
			Scope and content of Political Geography	
			Heartland and Rimland theories	
			Boundaries and Frontiers	
			Nature of administrative areas	

Deati Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabad

Name of the	Year	Paper	Content	No of
Teacher				classes
				allotted
MUSTAQUE	PART III	PAPER IX	Concepts of region	70
RAHAMAN			Methods of regional delineation	
			Indicators of regional imbalances	
			Study of regions	
			Concept of regional planning	
			Study of planning regions of India	
			Regional Geography of West Bengal	

Derati Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabad

Name of the Teacher	Year	Paper	Content	No of classes allotted
AMANUL	PART III	PAPER	Scope and content of Economic Geography	
HOQUE		VIII	Sectors of Economy	
			Primary economic activities	80
			Industries	

Derati Mollah Ho D Department of Geography Dumkal College Basantapur, Murshidabad

Name of the Teacher	Semester	Paper	Content	No of classes
				allotted
DR SWATI	Ι	CC/T/02	Cartography	
MOLLAH			Maps	
			Concept of Scales	30
			Coordinate Systems	
	II	CC/T/04	Cartograms and Thematic Maps	
			Isopleth and Choropleth	
			Climograph, Hythergraph and Ergograph	30
			Demographic Charts and Diagrams	
			Concepts of Bearing	
	III	CC/P/06	Data Matrix	
			Frequency Table	
			Measures of Central Tendency	
			Dispersion	60
			Histograms and Frequency Curve	
			Scatter Diagram and Regression Line	
			Residual from Regression	
		SEC/P/01	Numbering Systems	60
			Data Computation, Storing and Formatting in	
			Spreadsheets	
			Preparation of Annoted Diagrams and its	
			Interpretation	
			Internet Surfing	_
	IV	CC/P/10	Questionnaire for perception survey	
			Environmental mapping	
			Quality assessment of soil using field kit	60
			Interpretation of air quality	_
			Project file	_
		SEC/P/02	Spatial and Non-spatial data	
			Nearest Neighbor Analysis	-

		Probability and Normal Distribution	
		Skewness	60
		Sampling	
		Correlation and Regression Analysis	
		Time Series Analysis	
V	CC/T/11	Research in Geography	
		Literature review and research design	
		Research problem, objectives and hypothesis;	
		Research materials and methods	
		Structure of research report	90
		Fieldwork in Geographical studies	
		Field techniques and tools-1	
		Field techniques and tools-2	
		Designing a field report	
VI	CC/P/14	Project Report	60
	CC/T/14	Concepts of Hazard and Disaster	30

Scoati Mollah Ho D Department of Geography Dumkal College Basantapur, Murshidabae

Name of the Teacher	Semester	Paper	Content	No of classes
reacher				allotted
ARINDOM	I	CC/T/01	Earth's tectonic and structural evolution	
BISWAS	-		Earth's interior	
			Concept of Isostasy	45
			Earth movements	
		CC/T/02	Topographical Maps	
			Types of Rocks and Minerals and	
			Characteristics	30
			Concept of Bedding Plane, Unconformity	
			and Non-conformity, Thickness of Bed, Dip,	
			Throw, Hade, Heave	
		CC/P/02	Construction of Scales	20
			Construction of Projections	
	II	CC/P/04	Diagrammatic Representation of Data	
			Representation of Data on Map	30
	III	CC/T/05	Nature, Composition and Layering of the	
			Atmosphere	
			Insolation	
			Temperature	45
			Inversion of Temperature	ne
			Greenhouse Effect and Importance of Ozone	
			Layer	
	IV	CC/T/08	Concept of region, Types and delineation	
			Types of planning, principles and techniques	
			of regional planning	90
			Needs of regional planning, multi level	
			planning in India	
			Concept of metropolitan and urban	
			agglomerations	
			Regionalization of India for planning	
			Development Theories and models for regional	
			development I	
			Theories and models for regional	
			development II	
			Changing concept of development	
			Concept of underdevelopment	
			Concept and indicators of regional	
			imbalances in India	
			Significance of balanced development in	
			India	
			Human development	
		CC/T/10	Environmental Geography	60
			Perception of environment in different stages	

			of civilization	
			Concept of holistic environment	_
			Concept of EIA	
			Ecosystem	_
			Environmental pollution and degradation	
			Environmental issues related to agriculture	
			Urban environmental issues	
			Environmental programmes and policies	
	V	CC/T/11	Research in Geography	
			Literature review and research design	
			Research problem, objectives and	
			hypothesis; Research materials and	
			methods	60
			Structure of research report	
			Fieldwork in Geographical studies	
			Field techniques and tools-1	-
			Field techniques and tools-2	-
			Designing a field report	
		DSF/T/01A	Urban Geography	45
		DOL/1/01/	Theories of Urban Morphology	T J
			Concept of Hierarchy	-
			Rank Size Rule	-
			Patterns of urbanization in developed and	-
			developing countries	
	VI	CC/T/13	Development of Geography and	45
			contributions of Greek, Chinese and Indian	
			geographers	
			Impact of 'Dark Age' on Geography and	
			Arab contributions	_
			Geography during the Age of 'Discovery'	
			and 'Exploration'	_
			Geography during the Age of 'Discovery'	
			and 'Exploration'	-
			Transition from Cosmography to Scientific	
			Geography	_
			Dualism and Dichotomies	-
			Concepts of Hazard and Disaster	
		CC/P/14	Project Report	20
		CC/T/14	Earthquake	30
			Landslide	4
			Cyclone	4
			Fire	



Name of the Teacher	Semester	Paper	Content	No of classes allotted
DR PRASENJIT	Ι	CC/T/01	Geomorphology	
MONDAL			Degradation processes	
			Models of landscape evolution	45
			Development of river network and landforms	
			on uniclinal and folded structures	
			Evolution of Landforms	
		CC/P/02	Construction and Interpretation of Relief	40
			Profiles, Average Slope, Relative relief and	
			Stream ordering	
			Transect chart	
			Geological Map	
	II	CC/T/04	Basic Concepts of Surveying and Survey	30
			Equipments	
			Basic Concepts of Surveying and Survey	-
			Equipments	
			Interpretation of Land use and landcover maps	
		CC/P/04	Survey	30
			Determination of Height of Objects using	
			Transit Theodolite	
	III	CC/T/05	Condensation	45
			Mechanism of Precipitation	
			Air mass	
			Fronts	
			Weather	
			Circulation in the Atmosphere	
			Monsoon Circulation and Mechanism with	
			reference to India	
			Tropical and Mid-latitude Cyclones	
			Climatic Classification	
	IV	CC/T/09	Concept and classification of economic	-
			activities	
			Drimory activities	45
			Secondary activities	
			Concept of manufacturing region	
			Tertiary activities	
			Agricultural systems	
			Transnational sea-routes: railways and highways	
			with reference to India	
			Designing a field report	
	V	CC/P/11	Field Work	20
		CC/T /12	Definition and stages of Remote Sensing	60

		Platforms and Sensors	
		Sensor resolutions and their applications with	
		reference to IRS and LANDSAT	
		Aerial Photographs	
		Principles of Image interpretation	
		GIS data structures	
		Principles of preparing attributes tables, data	
		manipulation and overlay analysis	
		Principles of GNSS positioning and waypoint	
		collection	
	CC/P/12	Georeferencing of map	60
		Digitization of features	
		Data attachment overlay and preparation of	
		thematic map	
		Preparation of FCC	
		Preparation of LULC map by Supervised Image	
		Classification	
	DSE/T/01	Development of Population Geography	90
		World patterns determinants of population	
		distribution and growth	
		Demographic Transition Model	
		Theories of population growth	
		Population distribution density and growth	
		profile in India	
		Population Composition and Characteristics	
		Determinate measures of Fertility and Mortality	
		Population Composition of India	
		Migration	
		Concept of Human Development Index	
		Population and development	
		Population policies in Selected Countries	
		Contemporary Issues in Population	
VI	DSE/T/04A	Factors of soil formation	90
V I		Concept of soil profile	20
		Definition and significance of Physical soil	
		properties	
		Definition and significance of Chemical soil	
		properties	
		Soil erosion and degradation	
		Principles of soil classification	
		Concepts of ecology biosphere ecosystem	
		biome ecotone community	
		Concept of trophic structure food chain and	
		food web. Energy flow in ecosystems	
		Geographical extent and characteristic of	
		Biomes	
		Bio-geochemical cycles	
		Deforestation	
		Bio-diversity	
			2040

Department of Geography Dumkai College Basantapur, Murshidabad

Name of the Teacher	Semester	Paper	Content	No of classes allotted
SUIAUDDIN	II	CC/T/03	Introduction to Human Geography	unotteu
JUJIODDIN	11	00/1/03	Evolution of Humans: Concept of Bace and	-
			Ethnicity: Major Bacial Groups of the World	45
			Space Society and Cultural Regions	15
			(Language and Poligion)	
			Concent of culture	-
	111	CC/1/07	Physical Perspectives of West Bengal	-
			Population of West Bengal	
			Resources of West Bengal	
			Regional Development of West Bengal	30
	IV	CC/T/09	Meaning and approaches to Economic	
			Geography	
			Concept in Economic geography	45
			Factors influencing location of economic	10
			activity and forces of agglomeration	
			Determining factors of transport costs	-
	VI	DSE/T/03	Natural Resources	45
			Approaches to resource utilization	
			Conservation of Natural Resources	
			Problems of resource depletion	

Department of Geography Dumkai College Basantapur, Murshidabae

Name of the Teacher	Semester	Paper	Content	No of classes allotted
MUSTAQUE	VI	DSE/T/03	Distribution, Utilisation, Problems and	
RAHAMAN			Management of Metallic Resources	
			Distribution, Utilisation, Problems and	
			Management of Non-Metallic Mineral	
			Resources	45
			Problems and Management of Energy	10
			Resources	
			Contemporary Energy Crisis and Future	
			Scenario	
			Limits to Growth and Sustainable use of	
			Resources	

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Devati Mollah Ho D Department of Geography Dumkal College Basantapur, Murshidabae

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Name of the Teacher	Semester	Paper	Content	No of classes allotted
AMANUL	II	CC/T/03	Evolution of Human Society	
HOQUE			Population Growth and Distribution, Population	
			Composition	45
			Demographic Transition Model	
			Population–Resource Regions	
			Population and Environment Relations with special	
			reference to Development–Environment Conflict	
			Social Morphology and Rural House Types in India	
			Types and Patterns of Rural Settlements	
			Functional Classification of Urban Settlements	
			Trends and Pattern of World Urbanization	
	III	CC/T/07	Physical Features of India	
			Regionalisation of India	
			Climate, Soil and Vegetation	
			Population	60
			Distribution of Population by Race, Caste, Religion,	
			Language, Tribes	
			Agricultural Regions	
			Green Revolution and its Consequences	
			Mineral and Power Resources	
			Industrial Development	
	V	DSE/T/0 1A	Ecological process of urban growth	
			City Region	
			Patterns and trends of urbanization in India	45
			Case studies of Delhi, Kolkata with reference to	
			Land use and Urban issues	
	VI	СС/Т/12	Urban renewal programme - JNNURM	
	VI	CC/1/15	Contributions of Humbolt and Ritter	
			Contributions of Ratzel Richthofen and Hettner	
			Schools of Geographical thought	_
			Trends of Geography in the post World War-II	
			period	45
			Evolution of Geographical thought in India	
			Quantitative Revolution and its impact	
			Towards Post Modernism	

Department of Geography Dumkai College Basantapur, Murshidabae

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
DR SWATI	Ι	CC/T/02	Cartography	
MOLLAH			Maps	
			Concept of Scales	30
			Coordinate Systems	
	II	CC/T/04	Cartograms and Thematic Maps	
			Isopleth and Choropleth	
			Climograph, Hythergraph and Ergograph	30
			Demographic Charts and Diagrams	
			Concepts of Bearing	
	III	CC/P/06	Data Matrix	
			Frequency Table	
			Measures of Central Tendency	
			Dispersion	60
			Histograms and Frequency Curve	
			Scatter Diagram and Regression Line	
			Residual from Regression	
		SEC/P/01	Numbering Systems	60
			Data Computation, Storing and	
			Formatting in Spreadsheets	
			Preparation of Annoted Diagrams and its	
			Interpretation	
			Internet Surfing	
	IV	CC/P/10	Questionnaire for perception survey	
			Environmental mapping	
			Quality assessment of soil using field kit	60
			Interpretation of air quality	
			Project file	
		SEC/P/02	Spatial and Non-spatial data	
			Nearest Neighbour Analysis	
			Probability and Normal Distribution	
			Skewness	60
			Sampling	
			Correlation and Regression Analysis	
			Time Series Analysis	
	V	CC/T/11	Research in Geography	
			Literature review and research design	

		Research problem, objectives and	
		hypothesis; Research materials and	
		methods	90
		Structure of research report	
		Fieldwork in Geographical studies	
		Field techniques and tools-1	
		Field techniques and tools-2	
		Designing a field report	
VI	CC/P/14	Project Report	60
	CC/T/14	Concepts of Hazard and Disaster	30

Scoati Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabae

Name of the	Semester	Paper	Content	No of
Teacher		-		classes
				allotted
ARINDOM	Ι	CC/T/01	Earth's tectonic and structural evolution	
BISWAS			Earth's interior	
			Concept of Isostasy	45
			Earth movements	
		CC/T/02	Topographical Maps	
			Types of Rocks and Minerals and	
			Characteristics	30
			Concept of Bedding Plane, Unconformity	
			and Non-conformity, Thickness of Bed, Dip,	
			Throw, Hade, Heave	
		CC/P/02	Construction of Scales	20
			Construction of Projections	
	II	CC/P/04	Diagrammatic Representation of Data	
			Representation of Data on Map	30
	III	CC/T/05	Nature, Composition and Layering of the	
			Atmosphere	
			Insolation	
			Temperature	45
			Inversion of Temperature	
			Greenhouse Effect and Importance of Ozone	
			Layer	
	IV	CC/T/08	Concept of region, Types and delineation	
			Types of planning, principles and techniques	
			of regional planning	90
			Needs of regional planning, multi level	
			planning in India	
			Concept of metropolitan and urban	
			aggiomerations	
			Development	
			Theories and models for regional	
			development I	
			Theories and models for regional	
			development II	
			Changing concept of development	
			Concept of underdevelopment	
			Concept and indicators of regional	
			imbalances in India	
			Significance of balanced development in	
			India	
			Human development	
		CC/T/10	Environmental Geography	60
			Perception of environment in different stages	

		of civilization	
		Concept of holistic environment	
		Concept of EIA	
		Ecosystem	
		Environmental pollution and degradation	
		Environmental issues related to agriculture	
		Urban environmental issues	
		Environmental programmes and policies	
V	CC/T/11	Research in Geography	
		Literature review and research design	
		Research problem, objectives and	
		hypothesis: Research materials and	
		methods	60
		Structure of research report	-
		Fieldwork in Geographical studies	-
		Field techniques and tools-1	-
		Field techniques and tools 7	-
		Pleid techniques and tools-2	-
			45
	DSE/1/01A	Urban Geography	45
		Concerns of Urban Morphology	-
		Domin Size Dule	-
		Ralik Size Kule	-
		developing countries	
VI	CC/T/12	Development of Geography and	45
VI	CC/1/15	contributions of Greek Chinese and Indian	45
		geographers	
		Impact of 'Dark Age' on Geography and	-
		Arab contributions	
		Geography during the Age of 'Discovery'	-
		and 'Exploration'	
		Geography during the Age of 'Discovery'	
		and 'Exploration'	
		Transition from Cosmography to Scientific	
		Geography	
		Dualism and Dichotomies	
		Concepts of Hazard and Disaster	
	CC/P/14	Project Report	20
	CC/T/14	Earthquake	30
		Landslide	
		Cyclone	1
		Fire	1

Acounti Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabad

SYLLABUS DISTRIBUTION FOR THE SESSION 2021-2022

Department of Geography

Dumkal College

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
DR PRASENJIT	Ι	CC/T/01	Geomorphology	
MONDAL			Degradation processes	
			Models of landscape evolution	45
			Development of river network and landforms	-
			on uniclinal and folded structures	
			Evolution of Landforms	
		CC/P/02	Construction and Interpretation of Relief	40
			Profiles, Average Slope, Relative relief and	
			Stream ordering	
			Transect chart	
			Geological Map	
	II	CC/T/04	Basic Concepts of Surveying and Survey	30
			Equipments	
			Basic Concepts of Surveying and Survey	
			Equipments	
			Interpretation of Landuse and landcover maps	
		CC/P/04	Survey	
			Determination of Height of Objects using	30
			Transit Theodolite	
	III	CC/T/05	Condensation	
			Mechanism of Precipitation	
			Air mass	
			Fronts	45
			Weather	
			Circulation in the Atmosphere	
			Monsoon Circulation and Mechanism with	
			reference to India	
			Tropical and Mid-latitude Cyclones	
			Climatic Classification	
	IV	CC/T/09	Concept and classification of economic	
			activities	
			Location theories	45
			Primary activities	_
			Secondary activities	-
			Concept of manufacturing region	-
			Tertiary activities	-
			Agricultural systems	-
			Iransnational sea-routes; railways and	
			highways with reference to India	-
	* 7		Designing a field report	20
	V	CC/P/11	Field Work	20
		CC/1/12	Definition and stages of Remote Sensing	60
			Platforms and Sensors	4
			Sensor resolutions and their applications with	

		reference to IRS and LANDSAT	
		Aerial Photographs	
		Principles of Image interpretation	
		GIS data structures	
		Principles of preparing attributes tables, data	
		manipulation and overlay analysis	
		Principles of GNSS positioning and waypoint	
		collection	
	CC/P/12	Georeferencing of map	60
		Digitisation of features	
		Data attachment overlay and preparation of	
		thematic map	
		Preparation of FCC	
		Preparation of LULC map by Supervised Image	
		Classification	
	DSE/T/0	Development of Population Geography	90
	1	World patterns determinants of population	
	-	distribution and growth	
		Demographic Transition Model	
		Theories of population growth	
		Population distribution, density and growth	
		profile in India	
		Population Composition and Characteristics	
		Determinate measures of Fertility and Mortality	
		Population Composition of India	
		Migration	
		Concept of Human Development Index	
		Population and development	
		Population policies in Selected Countries	
		Contemporary Issues in Population	
VI	DSE/T/0	Factors of soil formation	90
•••	4A	Concept of soil profile	20
		Definition and significance of Physical soil	
		properties	
		Definition and significance of Chemical soil	
		properties	
		Soil erosion and degradation	
		Principles of soil classification	
		Concepts of ecology, biosphere, ecosystem.	
		biome, ecotone, community	
		Concept of trophic structure, food chain and	
		food web: Energy flow in ecosystems	
		Geographical extent and characteristic of Bioms	
		Bio-geochemical cycles	
		Deforestation	
		Bio-diversity	
	1		

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Department of Geography

Dumkal College

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
SUJAUDDIN	II	CC/T/03	Introduction to Human Geography	
			Evolution of Humans; Concept of Race and	
			Ethnicity; Major Racial Groups of the World	45
			Space, Society and Cultural Regions	
			(Language and Religion)	
			Concept of culture	
	III	CC/T/07	Physical Perspectives of West Bengal	
			Population of West Bengal	
			Resources of West Bengal	
			Regional Development of West Bengal	30
	IV	CC/T/09	Meaning and approaches to Economic	
			Geography	
			Concept in Economic geography	45
			Factors influencing location of economic	
			activity and forces of agglomeration	
			Determining factors of transport costs	
	VI	DSE/T/03	Natural Resources	45
			Approaches to resource utilisation	
			Conservation of Natural Resources	
			Problems of resource depletion	

Deoati Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabae

			č	
Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
MUSTAQUE	VI	DSE/T/03	Distribution, Utilisation, Problems and	45
RAHAMAN			Management of Metallic Resources	
			Distribution, Utilisation, Problems and	
			Management of Non-Metallic Mineral	
			Resources	
			Problems and Management of Energy	
			Resources	
			Contemporary Energy Crisis and Future	
			Scenario	
			Limits to Growth and Sustainable use of	
			Resources	

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Dumkal College

Name of	Semester	Paper	Content	No of
the				classes
Teacher				allotted
AMANUL	II	CC/T/03	Evolution of Human Society	
HOQUE			Population Growth and Distribution, Population	
			Composition	45
			Demographic Transition Model	
			Population–Resource Regions	
			Population and Environment Relations with	
			special reference to Development–Environment	
			Conflict	
			Social Morphology and Rural House Types in India	
			Types and Patterns of Rural Settlements	
			Functional Classification of Urban Settlements	
			Trends and Pattern of World Urbanization	
	III	CC/T/07	Physical Features of India	
			Regionalisation of India	
			Climate, Soil and Vegetation	
			Population	60
			Distribution of Population by Race, Caste, Religion,	
			Language, Tribes	
			Agricultural Regions	
			Green Revolution and its Consequences	
			Mineral and Power Resources	
			Industrial Development	
	V	DSE/T/01	Ecological process of urban growth	
		А	City Region	
			Patterns and trends of urbanization in India	45
			Case studies of Delhi, Kolkata with reference to	
			Land use and Urban issues	
			Urban renewal programme - JNNURM	
	VI	CC/T/13	Evolution of Geographical thoughts	45
			Contributions of Humbolt and Ritter	
			Contributions of Ratzel, Richthofen and Hettner	
			Schools of Geographical thought	
			Trends of Geography in the post World War-II	
			period Evolution of Coographical thought in India	
			Evolution of Geographical thought in India	
			Quantitative Revolution and its impact	

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Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
DR SWATI	Ι	CC/T/02	Cartography	
MOLLAH			Maps	
			Concept of Scales	30
			Coordinate Systems	
	II	CC/T/04	Cartograms and Thematic Maps	
			Isopleth and Choropleth	
			Climograph, Hythergraph and Ergograph	30
			Demographic Charts and Diagrams	
			Concepts of Bearing	
	III	CC/P/06	Data Matrix	
			Frequency Table	
			Measures of Central Tendency	
			Dispersion	60
			Histograms and Frequency Curve	
			Scatter Diagram and Regression Line	
			Residual from Regression	
		SEC/P/01	Numbering Systems	60
			Data Computation, Storing and	
			Formatting in Spreadsheets	
			Preparation of Annoted Diagrams and its	
			Interpretation	
			Internet Surfing	
	IV	CC/P/10	Questionnaire for perception survey	
			Environmental mapping	
			Quality assessment of soil using field kit	60
			Interpretation of air quality	
			Project file	
		SEC/P/02	Spatial and Non-spatial data	
			Nearest Neighbour Analysis	
			Probability and Normal Distribution	
			Skewness	60
			Sampling	
			Correlation and Regression Analysis	
			Time Series Analysis	
	V	CC/T/11	Research in Geography	
			Literature review and research design	

		Research problem, objectives and	
		hypothesis; Research materials and	
		methods	90
		Structure of research report	
		Fieldwork in Geographical studies	
		Field techniques and tools-1	
		Field techniques and tools-2	
		Designing a field report	
VI	CC/P/14	Project Report	60
	CC/T/14	Concepts of Hazard and Disaster	30

Scoati Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabae

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
ARINDOM	Ι	CC/T/01	Earth's tectonic and structural evolution	
BISWAS			Earth's interior	
			Concept of Isostasy	45
			Earth movements	
		CC/T/02	Topographical Maps	
			Types of Rocks and Minerals and	
			Characteristics	30
			Concept of Bedding Plane, Unconformity	
			and Non-conformity, Thickness of Bed, Dip,	
			Throw, Hade, Heave	
		CC/P/02	Construction of Scales	20
			Construction of Projections	
	II	CC/P/04	Diagrammatic Representation of Data	
			Representation of Data on Map	30
	III	CC/T/05	Nature, Composition and Layering of the	
			Atmosphere	
			Insolation	
			Temperature	45
			Inversion of Temperature	
			Greenhouse Effect and Importance of Ozone	
			Layer	
	IV	CC/T/08	Concept of region, Types and delineation	
			Types of planning, principles and techniques	
			of regional planning	90
			Needs of regional planning, multi level	
			planning in India	
			Concept of metropolitan and urban	
			agglomerations	
			Regionalisation of India for planning	
			Theories and models for regional	
			development I	
			Theories and models for regional	
			development II	
			Changing concept of development	
			Concept of underdevelopment	
			Concept and indicators of regional	
			imbalances in India	
			Significance of balanced development in	
			India	
			Human development	
		CC/T/10	Environmental Geography	60
			Perception of environment in different stages	

		of civilization	
		Concept of holistic environment	
		Concept of EIA	
		Ecosystem	
		Environmental pollution and degradation	
		Environmental issues related to agriculture	
		Urban environmental issues	
		Environmental programmes and policies	
V	CC/T/11	Research in Geography	
		Literature review and research design	
		Research problem, objectives and	
		hypothesis; Research materials and	
		methods	60
		Structure of research report	
		Fieldwork in Geographical studies	
		Field techniques and tools-1	-
		Field techniques and tools-2	-
		Designing a field report	-
		Urban Goography	45
	DSE/1/01A	Theories of Urban Morphology	45
		Concept of Hierarchy	
		Rank Size Rule	
		Patterns of urbanisation in developed and	
		developing countries	
VI	CC/T/13	Development of Geography and	45
V I	00/1/15	contributions of Greek. Chinese and Indian	15
		geographers	
		Impact of 'Dark Age' on Geography and	
		Arab contributions	
		Geography during the Age of 'Discovery'	
		and 'Exploration'	
		Geography during the Age of 'Discovery'	
		and 'Exploration'	
		Transition from Cosmography to Scientific	
		Geography	
		Dualism and Dichotomies	
		Concepts of Hazard and Disaster	
	CC/P/14	Project Report	20
	CC/T/14	Earthquake	30
		Landslide	
		Cyclone	
		Fire	

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Department of Geography

Dumkal College

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
DR PRASENJIT	Ι	CC/T/01	Geomorphology	
MONDAL			Degradation processes	
			Models of landscape evolution	45
			Development of river network and landforms	
			on uniclinal and folded structures	
			Evolution of Landforms	
		CC/P/02	Construction and Interpretation of Relief	40
			Profiles, Average Slope, Relative relief and	
			Stream ordering	
			Transect chart	
			Geological Map	
	II	CC/T/04	Basic Concepts of Surveying and Survey	30
			Equipments	
			Basic Concepts of Surveying and Survey	
			Fauipments	
			Interpretation of Landuse and landcover mans	
		CC/P/04	Survey	
		00/1/04	Determination of Height of Objects using	30
			Transit Theodolite	50
	III	CC/T/05	Condensation	
	111	CC/1/05	Mashaniam of Procinitation	
			Air mass	45
			Fronts	15
			Weather	
			Circulation in the Atmosphere	
			Monsoon Circulation and Mechanism with	
			reference to India	
			Tropical and Mid-latitude Cyclones	
			Climatic Classification	
	IV	CC/T/09	Concept and classification of economic activities	
			Location theories	
			Primary activities	45
			Secondary activities	
			Concept of manufacturing region	
			Tertiary activities	
			Agricultural systems	
			Transnational sea-routes; railways and highways	
			with reference to India	
			Designing a field report	
	V	CC/P/11	Field Work	20
		CC /1/12	Definition and stages of Remote Sensing	60
			Platforms and Sensors	
			Sensor resolutions and their applications with	
			reference to IKS and LANDSAT	
			Aerial Photographs	
			Principles of Image Interpretation	

		GIS data structures	
		Principles of preparing attributes tables, data	
		manipulation and overlay analysis	
		Principles of GNSS positioning and waypoint	
		collection	
	CC/P/12	Georeferencing of map	60
		Digitisation of features	
		Data attachment overlay and preparation of	
		thematic map	
		Preparation of FCC	
		Preparation of LULC map by Supervised Image	
		Classification	
	DSE/T/01	Development of Population Geography	90
		World patterns determinants of population	
		distribution and growth	
		Demographic Transition Model	
		Theories of population growth	
		Population distribution, density and growth	
		profile in India	
		Population Composition and Characteristics	
		Determinate measures of Fertility and Mortality	
		Population Composition of India	
		Migration	
		Concept of Human Development Index	
		Population and development	
		Population policies in Selected Countries	
		Contemporary Issues in Population	
VI	DSE/T/04A	Factors of soil formation	90
V I		Concept of soil profile	20
		Definition and significance of Physical soil	
		properties	
		Definition and significance of Chemical soil	
		properties	
		Soil erosion and degradation	
		Principles of soil classification	
		Concepts of ecology biosphere ecosystem	
		biome, ecotone, community	
		Concept of trophic structure, food chain and	
		food web: Energy flow in ecosystems	
		Geographical extent and characteristic of Bioms	
		Bio-geochemical cycles	
		Deforestation	
		Bio-diversity	
		and an ending	


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Dumkal College

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
SUJAUDDIN	II	CC/T/03	Introduction to Human Geography	
			Evolution of Humans; Concept of Race and	
			Ethnicity; Major Racial Groups of the World	45
			Space, Society and Cultural Regions	
			(Language and Religion)	
			Concept of culture	
	III	CC/T/07	Physical Perspectives of West Bengal	
			Population of West Bengal	
			Resources of West Bengal	
			Regional Development of West Bengal	30
	IV	CC/T/09	Meaning and approaches to Economic	
			Geography	
			Concept in Economic geography	45
			Factors influencing location of economic	
			activity and forces of agglomeration	
			Determining factors of transport costs	
	VI	DSE/T/03	Natural Resources	45
			Approaches to resource utilisation	
			Conservation of Natural Resources	
			Problems of resource depletion	

Dearti Mollah Ho D Department of Geography Dumkai College Basantapur, Murshidabad

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Name of the Teacher	Semester	Paper	Content	No of classes
				allotted
MUSTAQUE	VI	DSE/T/03	Distribution, Utilisation, Problems and	45
RAHAMAN			Management of Metallic Resources	
			Distribution, Utilisation, Problems and	
			Management of Non-Metallic Mineral	
			Resources	
			Problems and Management of Energy	
			Resources	
			Contemporary Energy Crisis and Future	
			Scenario	
			Limits to Growth and Sustainable use of	
			Resources	

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Department of Geography

Dumkal College

Name of the	Semester	Paper	Content	No of
Teacher				classes
				allotted
AMANUL	II	CC/T/03	Evolution of Human Society	
HOQUE			Population Growth and Distribution,	
			Population Composition	45
			Demographic Transition Model	
			Population–Resource Regions	
			Population and Environment Relations with	
			special reference to Development-	
			Environment Conflict	
			Social Morphology and Rural House Types in	
			India	
			Types and Patterns of Rural Settlements	
			Functional Classification of Urban	
			Settlements	
			Trends and Pattern of World Urbanization	
	III	CC/T/07	Physical Features of India	
			Regionalisation of India	
			Climate, Soil and Vegetation	
			Population	60
			Distribution of Population by Race, Caste,	
			Religion, Language, Tribes	
			Agricultural Regions	
			Green Revolution and its Consequences	
			Mineral and Power Resources	
			Industrial Development	
	V	DSE/T/01	Ecological process of urban growth	
		А	City Region	
			Patterns and trends of urbanization in India	45
			Case studies of Delhi, Kolkata with reference	
			to Land use and Urban issues	
			Urban renewal programme - JNNURM	
	VI	CC/T/13	Evolution of Geographical thoughts	45
			Contributions of Humbolt and Ritter	-
			Contributions of Ratzel, Richthofen and	
			Hettner	-
			Schools of Geographical thought	
			I rends of Geography in the post World War-	
			II period Evolution of Geographical thought in India	-
			Quantitative Revolution and its impact	-
			Towards Post Modernism	4
			Towards Post Modernism	-

Acosti Mollah Ho Department of Geography Dumkai College Basantapur, Murshidabad



Name of Teachers

DUMKAL COLLEGE

ESTD 1999 P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

		<u>De</u> Syllabus	partment of Mati	nematics t (2018-2019)			
		HONOURS		1			
1 st Semester	2 nd Semester	2 nd YEAR	3rd YEAR	11 Comenter	GE	NERAL	
		i Analysis II(10)	1 Tenner Al- (10)	1 Semester	2 nd Semester	2 nd YEAR	3rd YEA
CC-1: Unit-1	CC-4: Uint-3 & 4	ii.Classical	ii.statistics	GE-T-01- All		i.Classical Algebra	i.Dynamics

Dr. H. Ali	CC-1: Unit-1 CC-2: Unit-2	CC-4: Uint-3 & 4	ii.Classical Algebra(15)	ii.statistics iii.Rigid Dynamics(20)	GE-T-01: All	I.Classical Algebra II. Vector	i.Dynamics of a Particle(40)
Mr. B. Sarkar	CC-1: Unit-2 CC-2: Unit-3	CC-3: Unit 1	i.L.P.P and Game theory (40) ii.Abstract Algebra(20)	i.Computer Theory & Practical(50+20) ii.Diff. Eqs.(15) iii.Matrix Space(20)		i.Abstract Algebra ii.Linear Algebra ii.L.P.P &	i.Computer(15)
M. Ahmed	CC-1: Unit-4 CC-2: Unit 1	CC-4: Uint-1 & 2	i. Dynamics(50) ii.Linear Algebra(15)	i.Numerical Analysis ii.Hydrostatics iii.statics	8 .	I.Geometry 2D ii.Statistics	i.Numerical Analysis(25)
Ms. L. Pal	CC-1: Unit-3 CC-2: Unit-4	CC-3: Unit 2 & Unit 3	i. Real Analysis I (50)	i.Real Analysis-III II.Complex analysis III.Probability iv.Vector analysis		i.Geometry 3D II.Probability	i.Statics(20)
TOTAL	150	150	200	100			

Basantapur, Murshidabad

Head, Department of mathematics, Dumkal College Comkal, Munhidabad, W.B.

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Department of Mathematics

Syllabus Distribution Chart (2019-2020)

Name of Teachers			HONOURS		1		
	1" Semester	3 rd Semester	5th Semester	3rd YEAR	1 st Semester	3 rd Semester	3rd VEAR
Mr. T. Molla	CC-1: Unit-4 CC-2: Unit-1	CC-5: All CC-7: Practical	DSE-T-02: All	-		GE-H-T-03	-
Dr. H. Ali	CC-1: Unit-1 CC-2: Unit-2	SEC-1: All	CC-12: All	i.Tensor Alg (10) ii.statistics iii.Rigid iv.Dynamics(20)	GE-H-T-01	-	i.Dynamics of a Particle(40)
Mr. S. SK	CC-1: Unit-2 CC-2: Unit-3	CC-7: Theory (All)	DSE-T-01: All	i.Numerical Analysis ii.Hydrostatics iii.statics		*	i.Numerical Analysis(25)
vis. L. Pal	CC-1: Unit-3 CC-2: Unit-4	CC-06: Unit-1, 2	CC-11: All	i.Real Analysis-III ii.Complex analysis iii.Probability iv.Vector analysis			i.Statics(20)
Ar. B. Sarkar		CC-6: Unit- 3, 4 & 5		i.Computer Theory & Practical(50+20) ii.Diff. Eqs.(15) iii.Matrix Space(20)			LComputer(15)
TOTAL	150	300	300	400	75	75	100

Besentapur, Murshidabad

ed. Department of Mathematica, Dumkal College Damkel, Murshidebed, W.B.

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DUMKAL COLLEGE

 BASANTAPUR
 P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406

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Department of Mathematics

Syllabus Distribution (2020-2021)

22000000000	1		HONO	1105					GE/PRO	GRAM		
Name of Teachers	1 st Sem.	2 nd Sem.	3 rd Sem.	4 th Sem.	5 th Sem.	6 th Sem.	1 ^s Sem.	2 nd Sem.	3rd Sem.	4 th Sem.	5 ^m Sem.	6 th Sem
Mr. T. Molla	CC-1: Unit-4 CC-2: Unit-1	CC-3: All	CC-5: All CC-7: Practical	CC-8: All & SEC-T-2A: All	DSE-2A: All	CC-13: All & DSE-3B: All	GE-T-01: All & G-CC-1: All	GE-T- 02: All	GE-T- 01: All	GE-T-02: All & G-CC-4: All	G-DSE- 1A: All	
Dr. H. Ali	CC-1: Unit-1 CC-2: Unit-2	CC-4: Uint-3 & 4	SEC-1: All	CC-10: All	CC-12: All	CC-14: All	•	G-CC- 2: All	G-CC-3: All	-	-	G-DSE 2: All
Mr. S. SK	CC-1: Unit-2 CC-2: Unit-3		CC-7: Theory (All)		DSE-1A: All	-		Ī	-		-	-
Ms. L. Pal	CC-1: Unit-3 CC-2: Unit-4	CC-4: Uint-1 & 2	CC-06: All	CC-9: All	CC-11: All	DSE-4A: All						
TOTAL	150	150	300	300	300	300	75	75	75	75	75	75

Principal Dumkal College Besentapur, Murshidabad

Head Capartment of Mathematics, Dumkai Celego Domkal, Murshidahad, W.B.



DUMKAL COLLEGE

 BASANTAPUR
 P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406

 ESTD 1999
 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

Department of Mathematics

Syllabus Distribution Chart (2021-2022)

Name of		-	HONO	OURS					GE/PRO	GRAM		
Teachers	1" Sem.	2 nd Sem.	3 rd Sem.	4 th Sem.	5 th Sem.	6 th Sem.	1* Sem.	Z nd Sem.	3rd Sem.	4 th Sem.	5 th Sem	.6 th Sem
Mr. T. Molla	CC-1: Unit-1 CC-2: Unit-1	CC-3: All	CC-5: All CC-7: Practical	CC-8: All & SEC-T-2A: All	DSE-2A: All	CC-13: All & DSE-3B: All	GE-T-01: All & G-CC-1: All	GE-T- 02: All	GE-T-01: All	GE-T-02: All & G-CC-4: All	G-DSE- 1A: All	
Dr. H. Ali	CC-1: Unit-2 CC-2: Unit-2	CC-4: Uint- 3 & 4	SEC-1: All CC-6: All	CC-10: All	CC-12: All	CC-14: All	•	G-CC-2: All	G-CC-3: All		-	G-DSE- 2: All
Mr. S. SK	CC-2: Unit-3		CC-7: Theory (All)		DSE-1A: All				-		+	
Ms. L. Pal	CC-1: Unit-3	CC-4: Uint- 1 & 2		CC-9: All	CC-11: All	DSE-4A: All	17 (1823)	-	•	-	-	-
TOTAL	150	150	300	300	300	300	75	75	75	75	75	75

Principal Dumkal Cellege Besantapur, Murshidabad

Head, Department of Mathematics, Dumkal College Domkal, Murshidapad, W.B. 9153549620
Sdumkalcollege@gmail.com



Nome of

DUMKAL COLLEGE

9153549620 ⊠dumkalcollege@gmail.com

P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

Department of Mathematics

Syllabus Distribution Chart (2022-2023)

Teacher	-		_	HONOURS								
reachers	1ª Sem.	2 ^{ne} Sem.	3'd Sem.	4th Sem.	5 th Com	cthe .			GE/PR	OGRAM		
	CC-1: Unit-1	CC-3: Unit-	CC-S: Unit-1	CC-8: Unit-3.4	CC 12 Unit 2	be Sem,	1' Sem.	2 nd Sem.	3rd Sem.	4th Sem.	5 th Sem	6 th Ser
Dr. T. Molla	CC-2: Unit-1	3,4 CC-4: Unit-1	CC-6: Unit-1 CC-7: Unit-4, Practical SEC-T-1: Unit-1	CC-9: Unit-1 CC-10: Unit-1	DSE-1A: Unit 1	CC-13: Unit-3,4 DSE-38: Unit-2	GE-T-01: Unit-1	GE-T- 02: All	GE-T-01: Unit-1	GE-T-02: All	G-DSE-1A: All	
	CC-1: Unit-1	CC-4: Uint-4	CC-5: Uint-4	CC-10: Uint-4	DSE-1A: Uint-2	CC-14: Illet 1	CE 2 01	-				
Dr. H. Ali	CC-2: Unit-2				CC-12: Uint-1	DSE-3B; Unit-1	GE-T-01: Unit-2 & G-CC-1: All	G-CC-2: All	GE-T-01: Unit-2 & G-CC-3:	G-CC-4: All	-	G-DSE-2: All
Invitee-1	CC-2: Unit-2	CC-3: Unit-	CC-5: Unit-2	CC-8: Unit-1 2	CC.11. Ilint 2				All			
		1,2-	SEC-1: Unit-2	CC-9: Unit-2	DSF-24-1lint-2	CC-14: Uint-3						
Invitee-7	CC-1: Unit-3	CC-4: Unit-5	CC-5: Unit-3	SEC-28 AU	CC 11. Was d						-	
0.000.000.000	-		CC-7: Unit-3	SEC-20. All	DSE-2A: Uint-1	CC-13: Uint-1,2			-			
	CC-1: Unit-3	CC-4: Unit-3	CC-06: Unit-3	CC-9: Unit-3.4	(C-11+ Iliet 2.4	DCF 44 US						-
nvitee-3			CC-7: Unit-2,5	CC-10: Unit-2,3	DSE-2A: Uint- 3,4	3 , 4		20		*		
Wall York	CC-2: Unit-1	CC-4: Unit-2	CC-06: Linit-2	CC.0.11=2.2.4								
nvitee-4			CC-7: Unit-1	CC-10: Unit-3,4	CC-12: Uint-3 DSE-1A: Uint-3	DSE-4A: Uint-1	-					
TOTAL	150	150	300	300	200					1	1	
	10			500	2300	300	75	75	75	75	75	-

Princip Dumkai Co Besentapur, Murshidabad

Head, Department of Mathematics, Dumical College Domital, Munshidabed, W.B.

Name of Teacher	Semester	Paper	Content	No. of
		_		Lecture
Dr. Nabin Chandra Maity	Ι	CEMHCC-TH-1	Periodic properties Bohr's model and atomic	7
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			concept Heisenberg's	
			uncertainty principle and its	
			significance	
			Time independent	7
			Schrödinger's wave equation	,
			(without application and	
			solution detail), Significance of	
			ψ and ψ 2, Radial and angular	
			wave functions for hydrogen	
			atom (qualitative idea), radial	
			probability distribution curves,	
			shapes of s, p, d and f orbitals	
			(qualitative idea), Quantum	
			numbers and their significance,	
			Aufbau principle and	
			limitations Hund's rules	
			exchange energy electronic	
			configurations of atoms.	
			Elementary idea of microstates.	
			Acidimetry and alkalimetry	10
Mrs. Saleha	Ι	CEMHCC-TH-1	Inorganic chemistry-I Theory	06
Khatun			Extranuclear structure of atom	
			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept, Heisenberg's	
			significance. Time independent	
			Schrödinger's wave equation	
			(without application and	
			solution detail)	
			Significance of ψ and ψ^2 .	04
			Radial and	
			angular wave functions for	
			hydrogen atom (qualitative	
			idea), radial probability	

			distribution curves, shapes of s,	
			p, d and f orbitals (qualitative	
			idea)	
			Quantum	04
			numbers and their significance	01
			Pauli's exclusion principle	
			Aufhou principle and	
			Autoau principle and	
			limitations, Hund's rules,	
			exchange energy, Electronic	
			configurations of atoms.	
			Elementary idea of microstates	02
		CEMHCC-P-1	Method of Preparation of	02
		Inorganic	standard solutions of titrants	
		Chemistry-IA	Estimation of Carbonate and	02
		practical	hydroxide present together in a	
			mixture	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Dr. Sandip Kumar	Ι	CHEMHT-IA	Kinetic Theory and Gaseous	06
Rajak		Physical	state	
		Chemistry-IA	Kinetic Theory of gases	
			Maxwell's distribution of speed	06
			and energy	
			Real gas and virial equation	06
		CHEMHP_IA	Determination of heat of	02
		Physical	neutralization of a strong acid	02
		Chemistry IA	by a strong base.	
		Chemisu y-IA		
			Determination of heat of solute	02
			ion of oxalic acid from	02
			solubilitymeasurement	
Mr Delwar	Т	CHFMHT-IA	Chemical Thermodynamics-1:	07
Δnsary	1	Physical	Zeroth and 1st law of	07
7 Histi y		Chemistry-IA	Thermodynamics	
		CHEMHT-IA	Chemical Thermodynamics 1	05
		Physical	· Thermochemistry	05
		Γ hysical Γ hemistry-IA	Kinetia Theory and Gaseous	06
		Chemistry-IA	Kinetic Theory and Gaseous	00
			State Vinctia Theory of gases	
M. V. Strain Maria	т		Kinetic Theory of gases	07
Mr. Yasın Nuree	1	CEMHCC-1-2	General Treatment of Reaction	07
		Organic	Mechanism – I	
		Chemistry-1	Mechanistic classification:	
		Theory	Reactive intermediates:	07
			Stereochemistry-I	06
			Bonding geometries of carbon	
			compounds and representation	

			of molecules	
			Concept of chirality and	07
			symmetry:	
		CEMHCC-P-2	Separation	04
		Organic Chemistry-1	Determination of boiling point	04
		Practical	Identification of a Pure Organic	08
			Compound by chemical test	
Mr. Md Muttakin	Ι	CEMHCC-T-2	Bonding and Physical	02
Sarkar		Organic	Properties	
		Chemistry-1	Valence Bond Theory	
		Theory	Electronic displacements	04
			MO theory	04
			Physical properties	03
			Stereochemistry-I	03
			Relative and absolute	
			configuration	
			Optical activity of chiral	04
			compounds	

Dr. Nabin Chandra	II	CHEMHT-3	Acid-Base Concepts and	8
Maity			Solvents	U
Walty			Descritulation of Ambonius	
			Recapitulation of Affinemus	
			concept, Bronsted-Lowry	
			concept, Solvent system	
			concept (in H ₂ O, liq. NH ₃ , liq.	
			SO ₂ and liq. HF), Lux-Flood	
			concept, Lewis concept	
			Drago-Wayland equation,	7
			Solvent levelling and	
			differentiating effects, Relative	
			strength of different acids and	
			bases, Pauling's rules,	
			Hammett acidity function and	
			super acids, HSAB principle	
			and its applications. Acid-base	
			equilibria in aqueous solution	
			pu Duffer Agid bage	
			pri, Bullet, Actu-base	
			neutralization curves and	
			choice of indicators. Gas phase	
			acidity.	
			Quantitative Chemical	10
			Analysis	

			I. Estimation of Fe(II) using $K_2Cr_2O_7$ solution II.	
			Estimation of Fe(III) using	
			$K_2C_{12}O/$ and $K_1V_1IO_4$ solution	
			$KMnO^4$ solution in Estimation	
			$cf Cu^{2+}$ indometrically y	
			Estimation of Cr^{3+} using	
			KaCraOr solution	
Mrs. Salaha	п	СЕМНСС Т 2	R ₂ Cl ₂ O7 solution	06
Wiis. Salella Khotup	11	Inorgania Chamistry	Procipitation reactions	00
Kilatuli		Inorganic Chemisuy-	Qualitativa idaa about	
		ID Theory	Qualitative Idea about	
			comprimentary,	
			noncomplimentary,	
			disproportionation and	
			comproportionation reactions,	
			standard redox potentials with	
			Sign	
			conventions, Electrochemical	
			series and its application to	
			explore the feasibility	
			of reactions and equilibrium	
			N Constants	05
			Nernst equation; effect of pH,	05
			complexation and precipitation	
			on redox potentials, formal	
			potential; Basis of	
			redox titration and redox	
			indicators, Redox potential	
			diagrams (Latimer and	
			Frost) of common elements	
			and their applications.	0.4
			Solubility product principle,	04
			common ion effect and their	
			applications to the	
			precipitation and separation of	
			common metallic ions as	
			hydroxides, sulphides,	
			carbonates, sulphates and	
			halides.	01
		CEMHCC-P-3	Estimation of Fe(II) using	01
		Inorganic Chemistry	K ₂ Cr ₂ O ₇ solution	~ 1
		Practical-IB	Estimation of Fe(III) using	01
			K ₂ Cr ₂ O ₇ Solution	
			Estimation of Cu ²⁺	02
			iodometrycally	

				01
			Estimation of Cr ³⁺ using	
			K ₂ Cr ₂ O ₇ Solution	
Dr. Sandip Kumar	II	CHEMHT-3	Chemical kinetics	05
Rajak		Physical chemistry-IB	Rate law, order and	
U U			molecularity:	
			Chemical kinetics	07
			Role of Temperature and	
			theories of reaction rate:	
			Chemical kinetics	06
			Homogeneous catalysis:	
		CHEMHP-3	Study of kinetics of acid-	04
		Physical chemistry-IB	catalyzed hydrolysis of methyl	0.
			acetate	
			Study of kinetics of	04
			decomposition of H_2O_2	01
Mr. Delwar	П	CHEMHT-3	Chemical Thermodynamics-II:	05
Ansary		Physical chemistry-IB	Second Law	00
1 2000 1			Chemical Thermodynamics-II:	05
			Clausius inequality. Criteria for	00
			spontaneity and equilibrium.	
			Chemical Thermodynamics-II:	02
			Thermodynamic relations:	° -
Mr. Yasin Nuree	II	СЕМНСС-Т-4	Stereochemistry-II	06
		Organic Chemistry-2		
		Theory	Concept of pro-	
		5	stereoisomerism:	04
			Conformation:	06
			Substitution and Elimination	08
			Reactions	
		CEMHCC-P-4	Organic Preparations	18
		Organic Chemistry-2		
		Practical		
Mr. Md Muttakin	II	CEMHCC-T-4	General Treatment of Reaction	02
Sarkar				
		Organic Chemistry-2	Mechanism II	
		Organic Chemistry-2	Mechanism II Reaction thermodynamics	
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and	02
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and bases	02
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerism	02
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerismReaction kinetics	02 04 05
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerismReaction kineticsSubstitutionSubstitution	02 04 05 03
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerismReaction kineticsSubstitution and Elimination Reactions	02 04 05 03
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerismReaction kineticsSubstitution and Elimination Reactions Free-radical substitution	02 04 05 03
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerismReaction kineticsSubstitution and Elimination ReactionsFree-radical reactionsubstitution reaction	02 04 05 03
		Organic Chemistry-2	MechanismIIReaction thermodynamicsConcept of organic acids and basesTautomerismReaction kineticsSubstitution and Elimination ReactionsFree-radical reactionSubstitution reactionNucleophilicSubstitution	02 04 05 03 04

Dr. Sandip Kumar	III	CHEMHT-5	Transport processes	10
Rajak		Physical Chemistry –	Viscosity:	
		II	Transport processes	10
			Conductance and transport	
			number:	
			Foundation of Quantum	04
			Mechanics Beginning of	
			Quantum Mechanics:	
			Foundation of Quantum	06
			Wave function: Mechanics	
			Foundation of Quantum	05
			Mechanics	
			Concept of Operators:	
			Foundation of Quantum	05
			Mechanics	
			Particle in a box:	
		CHEMHP-5	Determination of partition	04
		Physical Chemistry –	coefficient for the distribution	
		II	of I ₂ between water andCCl ₄	
			Determination of K _{eq} for KI	04
			+ I_2 = KI ₃ , using partition	
			coefficient between water	
			and CCl ₄ .	
			Conductometric titration of an	04
			acid (strong, weak/ monobasic,	
			dibasic) againststrong base.	
Mr. Delwar	III	CHEMHT-5	Application of	03
Ansary		Physical Chemistry –	Thermodynamics-I: Partial	
		II	properties and chemical	
			potential:	
			Application of	03
			Thermodynamics-I: Chemical	
			Equilibrium:	
			Application of	03
			Thermodynamics-I:	<u> </u>
			Application of	04
			Thermodynamics-I: Nernst's	
			distribution law;	0.4
			Chemical potential and other	04
			properties of ideal substances-	
			pure and mixtures: Pure ideal	
			gas:	0.2
			Application of	03
			Thermodynamics-I:	

			Condensed Phase	
		CHEMHP-5	Study of viscosity of unknown	04
		Physical Chemistry –	quid (glycerol, sugar) with	
		II	espect to water.	
			Application of	03
			Thermodynamics-I: Partial	
			properties and chemical	
			potential:	
Dr. Nabin Chandra	III	CHEMHT-6	Chemical Bonding–II	14
Maity			Covalent Bond: Lewis	
			structures, formal charge;	
			Qualitative idea of V. B.	
			Theory, directional properties	
			of covalent bond. Concept of	
			Equivalent and non equivalent	
			Hybridization and shapes of	
			simple molecules and ions	
			(examples from main groups)	
			Stereochemically non-rigid	
			molecules Berry's	
			nonceules – Delly s	
			Dipolo momento of inorgania	
			molecules and ions	
			Molecules and folls.	1.4
			v SEPR theory and Bent's fulle	14
			and their applications; M.O.	
			Theory (elementary pictorial	
			approach), concept of bond	
			order, MO diagram of homo-	
			nuclear diatomics (1 st and 2 nd	
			period elements), hetero-	
			nuclear diatomics (HF, CO,	
			NO, NO ⁺ and CN^-) and	
			triatomics (H_2O and BeH_2).	
			Electron sea model and	
			elementary idea about band	
			theory, classification of	
			inorganic solids and their	
			conduction properties	
			according to band theory;	
			Hydrogen bonding:	
			classifications, its effect on the	
			properties of compounds and	
			its importance in biological	
			systems, Vander Waal's	
			forces.	
			Metal extraction and	10
			purification: Basic Metallurgy	
			Idea about ores and minerals,	

			operations involved in	
			metallurgy Flow chart	
			diagram for the extraction of	
			magrain for the extraction of	
			pute 11, N1 and O (including	
			reactions) from their important	
			ores and their uses.	10
		CHEMHP-6	Quantitative inorganic analysis	10
			i. Estimation of Fe(II) and	
			Fe(III) in a given mixture	
			using K ₂ Cr ₂ O ₇ solution ii.	
			Estimation of Fe(III) and	
			Cu(II) in a given mixture using	
			K ₂ Cr ₂ O ₇ solution iii.	
			Estimation of Cr(VI) and	
			Mn(II) in a given mixture	
			using $K_2Cr_2O_7$ solution is	
			Estimation of Eq(III) and	
			Estimation of $Fe(m)$ and $Cr(M)$ is a given minture	
			Cr(vI) In a given inixture	
			using $K_2Cr_2O_7$ solution V.	
			Estimation of Fe(II) and	
			Mn(II) in a given mixture	
			using KMnO ₄ solution vi.	
			Estimation of Fe(III) and	
			Ca(II) in a given mixture using	
			KMnO ₄ solution	
Mrs. Saleha	III	CEMHCC-T-6	Ionic Bond: Lattice energy,	05
Khatun		Inorganic Chemistry-	Born-Lande equation with	
		II Theory	derivation and importance of	
			Kapustinskii expression for	
			lattice energy	
			Born-Haber cycle and	05
			its applications Polarising	05
			no applications, rotatisting	
			power and polarisability of	
			ions, rajan's rules and its	
			applications	0.5
			radius ratio rules – its	05
			applications and limitations,	
			salvation energy	
			and solubility energetics of	
			dissolution process;	
			Packing in crystals, voids in	05
			crystal lattice. packing	
			efficiency. Structure of ionic	
			solids rock salt zinc blende	
			wurtzite fluorite antifluorite	
			warding, maonic, anumaonic,	
			perovekite and lover lattice	
			perovskite and layer lattice.	02

			stoichiometric and non-	
			stoichiometric crystal defects.	
		CEMHCC-P-6	Estimation of Fe(II) and	02
		Inorganic Chemistry-	Fe(III) in a given mixture	
		II Practical	using $K_2Cr_2O_7$ solution	
			Estimation of Cu(II) and	02
			Fe(III) in a given mixture	-
			using $K_2Cr_2O_7$ solution	
			Estimation of Cr(VI) and	02
			Fe(III) in a given mixture	-
			using K ₂ Cr ₂ O ₇ solution	
			Estimation of Ca(II) and	02
			Fe(III) in a given mixture	
			using K_2Cr_2O7 solution	
Mr. Yasin Nuree	III	CEMHCC-T-7	Carbonyl and Related	09
		Organic Chemistry-3	Compounds	
		Theory	Addition to C=O	
			Exploitation of acidity of α -H	08
			of C=O	
			Elementary ideas of Green	03
			Chemistry	
			Nucleophilic addition to α , β -	03
			unsaturated carbonyl system:	
			Nucleophilic addition to α , β -	
			unsaturated carbonyl system:	
			Substitution at sp2 carbon	03
			(C=O system)	
		CEMHCC-P-7	Qualitative Organic Analysis	16
		Organic Chemistry-3	of single solid organic	
		Practical	compound	
Mr. Md Muttakin	III	CEMHCC-T-7	Chemistry of alkenes and	06
Sarkar		Organic Chemistry-3	alkynes	
		Theory	Addition to C=C	
			Addition to $C=C$ (in	04
			comparison to C=C)	
		CEMHCC-P-7	Aromatic Substitution	04
		Organic Chemistry-3	Electrophilic aromatic	
		Practical	substitution	
			Organo-metallics	04
			Free-radical substitution	
			Reaction	
Mr. Yasin Nuree	III	SEC-1B	Introduction	04
		Basic Analytical		
		Chemistry	Complexometry	02
			Soil Analysis	02

Analysis of water	03
Analysis of food products	03
Chromatography	03
Ion-exchange	02
Analysis of cosmetics	03
Suggested Applications (Any one)	02
Suggested Instrumental	03
demonstrations	

Dr. Sandip Kumar	IV	CHEMHT-8	Application of	08
Rajak		Physical Chemistry-	Thermodynamics – II:	
		III	Colligative properties:	
			Application of	06
			Thermodynamics – II: Phase	
			rule:	
			Application of	06
			Thermodynamics – II: Binary	
			solutions:	
			Quantum Chemistry	06
			Angular momentum:	
			Quantum Chemistry	08
			Qualitative treatment of	
			hydrogen atom and hydrogen-	
			like ions	
			Quantum Chemistry	06
			LCAO and HF-SCF:	
		CHEMHP-8	Determination of solubility of	02
		Physical Chemistry -	sparingly soluble salt in water,	
		II	in electrolyte. with common	
			(using common indicator)	
			pH-metric titration of acid	02
			(mono-and di-basic) against	02
			strong base	
			Determination of K for AgCl	02
			by potentiometric titration of	02
			$A g N \Omega_{2}$ solution against	
			standard KCl solution	
Mr Delwar	IV	CHEMHT-8	Electrical Properties of	08
Ansary	ΤV	Physical Chemistry_	molecules.	00
1 militar y		III	Ionic equilibria	
		CHEMHP-8	Electrical Properties of	06

		Physical Chemistry –	molecules:	
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			stability, n/p ratio and different	
			modes of decay, mass defect,	
			packing fraction and nuclear	
			binding energy. Nuclear forces:	
			Meson exchange theory,	
			elementary idea of nuclear	
			shell model and magic	
			numbers. Fission, fusion and	
			spallation reactions, artificial	
			radioactivity, super heavy	
			elements and their IUPAC	
			nomenclature. Moderators.	
			slow and fast neutrons.	
			Applications of radio-isotopes	
			in: determination of structures.	
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			Diagonal relationshin (Li-Mo	
			B-Si) and anomalous behavior	
			of first member of each group	
			Allotropy and catenation	
			(examples of C, P and S	

			compounds). Study of the	
			following compounds with	
			emphasis on preparation,	
			properties, structure and	
			bonding: Berylium hydrides	
			and halides; diborane;	
			borazine; boron nitride, boric	
			acid, borax, fluorocarbons	
			(with environmental effect);	
			oxides and oxyacids of	
			nitrogen, phosphorous, sulphur	
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			Comparison among the	
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			and E^{0} values; General	
			comparison between 3d, 4d	
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			spectrochemical series of ligands.	
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		Green Chemistry	Cnemistry	07
		Theory	Prevention/ minimization of	05

			hazardous/ toxic products	
			Energy requirements for	05
			reactions – alternative sources	
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			Chemistry	
			Oxidation reagents and	
			catalysts	
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		Green Chemistry		
		Practical		
Mr. Md. Muttakin	V	CEMHDSE-T-2C	Green Chemistry	05
Sarkar		Green Chemistry	Introduction to Green	
			Chemistry	
			Examples of Green Synthesis/	10
			Reactions and some real-	
			World cases	
		CEMHDSE-T-2C	Green Chemistry Practical	05
		Green Chemistry		
		Theory		

Dr. Nabin	VI	CHEMHT-13	Bio-inorganic Chemistry	25
Chandra Maity			Essential elements of life, Role of	
			metal ions in living systems- a brief	
			review, Elementary idea about	
			proteins, enzymes and ionophores;	
			Structure of ATP, Na ⁺ ion pump and	
			transport of Na ⁺ and K ⁺ across cell	
			membrane; active site structures and	
			bio-functions of haemoglobin,	
			myoglobin, carboxy peptidase A,	
			carbonic anhydrase B, cytochrome c,	
			ferredoxins and chlorophyll;	
			biological nitrogen fixation; toxic	
			metals (Pb, Cd and Hg) and their	
			effects, Wilson disease, chelation	
			therapy; platinum and gold complexes	
			as drugs (examples only).	
			Organometallic chemistry and	25

			catalysis	
			Definition. Classification of	
			organometallic compounds, hapticity	
			of ligands, nomenclature, 16- electron	
			& 18-electron rule and its	
			applications: preparation and structure	
			of mono- and bi-nuclear carbonyls of	
			3d series synergic effect of CO and	
			use of IP data to explain extent of	
			use of its data to explain extent of	
			back boliding, General methods of preparation of matel early π handed	
			preparation of metal-carbon o-bonded	
			complexes, Zeise's sait, Metal-carbon	
			multiple bonding; Preparation,	
			structures, properties and reactions of	
			ferrocene; elementary idea about	
			oxidative addition, reductive	
			elimination, insertion reactions; Study	
			of the following catalytic processes:	
			alkene hydrogenation (Wilkinson's	
			catalyst), hydroformylation, Wacker	
			process, Synthetic gasoline (Fischer	
			Tropsch reaction) and Olefin	
			polymerization reaction (Ziegler-	
			Natta catalyst)	
		CHEMHP-13	Qualitative semimicro analysis	10
Mrs. Saleha	VI	CHEMHP-13 CEMHCC-T-	Qualitative semimicro analysis Symmetry as a universal theme,	10 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13	Qualitative seminicro analysis Symmetry as a universal theme, concept of symmetry elements and	<u>10</u> 02
Mrs. Saleha Khatun	VI	<u>CHEMHP-13</u> CEMHCC-T- 13	Qualitative seminicro analysis Symmetry as a universal theme, concept of symmetry elements and operations	<u> 10</u> 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular	Qualitative seminicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples);	<u>10</u> 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic	10 02 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative seminicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d);	10 02 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative seminicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d);identification of molecular point	10 02 02 02 04
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative seminicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules	10 02 02 04
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative semimicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions;	10 02 02 04
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative semimicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity	10 02 02 04 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative seminicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality.	10 02 02 04 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality.Essential elements of life Role of	10 02 02 04 02 02 02 02
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief	10 02 02 04 02 04 02 04 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality. Essential elements of life, Role of metal ions in living systems- a brief review	10 02 02 04 02 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins	10 02 02 04 02 04 02 04
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionorbores: Structure of	10 02 02 04 02 04 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d);identification of molecular point groups in some simple molecules and ions;applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP Na+	10 02 02 04 02 04 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d);identification of molecular point groups in some simple molecules and ions;applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP, Na+ ion nump and transport of Na+ and	10 02 02 04 02 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP, Na+ ion pump and transport of Na+ and K + across cell membrane;	10 02 02 04 02 04 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d);identification of molecular point groups in some simple molecules and ions;applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP, Na+ ion pump and transport of Na+ and K+ across cell membrane; active site	10 02 02 04 02 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysis Symmetry as a universal theme, concept of symmetry elements and operations (with examples); symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions; applications of symmetry for polarity and chirality. Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP, Na+ ion pump and transport of Na+ and K+ across cell membrane; active site atruetures and big functions of	10 02 02 04 02 02 06 06
Mrs. Saleha Khatun	VI	CHEMHP-13 CEMHCC-T- 13 Molecular Symmetry and Point group Bio-inorganic Chemistry	Qualitative semimicro analysisSymmetry as a universal theme, concept of symmetry elements and operations (with examples);symmetry properties of atomic orbitals (s, p and d); identification of molecular point groups in some simple molecules and ions;applications of symmetry for polarity and chirality.Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP, Na+ ion pump and transport of Na+ and K+ across cell membrane; active site structures and bio-functions of	10 02 02 04 02 04 02 04 02 03

			carboxy peptidase A,	06
			carbonic anhydrase B, cytochrome c,	
			ferredoxins and chlorophyll;	
			biological	
			nitrogen fixation;	
			toxic metals (Pb, Cd and Hg) and	04
			their effects, Wilson disease,	
			chelation therapy; platinum and gold	04
			complexes as drugs (examples only)	
		CEMHCC-P-	Qualitative semimicro analysis of	06
		13	mixtures containing four radicals	
		Qualitative	(excluding oxide and	
		semimicro	carbonate). Emphasis should be given	
		analysis	to the understanding of the chemistry	
		-	of different	
			reactions and to assign the most	
			probable composition.	
			Basic Radicals: K^+ , NH4 ⁺ , Mg ^{2+,}	
			Ca^{2+} , Ba^{2+} , Sr^{2+} , Al^{3+} , Cr^{3+} , Mn^{2+} ,	
			$Fe^{3+}/Fe^{2+}, Co^{2+}, Ni^{2+},$	
			Cu^{2+} , Zn^{2+} , Pb^{2+} , Cd^{2+} , Bi^{3+} , Sn^{2+} /	
			Sn^{4+} , As^{3+}/As^{5+} , Sb^{3+}/Sb^{5+}	
			Acid Radicals: Cl^- , Br^- , I^- , S^{2-} , SO_4^{2-} ,	02
			$S_2O_3^{2-}$, SCN ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , BO ₃ ³⁻ ,	
			PO_4^{3-} , As O_4^{3-} and	
			H ₃ BO ₃	
			Insoluble Materials: $Cr_2O_3(ig)$,	03
			$Fe_2O_3(ig)$, Al_2O_3 , SnO_2 , $PbSO_4$,	
			BaSO ₄ , SrSO ₄	
Mr. Yasin Nuree	VI	CEMHCC-T-	Carbocycles and Heterocycles	06
		14	Polynuclear hydrocarbons and their	
		Organic	derivatives	
		Chemistry-4 Theory	Heterocyclic compounds	04
			Synthesis (including retrosynthetic	04
			approach and mechanistic details)	
			Pyridine	06
			Cyclic Stereochemistry	06
			Alicyclic compounds	
		CHEMHCC-P-	Chromatographic Separations	08
			Spectroscopic Analysis of Organic	06
		Organic Chamiatar 4	Compounds	
		Dreatical		
	1 7 1		Deriovalia reactions	02
IVIT. IVIU IVIUTTAKIN Sarkar	V I	14	Mechanism storeochomistry	03
JaiKai	1	14		

		Organic	regioselectivity in case of	
		Chemistry-4	Electrocyclic reactions	
		Theory	Cycloaddition reactions	02
			Sigmatropic reactions	02
		CHEMHCC-P-	Carbohydrates Monosaccharides,	05
		14	disaccharides, polysaccharides	
			Biomolecules	05
			Amino acids, peptides	
			Chromatographic Separations	05
Dr. Sandip Kumar	VI	CHEMHTDSE	Statistical Thermodynamics	06
Rajak		-3 Advanced	Configuration:	
		Physical	Statistical Thermodynamics	06
		Chemistry	Boltzmann distribution:	
			Statistical Thermodynamics	06
			Partition function:	
			Special selected topics	07
			Specific heat of solid:	
			Special selected topics	07
			3rd law:	~ -
			Special selected topics	07
			Polymers	0.0
		CHEMHTDSE	Roots of equations: (e.g. volume of	02
		-3 Advanced	van der Waals gas and comparison	
		Physical	Withideal gas, pH of a weak acid).	02
		Chemistry	change in pressure for small	02
			change in volume of a van der	
			Waals gas, potentiometric titrations).	
			Numerical integration (e.g. entropy/	02
			enthalpy changes from heat	
			capacity data), probability	
			distributions (gas kinetic theory)	
			and mean values.	
Mr. Delwar	VI	CHEMHTDSE	Crystal Structure: Bravais Lattice and	08
Ansary		-3 Advanced	Laws of Crystallography:	
		Physical	Crystal Structure: Crystal planes:	06
		Chemistry	Crystal Structure: Determination of	06
			crystal structure	
Mrs. Saleha	Ι	CHEM-MAT-1	Atomic Structure:	6
Khatun	(NEP)	inorganic-1A	Bohr' s model and atomic spectrum	
			of hydrogen	
			Time independent Schrodinger' s	6
			wave equation (without application	
			and solution detail),	
			Pauli' s exclusion principle, aufbau	4
			principle and limitations	
Dr Nabin Chandra	Ι	CHEM-MAT-1	Periodic properties	4

Maity	(NEP)	inorganic-1A	Modern IUPAC periodic table and	
	(/	8	classification of elements in the table	
			Atomic radii. Ionic radii and	5
			Pauling' s method for	-
			determining univalent ionic radii	
			Electron affinity and factors	5
			influencing these	U
			properties	
Dr. Sandip Kumar	Ι		Kinetic Theory and Gaseous state	6
Rajak	(NEP)		Kinetic Theory of gases	
5			Maxwell's distribution of speed and	6
			energy:	
			Real gas and virial equation:	6
		Physical-1A	Chemical Thermodynamics – I	6
		5	Zeroth and 1st law of	
			Thermodynamics	
			Thermochemistry:	6
Yasin Nuree	Ι	CHEM-MDC-1	Food additives	6
	(NEP)		Vitamins	4
			Drugs	8
Dr Nabin Chandra	Ι	CHEM-MDC-1	Fats and Oil	8
Maity	(NEP)		Soaps and detergents	6
			Pesticides	7
			Glass Ceramics	6
Yasin Nuree	Ι	CHEM-SEC-1	Pharmaceutical Chemistry	6
	(NEP)		Basic concepts of drug discovery,	
			design and development	
			Synthesis of the representative drugs	6
			of the following classes	
			antiviral agents	6
			Central Nervous System agents	4
			Cardiovascular	2
			HIV-AIDS related drugs	3
			Fermentation:	5
			Aerobic and anaerobic fermentation	
			Production of (i) Ethyl alcohol and	5
			citric acid, (ii)	
			Antibiotics; Penicillin, Cephalosporin,	
			Chloromycetin and Streptomycin	
			Hands On Practical:	4
			Preparation of Aspirin and its	
			analysis.	
			Preparation of magnesium bisilicate	4
			(Antacid).	

Name of Teacher	Semester	Paper	Content	No. of
Saleha Khatun	T	CHEMG_T_01	Atomic Structure	
Salena Khatan	1		Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	I (NEP)	CHEM-MIT- 1A (Minor-1)	Acids and bases Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents	03
			Acids and bases Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.	03
			Acids and basesHard and soft acids and bases(HSABconcept),applicationsofHSABprocess.	02
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
		CHEM-MIP- 1A (Minor-1)	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic Chemistry 1.Electronic displacements	05
			2.Stereochemistry	05
			3. Nucleophilic Substitution and Elimination Reactions	04
		CHEMGP-1	Qualitative Analysis of Single	05

2023-2024				
		Organic	Solid Organic Compound(s)	
		Chemistry -1		

Saleha Khatun	II	CHEMG-T-02	Chemical Bonding and Molecular structure:	06
			a) Ionic Bonding	
			b) Covalent Bonding	07
			c) MO Approach	07
			Comparative study of p-block elements:	04
			a) Group trends in electronic configuration, modification of pure elements	
			b) Common oxidation states, inert pair effect, and their important compounds in respect of the following groups	04
			of elements i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	
			iii. N-P-As-Sb-Bi	02
			iv. O-S-Se-Te	
			v. F-Cl-Br-I	
		CHEMG-P-02	Qualitative semi-micro analysis of mixtures containing three radicals. Emphasis should be given to the understanding of the chemistry of different reactions. Acid Radicals: Cl ⁻ , Br ⁻ , I ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , S ²⁻ , SO ₄ ²⁻ , BO ₃ ^{3-,} H ₃ BO ₃ .	03
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , Sr ²⁺ , Ba ²⁺ , Cr ³⁺ , Mn ²⁺ , Fe ³⁺ , Ni ²⁺ , Cu ²⁺ , NH ₄ ⁺ .	02
Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and Real gases	12
			Liquids	05
		CHEMG-P-02	Surface tension measurement (use of organic solvents excluded)	02

			Viscosity measurement (use of organic solvents excluded)	02
Md Muttakin	II	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent and	
			solvent, differentiating and	
			levelling solvents.	
			Acids and bases	03
			Lewis acid-base concept,	
			classification of Lewis acids	
			and bases, Lux-Flood concept	
			and solvent system concept.	
			Acids and bases	02
			Hard and soft acids and bases	
			(HSAB concept),	
			applications of HSAB	
			process.	
			Aliphatic Hydrocarbons	02
			Introduction	
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Allowneed (ver to 5 Corborne)	02
			Alkynes: (up to 5 Carbons).	03
		CHEMC D 01	Estimation of ovalic acid by	02
		CITEIVIO-F-01	titrating it with $KMnO_4$	02
			attaing it with filmo4.	
			Estimation of Cu (II) ions	02
			iodometrically using Na ₂ S ₂ O ₃ .	-
Saleha Khatun	III	CHEMG-T-01	Atomic Structure	09
~			Chemical Periodicity	09
			Redox Reactions	04
				01
			Estimation of Fe(II) ions with	01

		CHEMG-P-01	$K_2Cr_2O_7$	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Md Muttakin	III	CHEMG-T-01	Fundamentals of Organic	05
Sarkar			Chemistry	
			1.Electronic displacements	
			2.Stereochemistry	05
			3. Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic Chemistry -1	Solid Organic Compound(s)	

Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and Real gases	12
			Liquids	05
			Surface tension measurement (use of organic solvents excluded)	02
		CHEMG-P-02	Viscosity measurement (use of organic solvents excluded)	02
Saleha Khatun	IV	CHEMG-T-02	Chemical Bonding and Molecular structure: d) Ionic Bonding	06
			Covalent Bonding	07
			MO Approach	07
			Comparative study of p-block elements:	04
			a) Group trends in electronic configuration, modification of pure elements,	
			 b) Common oxidation states, inert pair effect, and their important compounds in respect of the following groups of elements i. B-Al-Ga-In-Tl ii. C-Si-Ge-Sn-Pb 	04
			iii. N-P-As-Sb-Bi iv. O-S-Se-Te v. F-Cl-Br-I	02
		CHEMG-P-02	Qualitative semi-micro analysis of mixtures containing three radicals. Emphasis	03

	2023-2024					
			should be given to the understanding of the chemistry of different			
			reactions. Acid Radicals: Cl ⁻ Br ⁻ I ⁻ NO ⁻			
			, NO_3^- , S^{2-} , SO_4^{2-} , BO_3^{3-} ,			
			H ₃ BU ₃ .			
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , Sr ²⁺ Ba ²⁺ Cr ³⁺ , Mn ²⁺ Fe ³⁺	02		
			$Ni^{2+}, Cu^{2+}, NH_4^+.$			
Md Muttakin	IV	CHEMG-T-02	Solids	05		
Sarkar			Chemical kinetics	05		
		CHEMG-P-02	Viscosity measurement (use of	02		
		Physical Chemistry – I	organic solvents excluded)			

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	Ι	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent	
			and solvent, differentiating and	
			Acids and bases	02
			Lewis acid-base concept	03
			classification of Lewis acids	
			and bases Lux-Flood concept	
			and solvent system concept	
			Acids and bases	02
			Hard and softacids and bases	02
			(HSAB concept), applications	
			of HSAB process.	
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to5 Carbons)	03
			Alkenes:(upto5 Carbons).	04
			Alkynes:(upto5 Carbons)	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu(II)ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic	05
			Chemistry	
			Electronic displacements	
			Stereochemistry	05
			Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic	Solid Organic Compound(s)	05
		Chemistry -1		
Molecular structure:a)Ionic Bondingb)Covalent Bonding07	,			
--	---			
a)Ionic Bondingb)Covalent Bonding07	,			
b) Covalent Bonding 07	,			
c) MO Approach 07				
Comparative study of p-block 04	•			
elements:				
a) Group trends in electronic				
configuration, modification of				
pure elements,				
b) Common oxidation states, 04				
inert pair effect, and their				
important compounds in				
respect of the following groups				
of elements				
i. B-Al-Ga-In-Tl				
ii. C-Si-Ge-Sn-Pb				
iii. N-P-As-Sb-Bi 02				
iv. O-S-Se-Te				
v. F-Cl-Br-I				
CHEMG-P-02 Qualitative semi-micro 03				
analysis of mixtures				
containing three radicals.				
Emphasis should be given				
to the understanding of the				
chemistry of different				
reactions. Acid Radicals: Cl ² ,				
$Br^{2}, \Gamma, NO_{2}^{2}, NO_{3}^{2}, S^{2}, SO_{4}^{2},$				
$BO_3^{3,7}$ H ₃ BO ₃ .				
Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , 02				
Sr^{2} , Ba^{2} , Cr^{3} , Mn^{2} , Fe^{3} ,				
$N1^{2+}, C1^{2+}, NH4^{2+}.$				
Delwar Ansary II CHEMG-1-02 Kinetic Theory of Gases and 12				
Real gases				
Liquids 05				
CHEMG-P-02 Surface tension measurement 02 (use of organic solvents				
excluded)				
Viscosity measurement (use of 02	,			
organic solvents excluded)				
MdMuttakin II CHFMG-T-02 Solids 05				
Sarkar Chemical kinetics 05				
CHEMG-P-02 Viscosity measurement (use of 02				
$\begin{array}{c} \text{Charlies 1 62} \\ \text{Physical Chemistry} = I \\ \text{organic solvents excluded} \end{array}$,			

Nabin Chandra			Ionic Equilibria	09
Maity	Ш	CHEMG-T-03	Aryl Halides	04
	111	CHEMG-P-03	Determination of enthalpy of hydration of copper sulphate	02
	III	CHEMG-T-03	Chemical Energetics	12
Delwar Ansary			Carbonyl Compounds	07
		CHEMG-P-03	Determination of heat capacity of calorimeter for different volumes	02
			Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	02
Saleha Khatun	III	CHEMG-T-03	Chemical Equilibrium	09
			Alcohols, Phenols and Ethers	08
		CHEMG-P-03	Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH meter and compare it with the indicator method	02
			Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) a. Sodium acetate-acetic acid b. Ammonium chloride- ammonium hydroxide	02
Md Muttakin	III	CHEMG-T-03	Aromatic hydrocarbons	06
Sarkar			Organometallic compounds	04
		CHEMGP-3 Organic Chemistry -1	Identification of a pure organic compound	04

Nabin Chandra		CHEMG-T-04		10
Maity	IV		Coordination Chemistry	
			Crystal Field Theory	10
		CHEMG-P-04	Complexometric estimation	02
			of (i) Mg2+ or (ii) Zn2+	
			using EDTA.	
			Preparation of any two of	01
			the following complexes:	
			a.tetraammine	

			carbonatocobalt (III) nitrate	
Delwar Ansary	IV	CHEMG-T-04	Phase Equilibrium	07
		CHEMG-P-04	Study of the equilibrium of one of the following reactions by the distribution method: $I_2(aq) +I^-(aq) = I^-$ (aq)	02
			Perform the following potentiometric titrations: Weak acid vs. strong base	02
			Potassium dichromate. Mohr's salt	02
Saleha Khatun	IV	CHEMG-T-04	Conductance	08
			Transition Elements (3d Series)	10
		CHEMG-P-04	Preparation of any two of the following complexes: b. tetraamminecopper(II) sulphate	01
			c. potassium trioxalatochromate(III) trihydrate	01
			d. potassium bisoxalatocuprate(II) trihydrate	01
Md Muttakin	IV	CHEMG-T-04	Solutions	05
Sarkar			Electromotive force	05
		CHEMG-P-4	conductometric titrations:	02
			Strong acid vs. strong base	
Nabin Chandra	V	CHEMGTDSE-1	Chemical Analysis	14
Maity		CHEMGPDSE-1	To find the total hardness of water by EDTA titration	02
			Determination of the strength of the H2O2 sample	02
Delwar Ansary	V	CHEMGTDSE-1	Error Analysis and Computer Applications	12
		CHEMGPDSE-1	To determine the rate constant for the acid catalysed hydrolysis of an ester.	02

			TitrationofHClandCH ₃ CO	02
			OHmixturevsNaOHusingt	
			wodifferentindicatorstofin	
			dtheconcentration.	
Saleha Khatun	V	CHEMGTDSE-1	Industrial Chemistry	18
		CHEMGPDSE-1	Titration of Na2CO3 and	02
			NaHCO3 mixture vs HCl	
			using phenolphthalein and	
			methyl orange	
			indicators	
Md Muttakin	V	CHEMGTDSE-1	Environmental Chemistry	16
Sarkar		CHEMGPDSE-1	Estimation of available	02
~			oxygen in pyrolusite	°-
Nabin Chandra	VI	CHEMGTDSE-2	Polymers	04
Maity	• 1	CHEMICIDDE 2	Paints	03
Wally			Varnishes	03
			Fats and Oils	02
		CHEMCDDSE 2	Durification of the and	03
		CHEMOPDSE-2	product is to be made by	02
			arrustallisation from	
			uster/slashal	
			Water/alconor	02
			Estimation of	02
			saponification value of oil	
Dalaan Awaaa	171	CHEMCTDRE 2	/ ester / fat.	10
Delwar Ansary	V I	CHEMGIDSE-2	Amines and Diazonium Salts	10
			Amino Acids and	10
			Carbohydrates	10
		CHEMGPDSE-2	Hydrolysis of	02
		CHEMOLDGE 2	amides/imides	02
			A cetylation of aromatic	02
			amines	02
Saleha Khatun	VI	CHEMGTDSE-2	Synthetic dyes	02
Sulena Matan	• 1	CHEMICIDDE 2	Drugs and	03
			Phermaceuticals	05
			Pesticides	03
			Fermentation Chemicals	03
		CHEMCPDSE 2	Estimation of acetic acid in	01
		CHEWIOI DSE-2	commercial vinegar	01
			Estimation of amino acid	02
			by formal titration	02
Md Muttakin	VI	CHEMGTDSE 2	Carboxylic Acids and	06
Sarkar	V I	CHEWICIDSE-2	Their	00
Jaikai			Derivatives	
			Industrial Chamister	02
			Food additives	02
		CHEMCPDSE 2	Nitration of aromatic	02
		CHEMOPDSE-2	aompounda	02
			compounds	

	Purification of the crude	01
	product is to be made by	
	crystallization from	
	water/alcohol.	

Name of Teacher	Semester	Paper	Content	No. of
		-		Lecture
Dr. Nabin Chandra	Ι	CEMHCC-TH-1	Periodic properties	7
Maity			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept. Heisenberg's	
			uncertainty principle and its	
			significance	
			Time independent	7
			Schrödinger's wave equation	/
			(without application and	
			(without application and	
			w and w? Radial and angular	
			ψ and $\psi 2$, Radial and angular	
			wave functions for hydrogen	
			atom (qualitative idea), radial	
			probability distribution curves,	
			shapes of s, p, d and f orbitals	
			(qualitative idea), Quantum	
			numbers and their significance,	
			Pauli's exclusion principle,	
			Aufbau principle and	
			limitations, Hund's rules,	
			exchange energy, electronic	
			configurations of atoms.	
			Elementary idea of microstates.	
			Acidimetry and alkalimetry	10
Mrs. Saleha	Ι	CEMHCC-TH-1	Inorganic chemistry-I Theory	06
Khatun			Extranuclear structure of atom	
			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept, Heisenberg's	
			uncertainty principle and its	
			significance, Time independent	
			Schrödinger's wave equation	
			(without application and	
			solution detail)	
			Significance of w and w?	04
			Radial and ψ^2 ,	. ·
			angular wave functions for	
			hydrogen atom (qualitative	
			idea), radial probability	

			distribution curves, shapes of s,	
			p, d and f orbitals (qualitative	
			idea)	
			Quantum	04
			numbers and their significance	01
			Pauli's exclusion principle	
			Aufhau principle and	
			Autoau principie and	
			limitations, Hund's rules,	
			exchange energy, Electronic	
			configurations of atoms.	
			Elementary idea of microstates	02
		CEMHCC-P-1	Method of Preparation of	02
		Inorganic	standard solutions of titrants	
		Chemistry-IA	Estimation of Carbonate and	02
		practical	hydroxide present together in a	
		•	mixture	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Dr. Sandin Kumar	Т	CHFMHT-IA	Kinetic Theory and Gaseous	06
Di. Sanaip Kuma Rajak	1	Physical	state	00
Кајак		Chemistry IA	Kinetic Theory of gases	
		Chemisu y-IA	Manuall's distribution of anord	06
			maxwell's distribution of speed	00
			and energy	07
			Real gas and virial equation	06
		CHEMHP-IA	Determination of heat of	02
		Physical	neutralization of a strong acid	
		Chemistry-IA	by a strong base.	
				00
			Determination of heat of solute	02
			ion of oxalic acid from	
	_	~~~~~~	solubilitymeasurement	
Mr. Delwar	I	CHEMHT-IA	Chemical Thermodynamics-1:	07
Ansary		Physical	Zeroth and 1st law of	
		Chemistry-IA	Thermodynamics	
		CHEMHT-IA	Chemical Thermodynamics-1	05
		Physical	: Thermochemistry	
		Chemistry-IA	Kinetic Theory and Gaseous	06
			state	
			Kinetic Theory of gases	
Mr. Yasin Nuree	Ι	CEMHCC-T-2	General Treatment of Reaction	07
		Organic	Mechanism – I	
		Chemistry-1	Mechanistic classification:	
		Theory	Reactive intermediates:	07
		,	Stereochemistry-I	06
			Bonding geometries of carbon	00
			compounds and representation	
	1	1	compounds and representation	

			of molecules	
			Concept of chirality and	07
			symmetry:	
		CEMHCC-P-2	Separation	04
		Chemistry-1	Determination of boiling point	04
		Practical	Identification of a Pure Organic	08
			Compound by chemical test	
Mr. Md Muttakin	Ι	CEMHCC-T-2	Bonding and Physical	02
Sarkar		Organic	Properties	
		Chemistry-1 Theory	Valence Bond Theory	
			Electronic displacements	04
			MO theory	04
			Physical properties	03
			Stereochemistry-I	03
			Relative and absolute	
			configuration	
			Optical activity of chiral	04
			compounds	

Dr. Nabin Chandra	II	CHEMHT-3	Acid-Base Concepts and	8
Maity			Solvents	-
			Recapitulation of Arrhenius	
			concept. Bronsted-Lowry	
			concept. Solvent system	
			concept (in H_2O , lia, NH_3 , lia,	
			SO_2 and liq. HF). Lux-Flood	
			concept. Lewis concept	
			Drago-Wayland equation.	7
			Solvent levelling and	
			differentiating effects, Relative	
			strength of different acids and	
			bases, Pauling's rules,	
			Hammett acidity function and	
			super acids, HSAB principle	
			and its applications, Acid-base	
			equilibria in aqueous solution,	
			pH, Buffer, Acid-base	
			neutralization curves and	
			choice of indicators. Gas phase	
			acidity.	
			Quantitative Chemical	10
			Analysis	

Mrs. Saleha II CEMHCC-T-3 Redox reactions and precipitation of Cr ²⁺ using K2Cr:O7 solution 06 Mrs. Saleha II CEMHCC-T-3 Redox reactions and Precipitation reactions Qualitative idea about complimentary, noncomplimentary, noncomplimentary, disproportionation and comproportionation reactions, standard redox potential with sign conventions, Electrochemical series and its application to explore the feasibility of reactions and equilibrium constants 05 Nerst equation; effect of pH, complexation and precipitation and precipitation on redox potential, formal potential; Basis of redox potential diagrams (Latimer and Frost) of common clements and their applications to the precipitation and separation of common ion effect and their applications to the precipitation and separation of common ion effect, subplices, carbonates, sulphates and halides, carbonates, sulphates and halides, carbonates, sulphates and halides. 04 CEMHCC-P-3 Estimation of Fe(II) using 01 01 K2Cr2O7 solution Estimation of Cu ²⁺ 02				I. Estimation of Fe(II) using $K_2Cr_2O_7$ solution II.	
Mrs. Saleha II CEMHCC-T-3 Estimation of Ca ²¹ using KMnO ⁴ solution iv. Estimation of Ca ²⁴ iodometrically v. Estimation iodometrically v. Estimation of Ca ²⁴ iodometrically v. Estimation of Ca ²⁴ iodometrically v. Estimation iodometrically				$K_2Cr_2O_7$ and $KMnO_4$ solution	
Mrs. Saleha II CEMHCC-T-3 Inorganic Chemistry- IB Theory Redox reactions and Precipitation reactions Qualitative idea about complimentary, noncomplimentary, disproportionation and comproportionation reactions, standard redox potentials with sign conventions, Electrochemical series and its application to explore the feasibility of reactions and equilibrium constants 06 Nernst equation; effect of pH, complexation and precipitation on redox potentials, formal potential; Basis of redox titration and redox indicators, Redox potential diagrams (Latimer and Frost) of common elements and their applications. 06 Solubility product principle, common ion effect and their applications to the precipitation and separation of common ion effect and their applications to the precipitation and separation of common ion effect and their applications to the precipitation and separation of common ion effect and their applications to the precipitation and separation of common ion effect and their applications to the precipitation and separation of common metallic ions as hydroxides, sulphides, carbonates, sulphates and halides. 01 CEMHCC-P-3 Inorganic Chemistry Practical-IB Estimation of Cu ²⁺ 02 02				iii. Estimation of Ca^{2+} using	
Mrs. Saleha II CEMHCC-T-3 Inorganic Chemistry- IB Theory Redox reactions and Precipitation reactions Qualitative idea about complimentary, disproportionation and comproportionation reactions, standard redox potentials with sign conventions, Electrochemical series and its application to explore the feasibility of reactions, and equilibrium constants 06 Nernst equation; effect of pH, complexation and precipitation on redox potentials, formal potential; Basis of redox potential diagrams (Latimer and Frost) of common elements and their applications. 05 Solubility product principle, common on effect and their applications. 04 CEMHCC-P-3 Inorganic Chemistry Practical-IB Estimation of Fe(II) using K ₂ Cr ₂ O ₇ solution 01				$KMnO^4$ solution iv. Estimation	
Mrs. Saleha Khatun II CEMHCC-T-3 Inorganic Chemistry- IB Theory Redox reactions Precipitation reactions Qualitative idea about complimentary, noncomplimentary, disproportionation and comproportionation and comproportionation to explore the feasibility of reactions and equilibrium constants 06 Nerms equation; effect of pH, complexation and precipitation redox potentials, formal potential; Basis of redox titration and redox indicators, Redox potential diagrams (Latimer and Frost) of common delements and their applications. 05 Solubility product principle, common metallic ions as hydroxides, sulphides, carbonates, sulphates and halides. 04 CEMHCC-P-3 Inorganic Chemistry Practical-IB Etermation of Fe(II) using K ₂ Cr ₂ O ₇ solution 01 K ₂ Cr ₂ O ₇ Solution Estimation of Cu ²⁺ 02				of Cu^{2+} iodometrically v	
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			11) Estimation of $Ca(II)$ and $M_{2}(II)$ is a substant	
			Mg(II) in a mixture	02
			i)Mohr'a Salt	02
			i)Tetraamminecarbonatocobalt	
			(III) trihydrate	
Mr. Yasin Nuree	IV	CEMHCC-T-10	Nitrogen Compounds	03
		Organic Chemistry-4	Amines: Aliphatic &	
		Theory	Aromatic:	
			Nitro compounds (aliphatic	02
			and aromatic):	
			Alkylnitrile and isonitrile	02
			Diazonium salts and their	02
			related compounds	
			The Logic of Organic	08
			Synthesis	
			Retrosynthetic analysis:	
			Strategy of ring synthesis:	04
			Asymmetric synthesis:	06
		CEMHCC-P-10	Organic Quantative Estimation	14
		Organic Chemistry-4 Practical		

Mr Md Muttakin	IV	CEMHCC-T-10	Rearrangements. Mechanism	03
Sonkon	1 V	Organia Chamiatry 4	with avidence and	03
Sarkar		Organic Chemistry-4	stars a horizon Eastures for	
			stereocnemical Features for	
			the following	
			Rearrangement to electron-	
			deficient carbon	
			Rearrangement to electron-	01
			deficient nitrogen	
		CEMHCC-P-10	Rearrangement to electron-	02
		Organic Chemistry-4	deficient oxygen	
		Practical	Aromatic rearrangements	01
			C	
			Migration from nitrogen to	01
			ring carbon	
			Rearrangement reactions by	01
			green approach	01
			green upprouen	
			Organic Spectroscopy	02
			UV Spectroscopy	
			IR Spectroscopy	02
			NMR Spectroscopy	05
			r i i i i i i i i i i i i i i i i i i i	
Mr Yasin Nuree	IV	SEC-1B	Drugs & Pharmaceuticals	08
			Introduction	
		CHEMHS – 2A	Fermentation	06
		Pharmaceutical		
			Hands On Practical	06
		Chemistry		
	1			

Dr. Nabin	V	CHEMHT-11	Magnetochemistry	12
Chandra Maity			Classification of magnetic	
			substances, Origin of para	
			magnetic moments,	
			temperature dependence of	
			para magnetism – Curie and	
			Curie-Weiss law, TIP,	
			magnetic susceptibility and its	
			measurement (Gouy method),	
			diamagnetic correction,	
			effective magnetic moment,	
			spin only moment for 3d	
			metals, Orbital contribution to	
			magnetic moment, spin-orbit	
			coupling, quenching of orbital	

	contribution, Sub-normal	
	magnetic moments and	
	antiferromagnetic interactions	
	(elementary idea with	
	examples)	
	Chemistry of d- and f-block	12
	elements	14
	d-block elements	
	Characteristic properties	
	Comparison among the	
	comparison among the	
	reference to electronic	
	configuration ovidation states	
	configuration, oxidation states	
	and E [*] values; General	
	comparison between 3d, 4d	
	and 5d series elements in term	
	of electronic configuration,	
	oxidation states, atomization	
	energy, magnetic properties	
	and coordination chemistry. f-	
	block elements: Comparison	
	between d and f-block	
	elements; Electronic	
	configuration, oxidation states,	
	variation of magnetic	
	properties (Ln^{3+}) , atomic and	
	ionic (3+) radii of lanthanoids;	
	consequences of lanthanide	
	contraction, separation of	
	lanthanides by ion exchange	
	and solvent extraction	
	methods; comparison between	
	lanthanoids and actinoids.	
CHEMHP-11	Quantitative estimation	10
	A. Quantitative: i. Estimation	
	of available chlorine in	
	bleaching powder using	
	iodometry ii. Estimation of	
	available oxygen in pyrolusite	
	using permanganometry iii.	
	Estimation of Cu in brass using	
	iodometry iv. Estimation of Fe	
	in cement using	
	permanganometry v.	
	Estimation of chloride	
	gravimetrically vi. Estimation	
	of Ni(II) using DMG	
	gravimetrically B.	

Mrs. Saleha	V	CEMHCC-T-11	Experiment: i. Paper chromatographic separation of Ni(II) and Co(II) ii. Measurement of 10Dq by spectrophotometric method iii. Preparation of Mn(acac)3 and determination of its λmax colorimetrically structure and bonding of	04
Khatun		Inorganic chemistry- III Theory	coordination compounds on the basis of V. B. Theory and its limitations.	-
		Coordination Chemistry-II	Elementary idea about CFT, splitting of d ⁿ configuration in ML4 to ML6 and ML8 systems, factors affecting, measurement of o, spectrochemical series of ligands,	06
			CFSE in weak and strong fields, OSSE, High spin and low spin complexes, spin isomerism,	02
			tetragonal distortion, Jahn Teller theorem and applications, achievements and limitations of CFT, nephalauxetic effect, stabilisation of unusually high and low oxidation states of 3d series elements	06
			MOT (elementary idea), σ and π bonding in octahedral complexes (a pictorial approach). Colour and electronic spectra of complexes: selection rules for electronic transitions, d-d transition, charge transfer transition (qualitative idea)	04
			L-S coupling and R-S ground state term for atomic no. up to 30, qualitative ORGEL diagram for 3d1 – 3d9 ions with	06

			appropriate symbols for the	
			energy levels.	
		CEMHCC-P-11	Estimation of available	01
		Inorganic Chemistry-	chlorine in bleaching powder	
		IV Practical	using iodometry	
			Estimation of available oxygen	02
			in pyrolusite using	-
			permanganometry	
			Estimation of Fe in cement	02
			using permanganometry	02
			Estimation of Ni(II) using	01
			DMG gravimetrically	
			Estimation of chloride	01
			gravimetrically	
Dr. Sandip Kumar	V	CHEMHT-12	Molecular Spectroscopy	04
Rajak		Physical Chemistry –	Interaction of electromagnetic	
-		IV	radiation	
			Molecular Spectroscopy	06
			Rotation spectroscopy:	
			Vibrational spectroscopy:	06
			Molecular Spectroscopy	04
			Raman spectroscopy:	
			Molecular Spectroscopy	04
			Nuclear Magnetic Resonance	
			(NMR) spectroscopy,	
			Electron Spin Resonance	
			(ESR) spectroscopy:	
			Surface phenomenon	06
			Surface tension and energy:	
			Surface phenomenon	06
			Adsorption:	
			Surface phenomenon	06
			Colloids:	
		CHEMHP-12	Verification of Beer and	02
		Physical Chemistry –	Lambert's Law for KMnO4and	
		IV	K ₂ Cr ₂ O ₇ solution	
			Study of kinetics of K ₂ S ₂ O ₈ +	02
			KI reaction,	
			spectrophotometrically.	
			Determination of CMC from	02
			surface tension	02
			measurements.	
Mr. Delwar	V	CHEMHT-12	Phtochemistry:	06
Ansary		Physical Chemistry –	Lambert-Beer's law	

		IV	Photochemistry:	06
			Photochemical Processes	
			Photochemistry:	06
			Rate of Photochemical	
			processes	
		CHEMHP-12	Determination of surface	02
		Physical Chemistry –	tension of a liquid using	
		IV	Stalagmometer.	
			Determination of pH of	02
			unknown buffer,	
			spectrophotometrically.	
Dr. Nabin	V	CHEMHTDSE-1B	Silicate Industries	9
Chandra Maity		Inorganic Materials of	Fertilizers	9
		Industrial Importance	Surface Coatings	9
			Batteries	9
			Alloys	9
			Catalysis	9
			Chemical explosives	6
Mr. Yasin Nuree	V	CEMH-DSE-T-2C	Twelve principles of Green	06
		Green Chemistry	Chemistry	
		Theory	Prevention/ minimization of	05
		•	hazardous/ toxic products	
			Energy requirements for	05
			reactions – alternative sources	
			of energy	
			Prevention of chemical	06
			accidents designing greener	
			processes	
			Future Trends in Green	04
			Chemistry	
			Oxidation reagents and	
			catalysts	
		CEMH-DSE-P-2C	Green Chemistry Practical	15
		Green Chemistry		
		Practical		
Mr. Md. Muttakin	V	CEMHDSE-T-2C	Green Chemistry	05
Sarkar		Green Chemistry	Introduction to Green	
			Chemistry	
			Examples of Green Synthesis/	10
			Reactions and some real-	
			World cases	
		CEMHDSE-T-2C	Green Chemistry Practical	05
		Green Chemistry		

	Theory	

Dr. Nabin	VI	CHEMHT-13	Bio-inorganic Chemistry	25
Chandra Maity			Essential elements of life, Role	
č			of metal ions in living systems-	
			a brief review. Elementary idea	
			about proteins enzymes and	
			ionophores: Structure of ATP	
			Na ⁺ ion pump and transport of	
			Na ion pump and transport of Na^+ and K^+ across call	
			Na and K across cen	
			membrane; active site	
			structures and bio-functions of	
			haemoglobin, myoglobin,	
			carboxy peptidase A, carbonic	
			anhydrase B, cytochrome c,	
			ferredoxins and chlorophyll;	
			biological nitrogen fixation;	
			toxic metals (Pb, Cd and Hg)	
			and their effects, Wilson	
			disease, chelation therapy;	
			platinum and gold complexes	
			as drugs (examples only).	
			Organometallic chemistry and	25
			catalysis	-
			Definition Classification of	
			organometallic compounds	
			hapticity of ligands	
			nomenclature 16_{-} electron &	
			18 electron rule and its	
			applications: proparation and	
			applications, preparation and hi	
			structure of mono- and bi-	
			nuclear carbonyls of 3d series,	
			synergic effect of CO and use	
			of IR data to explain extent of	
			back bonding; General	
			methods of preparation of	
			metal-carbon σ -bonded	
			complexes, Zeise's salt, Metal-	
			carbon multiple bonding;	
			Preparation, structures,	
			properties and reactions of	
			ferrocene; elementary idea	
			about oxidative addition,	
			reductive elimination, insertion	
			reactions; Study of the	

			following catalytic processes:	
			alkene hydrogenation	
			(Wilkinson's catalyst),	
			hydroformylation. Wacker	
			process. Synthetic gasoline	
			(Fischer Tropsch reaction) and	
			Olefin polymerization reaction	
			(Ziaglar Natta catalyst)	
		CHEMID 12	(Ziegiei-Natta catalyst)	10
	x 7 x	CHEMHP-13	Qualitative semimicro analysis	10
Mrs. Saleha	VI	CEMHCC-T-13	Symmetry as a universal	02
Khatun			theme, concept of symmetry	
		Molecular Symmetry	elements and operations	
		and Point group	(with examples);	
			symmetry properties of atomic	02
			orbitals (s, p and d);	
			identification of molecular	04
			point groups in some simple	-
			molecules	
			and ions.	
			applications of symmetry for	02
			polority and objective	02
			polarity and chirality.	
		Bio-inorganic	Essential elements of life, Role	06
		Chemistry	of metal ions in living systems-	
			a brief review.	
			Elementary idea about proteins	
			enzymes and ionophores:	
			Structure of ATP Na+	
			ion nump and transport of Nat	
			and K_{\perp} approace call membrane:	
			and K+ across cen memorane,	02
			active site	03
			structures and bio-functions of	
			haemoglobin, myoglobin,	
			carboxy peptidase A,	06
			carbonic anhydrase B,	
			cytochrome c, ferredoxins and	
			chlorophyll; biological	
			nitrogen fixation;	
			toxic metals (Pb. Cd and Hg)	04
			and their effects Wilson	-
			disease	
			chelation therapy: platinum and	04
			gold complexes as drugs	04
			(avamples only)	
			(examples only)	
		CEMHCC-P-13	Qualitative semimicro analysis	06
		Qualitative semimicro	of mixtures containing four	
		analysis	radicals (excluding oxide and	

			carbonate). Emphasis should be	
			given to the understanding of	
			the chemistry of different	
			reactions and to assign the	
			most probable composition.	
			Basic Radicals: K^+ , NH4 ⁺ ,	
			$Mg^{2+,}$ Ca^{2+} , Ba^{2+} , Sr^{2+} , Al^{3+} ,	
			Cr^{3+} , Mn^{2+} , Fe^{3+} / Fe^{2+} , Co^{2+} ,	
			Ni ^{2+,}	
			Cu^{2+} , Zn^{2+} , Pb^{2+} , Cd^{2+} , Bi^{3+} ,	
			Sn^{2+} / Sn^{4+} , As^{3+}/As^{5+} , $Sb^{3+/}$	
			Sb ⁵⁺	
			Acid Radicals: Cl ⁻ , Br ⁻ , I ⁻ , S ^{2-,}	02
			SO_4^{2-} , $S_2O_3^{2-}$, SCN^- , NO_3^{-} ,	
			NO_2^- , BO_3^{3-} , PO_4^{3-} , AsO_4^{3-} and	
			H ₃ BO ₃	
			Insoluble Materials: Cr ₂ O ₃ (ig),	03
			$Fe_2O_3(ig), Al_2O_3, SnO_2,$	
			PbSO ₄ , BaSO ₄ , SrSO ₄	
Mr. Yasin Nuree	VI	CEMHCC-T-14	Carbocycles and Heterocycles	06
		Organic Chemistry-4	Polynuclear hydrocarbons and	
		Theory	their derivatives	
			Heterocyclic compounds	04
			Synthesis (including	04
			retrosynthetic approach and	-
			mechanistic details)	
			Pyridine	06
			Cyclic Stereochemistry	06
				00
			Alicyclic compounds	
		CHEMHCC-P-14	Chromatographic Separations	08
		Organic Chemistry-4	Spectroscopic Analysis of	06
		Practical	Organic Compounds	
Mr. Md Muttakin	VI	CEMHCC-T-14	Pericyclic reactions	03
Sarkar		Organic Chemistry-4	Mechanism, stereochemistry,	
		Theory	regioselectivity in case of	
		-	Electrocyclic reactions	
			Cycloaddition reactions	02
			Sigmatropic reactions	02
		CHEMHCC-P-14	Carbohydrates	05
			Monosaccharides,	
			disaccharides, polysaccharides	
			Biomolecules	05
			Amino acids, peptides	

			Chromatographic Separations	05
Dr. Sandip Kumar	VI	CHEMHTDSE-3	Statistical Thermodynamics	06
Rajak		Advanced Physical	Configuration:	
		Chemistry	Statistical Thermodynamics	06
			Boltzmann distribution:	
			Statistical Thermodynamics	06
			Partition function:	
			Special selected topics	07
			Specific heat of solid:	
			Special selected topics	07
			3rd law:	
			Special selected topics	07
			Polymers	
		CHEMHTDSE-3	Roots of equations: (e.g.	02
		Advanced Physical	volume of van der Waals gas	
		Chemistry	and comparison with ideal gas,	
			pH of a weak acid).	
			Numerical differentiation	02
			(e.g., change in pressure	
			of a van der Waals gas	
			potentiometric titrations).	
			·	
			Numerical integration (e.g.	02
			entropy/ enthalpy change	
			from heat capacity data),	
			probability distributions (gas	
			kinetic theory) and mean	
			values.	
Mr. Delwar	VI	CHEMHTDSE-3	Crystal Structure: Bravais	08
Ansary		Advanced Physical	Lattice and Laws of	
		Chemistry	Crystallography:	
			Crystal Structure:	06
			Crystal planes:	
			Crystal Structure:	06
			Determination of crystal	
			structure	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	Ι	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	T	CHEMG-T-01	A cids and bases	03
	1		Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents.	
			Acids and bases Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.	03
			Acids and basesHard and soft acids and bases(HSABconcept),applicationsofHSABprocess.	02
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic Chemistry 1.Electronic displacements	05
			2.Stereochemistry	05

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		3. Nucleophilic Substitution and Elimination Reactions	04	
	CHEMGP-1	Qualitative Analysis of Single	05	
	Organic	Solid Organic Compound(s)		
	Chemistry -1			

Saleha Khatun	II	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			a) Ionic Bonding	
			b) Covalent Bonding	07
			c) MO Approach	07
			Comparative study of p-block	04
			elements:	
			a) Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	
			iii. N-P-As-Sb-Bi	02
			iv. O-S-Se-Te	
			v. F-Cl-Br-I	
		CHEMG-P-02	Qualitative semi-micro	03
			analysis of mixtures	
			containing three radicals.	
			Emphasis should be given	
			to the understanding of the	
			chemistry of different	
			reactions.	
			Acid Radicals: Cl ⁻ , Br ⁻ , I ⁻ , NO ₂ ⁻	
			, NO_3^- , S^{2-} , SO_4^{2-} , BO_3^{3-} ,	
			H ₃ BO ₃ .	
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ ,	02
			Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} ,	
			$Ni^{2+}, Cu^{2+}, NH_4^+.$	
Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	
			Liquids	05

Distribution of Syllabus					
Department Of Chemistry					
	Dumkal College				
		2022-23	5		
		CHEMG-P-02	Surface tension measurement (use of organic solvents excluded)	02	
			Viscosity measurement (use of organic solvents excluded)	02	
Md Muttakin	II	CHEMG-T-02	Solids	05	
Sarkar			Chemical kinetics	05	
		CHEMG-P-02	Viscosity measurement (use of	02	
		Physical Chemistry – I	organic solvents excluded)		

Delwar Ansary	Ι	CHEMG-T-01	Acids and bases Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and	03
			levelling solvents.	
			Acids and bases Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.	03
			Acids and basesHard and soft acids and bases(HSABconcept),applicationsofHSABprocess.	02
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions iodometrically using Na ₂ S ₂ O ₃ .	02
Saleha Khatun	III	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09

		2022 28	1	
			Redox Reactions	04
		CHEMC D 01	Estimation of Fe(II) ions with	01
		CITEWIO-F-01	K ₂ C 1 ₂ O 7	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Md Muttakin	III	CHEMG-T-01	Fundamentals of Organic	05
Sarkar			Chemistry	
			1.Electronic displacements	
			2.Stereochemistry	05
			3. Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic Chemistry -1	Solid Organic Compound(s)	

Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	
			Liquids	05
			Surface tension measurement (use of organic solvents	02
			excluded)	
		CHEMG-P-02	Viscosity measurement (use of	02
			organic solvents excluded)	
Saleha Khatun	IV	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			d) Ionic Bonding	
			Covalent Bonding	07
			MO Approach	07
			Comparative study of p-block	04
			elements:	
			a) Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation states,	04
			inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	

Distribution of Syllabus Department Of Chemistry Dumkal College 2022-23				
			iii. N-P-As-Sb-Bi iv. O-S-Se-Te v. F-Cl-Br-I	02
		CHEMG-P-02	Qualitativesemi-microanalysis of mixtures containingthreeradicals.Emphasisshould be giventotothe understanding of thechemistryofdifferentreactions.Acid Radicals:Cl ⁻ , Br ⁻ , I ⁻ , NO2 ⁻ , NO3 ⁻ , S2 ⁻ , SO42 ⁻ , BO33 ^{-,} H3BO3.	03
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , Sr ²⁺ , Ba ²⁺ , Cr ³⁺ , Mn ²⁺ , Fe ³⁺ , Ni ²⁺ , Cu ²⁺ , NH4 ⁺ .	02
Md Muttakin	IV	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	Ι	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent	
			and solvent, differentiating and	
			A gidg and bases	02
			Lewis acid-base concept	03
			classification of Lewis acids	
			and bases Lux-Flood concept	
			and solvent system concept	
			Acids and bases	02
			Hard and softacids and bases	02
			(HSAB concept), applications	
			of HSAB process.	
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to5 Carbons)	03
			Alkenes:(upto5 Carbons).	04
			Alkynes:(upto5 Carbons)	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu(II)ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic	05
			Chemistry	
			Electronic displacements	
			Stereochemistry	05
			Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic	Solid Organic Compound(s)	05
		Chemistry -1		

Molecular structure:a)Ionic Bondingb)Covalent Bonding07	
a)Ionic Bondingb)Covalent Bonding07	
b) Covalent Bonding 07	
c) MO Approach 07	
Comparative study of p-block 04	
elements:	
a) Group trends in electronic	
configuration, modification of	
pure elements,	
b) Common oxidation states, 04	
inert pair effect, and their	
important compounds in	
respect of the following groups	
of elements	
i. B-Al-Ga-In-Tl	
ii. C-Si-Ge-Sn-Pb	
iii. N-P-As-Sb-Bi 02	
iv. O-S-Se-Te	
v. F-Cl-Br-I	
CHEMG-P-02 Qualitative semi-micro 03	
analysis of mixtures	
containing three radicals.	
Emphasis should be given	
to the understanding of the	
chemistry of different	
reactions. Acid Radicals: Cl ⁻ ,	
Br', Γ , NO_2^- , NO_3^- , S^{2^+} , $SO_4^{2^-}$,	
$\frac{BO_{3}^{-5}}{P} + \frac{H_{3}BO_{3}}{H_{3}} + \frac{H_{3}^{+}}{H_{3}^{+}} $	
Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , 02	
$Sr^{2+}, Ba^{2+}, Cr^{3+}, Mn^{2+}, Fe^{3+},$	
Delwar Ansary II CHEMG-1-02 Kinetic Theory of Gases and 12	
Real gases	
Liquids 05	
CHEMG-P-02 Surface tension measurement 02 (use of organic solvents	
excluded)	
Viscosity measurement (use of 02	
organic solvents excluded)	
MdMuttakin II CHEMG-T-02 Solids 05	
Sarkar Chemical kinetics 05	
CHEMG-P-02 Viscosity measurement (use of 02	
Physical Chemistry – L organic solvents excluded)	

Nabin Chandra			Ionic Equilibria	09
Maity	TTT	CHEMG-T-03	Aryl Halides	04
	111	CHEMG-P-03	Determination of enthalpy of hydration of copper sulphate	02
	III	CHEMG-T-03	Chemical Energetics	12
Delwar Ansary			Carbonyl Compounds	07
		CHEMG-P-03	Determination of heat capacity of calorimeter for different volumes	02
			Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	02
Saleha Khatun	III	CHEMG-T-03	Chemical Equilibrium	09
			Alcohols, Phenols and Ethers	08
		CHEMG-P-03	Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH meter and compare it with the indicator method	02
			Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) a. Sodium acetate-acetic acid b. Ammonium chloride- ammonium hydroxide	02
Md Muttakin	III	CHEMG-T-03	Aromatic hydrocarbons	06
Sarkar			Organometallic compounds	04
		CHEMGP-3 Organic Chemistry -1	Identification of a pure organic compound	04

Nabin Chandra		CHEMG-T-04		10
Maity	IV		Coordination Chemistry	
			Crystal Field Theory	10
		CHEMG-P-04	Complexometric estimation	02
			of (i) Mg2+ or (ii) Zn2+	
			using EDTA.	
			Preparation of any two of	01
			the following complexes:	
			a.tetraammine	

			carbonatocobalt (III) nitrate	
Delwar Ansary	IV	CHEMG-T-04	Phase Equilibrium	07
		CHEMG-P-04	Study of the equilibrium of one of the following reactions by the distribution method: $I_2(aq) + I^-(aq) = I^-$ (aq)	02
			Perform the following potentiometric titrations: Weak acid vs. strong base	02
			Potassium dichromate. Mohr's salt	02
Saleha Khatun	IV	CHEMG-T-04	Conductance	08
			Transition Elements (3d Series)	10
		CHEMG-P-04	Preparation of any two of the following complexes: b. tetraamminecopper(II) sulphate	01
			c. potassium trioxalatochromate(III) trihydrate	01
			d. potassium bisoxalatocuprate(II) trihydrate	01
Md Muttakin	IV	CHEMG-T-04	Solutions	05
Sarkar			Electromotive force	05
		CHEMG-P-4	conductometric titrations:	02
			Strong acid vs. strong base	
Nabin Chandra	V	CHEMGTDSE-1	Chemical Analysis	14
Maity		CHEMGPDSE-1	To find the total hardness of water by EDTA titration	02
			Determination of the strength of the H2O2 sample	02
Delwar Ansary	V	CHEMGTDSE-1	Error Analysis and Computer Applications	12
		CHEMGPDSE-1	To determine the rate constant for the acid catalysed hydrolysis of an ester.	02
			TitrationofHClandCH ₃ CO	02
---------------	-----	---------------	-------------------------------------	----
			OHmixturevsNaOHusingt	
			wodifferentindicatorstofin	
			dtheconcentration.	
Saleha Khatun	V	CHEMGTDSE-1	Industrial Chemistry	18
		CHEMGPDSE-1	Titration of Na2CO3 and	02
			NaHCO3 mixture vs HCl	
			using phenolphthalein and	
			methyl orange	
			indicators	
Md Muttakin	V	CHEMGTDSE-1	Environmental Chemistry	16
Sarkar		CHEMGPDSE-1	Estimation of available	02
~			oxygen in pyrolusite	°-
Nabin Chandra	VI	CHEMGTDSE-2	Polymers	04
Maity	• 1	CHEMICIDDE 2	Paints	03
Wally			Varnishes	03
			Fats and Oils	02
		CHEMCDDSE 2	Durification of the and	03
		CHEMOPDSE-2	product is to be made by	02
			arrustallisation from	
			uster/slashal	
			Water/alconor	02
			Estimation of	02
			saponification value of oil	
Dalaan Awaaa	171	CHEMCTDRE 2	/ ester / fat.	10
Delwar Ansary	V I	CHEMGIDSE-2	Amines and Diazonium Salts	10
			Amino Acids and	10
			Carbohydrates	10
		CHEMGPDSE-2	Hydrolysis of	02
		CHEMOLDGE 2	amides/imides	02
			A cetylation of aromatic	02
			amines	02
Saleha Khatun	VI	CHEMGTDSE-2	Synthetic dyes	02
Sulena Matan	• 1	CHEMICIDDE 2	Drugs and	03
			Phermaceuticals	05
			Pesticides	03
			Fermentation Chemicals	03
		CHEMCPDSE 2	Estimation of acetic acid in	01
		CHEWIOI DSE-2	commercial vinegar	01
			Estimation of amino acid	02
			by formal titration	02
Md Muttakin	VI	CHEMGTDSE 2	Carboxylic Acids and	06
Sarkar	V I	CHEWICIDSE-2	Their	00
Jaikai			Derivatives	
			Industrial Chamister	02
			Food additives	02
		CHEMCPDSE 2	Nitration of aromatic	02
		CHEMOPDSE-2	aompounda	02
			compounds	

	Purification of the crude	01
	product is to be made by	
	crystallization from	
	water/alcohol.	

Name of Teacher	Semester	Paper	Content	No. of
		-		Lecture
Dr. Nabin Chandra	Ι	CEMHCC-TH-1	Periodic properties	7
Maity			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept. Heisenberg's	
			uncertainty principle and its	
			significance	
			Time independent	7
			Schrödinger's wave equation	/
			(without application and	
			(without application and	
			w and w? Radial and angular	
			ψ and $\psi 2$, Radial and angular	
			wave functions for hydrogen	
			atom (qualitative idea), radial	
			probability distribution curves,	
			shapes of s, p, d and f orbitals	
			(qualitative idea), Quantum	
			numbers and their significance,	
			Pauli's exclusion principle,	
			Aufbau principle and	
			limitations, Hund's rules,	
			exchange energy, electronic	
			configurations of atoms.	
			Elementary idea of microstates.	
			Acidimetry and alkalimetry	10
Mrs. Saleha	Ι	CEMHCC-TH-1	Inorganic chemistry-I Theory	06
Khatun			Extranuclear structure of atom	
			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept, Heisenberg's	
			uncertainty principle and its	
			significance, Time independent	
			Schrödinger's wave equation	
			(without application and	
			solution detail)	
			Significance of w and w?	04
			Radial and ψ^2 ,	. ·
			angular wave functions for	
			hydrogen atom (qualitative	
			idea), radial probability	

			of molecules	
			Concept of chirality and	07
			symmetry:	
		CEMHCC-P-2	Separation	04
		Organic Chemistry-1	Determination of boiling point	04
		Practical	Identification of a Pure Organic	08
			Compound by chemical test	
Mr. Md Muttakin	Ι	CEMHCC-T-2	Bonding and Physical	02
Sarkar		Organic	Properties	
		Chemistry-1	Valence Bond Theory	
		Theory	Electronic displacements	04
			MO theory	04
			Physical properties	03
			Stereochemistry-I	03
			Relative and absolute	
			configuration	
			Optical activity of chiral	04
			compounds	

Dr. Nabin Chandra	II	CHEMHT-3	Acid-Base Concepts and	8
Maity			Solvents	0
Walty			Descritulation of Ambonius	
			Recapitulation of Affinemus	
			concept, Bronsted-Lowry	
			concept, Solvent system	
			concept (in H ₂ O, liq. NH ₃ , liq.	
			SO ₂ and liq. HF), Lux-Flood	
			concept, Lewis concept	
			Drago-Wayland equation,	7
			Solvent levelling and	
			differentiating effects, Relative	
			strength of different acids and	
			bases, Pauling's rules,	
			Hammett acidity function and	
			super acids, HSAB principle	
			and its applications. Acid-base	
			equilibria in aqueous solution	
			pu Duffer Agid bage	
			pri, Bullet, Actu-base	
			neutralization curves and	
			choice of indicators. Gas phase	
			acidity.	
			Quantitative Chemical	10
			Analysis	

			I. Estimation of Fe(II) using $K_2Cr_2O_7$ solution II.	
			Estimation of Fe(III) using	
			$K_2Cr_2O_7$ and $KIVInO_4$ solution	
			111. Estimation of Ca^{-1} using	
			KMINO [*] solution iv. Estimation	
			of Cu^{-1} iodometrically V.	
			Estimation of Cr ⁺ using	
	TT		K ₂ Cr ₂ O ₇ solution	0.6
Mrs. Saleha	11	CEMHCC-T-3	Redox reactions and	06
Khatun		Inorganic Chemistry-	Precipitation reactions	
		IB Theory	Qualitative idea about	
			complimentary,	
			noncomplimentary,	
			disproportionation and	
			comproportionation reactions,	
			standard redox potentials with	
			sign	
			conventions, Electrochemical	
			series and its application to	
			explore the feasibility	
			of reactions and equilibrium	
			constants	0.7
			Nernst equation; effect of pH,	05
			complexation and precipitation	
			on redox potentials, formal	
			potential; Basis of	
			redox titration and redox	
			indicators, Redox potential	
			diagrams (Latimer and	
			Frost) of common elements	
			and their applications.	
			Solubility product principle,	04
			common ion effect and their	
			applications to the	
			precipitation and separation of	
			common metallic ions as	
			hydroxides, sulphides,	
			carbonates, sulphates and	
			halides.	
		CEMHCC-P-3	Estimation of Fe(II) using	01
		Inorganic Chemistry	K ₂ Cr ₂ O ₇ solution	
		Practical-IB	Estimation of Fe(III) using	01
			K ₂ Cr ₂ O ₇ Solution	
			Estimation of Cu ²⁺	02
			iodometrycally	-

				01
			Estimation of Cr ³⁺ using	
			K ₂ Cr ₂ O ₇ Solution	
Dr. Sandip Kumar	II	CHEMHT-3	Chemical kinetics	05
Rajak		Physical chemistry-IB	Rate law, order and	
			molecularity:	
			Chemical kinetics	07
			Role of Temperature and	
			theories of reaction rate:	
			Chemical kinetics	06
			Homogeneous catalysis:	
		CHEMHP-3	Study of kinetics of acid-	04
		Physical chemistry-IB	catalyzed hydrolysis of methyl	01
		I hysical chemistry ib	acetate	
			Study of kinetics of	04
			decomposition of H_2O_2	07
			decomposition of H ₂ O ₂ .	
Mr Delwar	П	СНЕМНТ 3	Chamical Thermodynamics II:	05
Ansary	11	Dhysical chemistry IB	Second Law	05
Alisary		T Hysical chemisu y-1D	Second Law	
			Chamical Thormodynamics II:	05
			Chemical Thermodynamics-II.	05
			clausius inequality, Criteria for	
			spontaneity and equilibrium.	02
			Chemical Thermodynamics-II:	02
			Thermodynamic relations:	0.6
Mr. Yasın Nuree	11	CEMHCC-T-4	Stereochemistry-II	06
		Organic Chemistry-2 Theory	Stereochemistry-II	
		Theory	Concept of pro-	04
			stereoisomerism:	01
			Conformation:	06
			Substitution and Elimination	00
			Bassions	08
			Elimination reactions:	
		CEMUCC D 4	Concernic Presentations.	10
		CEMHCC-P-4	Organic Preparations	18
		Organic Chemistry-2		
M. MING (C. 1.	TT	Practical		02
Mr. Ma Muttakin	Ш	CEMHCC-1-4	General Treatment of Reaction	02
Sarkar		Organic Chemistry-2	Niechanism II	
			Reaction thermodynamics	
			Concept of organic acids and	02
			bases	~ _
			Tautomerism	04
			Reaction kinetics	05

	Substitution	and	Elimination	03
	Reactions			
	Free-radical		substitution	
	reaction			
	Nucleophilic		substitution	04
	reactions			

Dr. Sandip Kumar	III	CHEMHT-5	Transport processes	10
Rajak		Physical Chemistry –	Viscosity:	
		II	Transport processes	10
			Conductance and transport	
			number:	
			Foundation of Quantum	04
			Mechanics Beginning of	
			Quantum Mechanics:	
			Foundation of Quantum	06
			Wave function: Mechanics	
			Foundation of Quantum	05
			Mechanics	
			Concept of Operators:	
			Foundation of Quantum	05
			Mechanics	
			Particle in a box:	
		CHEMHP-5	Determination of partition	04
		Physical Chemistry –	coefficient for the distribution	
		II	of I ₂ between water andCCl ₄	
			Determination of K _{eq} for KI	04
			+ I_2 = KI ₃ , using partition	
			coefficient between water	
			and CCl ₄ .	
			Conductometric titration of an	04
			acid (strong, weak/ monobasic,	
			dibasic) againststrong base.	
Mr. Delwar	III	CHEMHT-5	Application of	03
Ansary		Physical Chemistry –	Thermodynamics-I: Partial	
		II	properties and chemical	
			potential:	
			Application of	03
			Thermodynamics-I: Chemical	
			Equilibrium:	
			Application of	03

			Thermodynamics-I:	
			Application of	04
			Thermodynamics-I: Nernst's	
			distribution law;	
			Chemical potential and other	04
			properties of ideal substances-	
			pure and mixtures: Pure ideal	
			gas:	
			Application of	03
			Thermodynamics-I:	
			Condensed Phase	
		CHEMHP-5	Study of viscosity of	04
		Physical Chemistry –	unknown liquid	
		II	(glycerol, sugar) with	
			respect to water.	
			Application of	03
			Thermodynamics-I: Partial	05
			properties and chemical	
			potential.	
Dr. Nabin Chandra	III	CHEMHT-6	Chemical Bonding–II	14
Maity			Covalent Bond: Lewis	
			structures, formal charge:	
			Oualitative idea of V. B.	
			Theory, directional properties	
			of covalent bond. Concept of	
			Equivalent and non equivalent	
			Hybridization and shapes of	
			simple molecules and ions	
			(examples from main groups),	
			Stereochemically non-rigid	
			molecules – Berry's	
			pseudorotation, Resonance and	
			Dipole moments of inorganic	
			molecules and ions.	

	VSEPR theory and Bent's rule	14
	and their applications; M.O.	
	Theory (elementary pictorial	
	approach), concept of bond	
	order, MO diagram of homo-	
	nuclear diatomics (1 st and 2 nd	
	period elements), hetero-	
	nuclear diatomics (HF, CO,	
	NO, NO ⁺ and CN^{-}) and	
	triatomics (H_2O and BeH_2).	
	Electron sea model and	
	elementary idea about band	
	theory classification of	
	inorganic solids and their	
	conduction properties	
	according to hand theory	
	Ludrogen honding	
	alogifications its affect on the	
	classifications, its effect on the	
	properties of compounds and	
	its importance in biological	
	systems, Vander Waal's	
	forces.	
	Metal extraction and	10
	purification: Basic Metallurgy	
	Idea about ores and minerals,	
	operations involved in	
	metallurgy, Flow chart	
	diagram for the extraction of	
	pure Ti, Ni and U (including	
	reactions) from their important	
	ores and their uses.	
CHEMHP-6	Ouantitative inorganic analysis	10
	i. Estimation of Fe(II) and	-
	Fe(III) in a given mixture	
	using $K_2Cr_2O_7$ solution ii	
	Estimation of Fe(III) and	
	$C_{\rm II}({\rm II})$ in a given mixture using	
	$K_2Cr_2O_7$ solution iii	
	Estimation of $Cr(VI)$ and	
	Mn(II) in a given mixture	
	using KaCraOr solution in	
	Estimation of Eq(III) and	
	Cr(VI) in a given mixture	
	using K Cr O solution	
	using $\kappa_2 Cr_2 O_7$ solution V.	
	Esumation of Fe(II) and	
	Ivin(11) in a given mixture	
	using KMnO4 solution v1.	
	Estimation of Fe(III) and	

			Ca(II) in a given mixture using	
			KMnO ₄ solution	
Mrs. Saleha	III	CEMHCC-T-6	Ionic Bond: Lattice energy,	05
Khatun		Inorganic Chemistry-	Born-Lande equation with	
		II Theory	derivation and	
		5	importance of Kapustinskii	
			expression for lattice energy	
			Born-Haber cycle and	05
			its applications. Polarising	
			power and polarisability of	
			ions, Fajan's rules and its	
			applications	
			radius ratio rules – its	05
			applications and limitations.	
			salvation energy	
			and solubility energetics of	
			dissolution process;	
			Packing in crystals, voids in	05
			crystal lattice nacking	05
			efficiency Structure of jonic	
			solids: rock salt zinc blende	
			wurtzite fluorite antifluorite	
			perovskite and laver lattice	
			Qualitative idea about	02
			stoichiometric and non-	02
			stoichiometric crystal defects	
		CEMHCC_P_6	Estimation of Ee(II) and	02
		Inorganic Chemistry-	$E_{e(III)}$ in a given mixture	02
		II Practical	using K_2 Cr ₂ O ₇ solution	
		II I lactical	Estimation of Cu(II) and	02
			$E_{e}(III)$ in a given mixture	02
			using K ₂ Cr ₂ O ₇ solution	
			$\frac{1}{10000000000000000000000000000000000$	02
			Estimation of $CI(VI)$ and $E_0(III)$ in a given mixture	02
			using K ₂ Cr ₂ O ₇ solution	
			Estimation of Ca(II) and	02
			Estimation of $Ca(\Pi)$ and $Fa(\Pi)$ in a given mixture	02
			using K ₂ Cr ₂ O7 solution	
Mr. Yasin Nuree	Ш	CEMHCC-T-7	Carbonyl and Related	09
	111	Organic Chemistry-3	Compounds	07
		Theory	Addition to C=O	
			Exploitation of acidity of a-H	08
			of C=O	00
			Elementary ideas of Green	03
			Chemistry	
			Nucleophilic addition to $\alpha \beta$ -	03
			unsaturated carbonyl system:	00

			Nucleophilic addition to α . β -	
			unsaturated carbonyl system:	
			Substitution at sp2 carbon	03
			(C=O system)	
		CEMHCC-P-7	Qualitative Organic Analysis	16
		Organic Chemistry-3	of single solid organic	
		Practical	compound	
Mr. Md Muttakin	III	CEMHCC-T-7	Chemistry of alkenes and	06
Sarkar		Organic Chemistry-3	alkynes	
		Theory	Addition to C=C	
			Addition to $C=C$ (in	04
			comparison to C=C)	
		CEMHCC-P-7	Aromatic Substitution	04
		Organic Chemistry-3	Electrophilic aromatic	
		Practical	substitution	
			Organo-metallics	04
			Free-radical substitution	
			Reaction	
Mr. Yasin Nuree	III	SEC-1B	Introduction	04
		Basic Analytical		
		Chemistry	Complexometry	02
			Soil Analysis	02
			Analysis of water	03
			Analysis of food products	03
			Chromatography	03
			Ion-exchange	02
			Analysis of cosmetics	03
			Suggested Applications (Any one)	02
			Suggested Instrumental demonstrations	03

Dr. Sandip Kumar	IV	CHEMH	Г-8	Application	of	08
Rajak		Physical	Chemistry-	Thermodynamics -	- II:	
		III		Colligative properties:		
				Application	of	06
				Thermodynamics – II	: Phase	
				rule:		
				Application	of	06
				Thermodynamics – II:	Binary	
				solutions:		

			Quantum Chemistry	06
			Angular momentum:	
			Quantum Chemistry	08
			Qualitative treatment of	
			hydrogen atom and hydrogen-	
			like ions	
			Quantum Chemistry	06
			LCAO and HF-SCF:	
		CHEMHP-8	Determination of solubility of	02
		Physical Chemistry –	sparingly soluble salt in water,	
		II	in electrolyte. with common	
			(using common indicator)	
			(using common marcutor).	
			pH-metric titration of acid	02
			(mono-and di-basic) against	
			strong base.	
			Determination of K _{sp} for AgCl	02
			by potentiometric titration of	
			AgNO ₃ solution against	
			standard KCl solution.	
Mr. Delwar	IV	CHEMHT-8	Electrical Properties of	08
Ansary		Physical Chemistry-	molecules:	
		III	Ionic equilibria	
		CHEMHP-8	Electrical Properties of	06
		Physical Chemistry –	molecules:	
		II	Electromotive Force:	
			Electrical Properties of	06
			molecules:	
			Dipole moment and	
			polarizability	
			Potentiometric titration of	02
			Mohr's salt solution against	
			standard K ₂ Cr ₂ O-solution.	
			Effect of ionic strength	02
		CHEMHT-8	on the rate of	
		Physical Chemistry-	Persulphate –lodide	
		III	reaction.	
			Study of phanol water	02
			phase diagram	02
			phuse diagram.	
			Electrical Properties of	08
			molecules:	
			Ionic equilibria	
Dr. Nabin	IV	CHEMHT-9	Radioactivity and Nuclear	8
Chandra Maity		/	Chemistry	

stability. n'p ratio and different modes of decay, mass defect, packing fraction and nuclear binding energy. Nuclear forces: Messon exchange theory, elementary idea of nuclear shell model and magic numbers. Fission, fusion and spallation reactions, arificial radioactivity, super heavy elements and their IUPAC nomenclature. Moderators, slow and fast neutrons, Applications of radio-isotopes in: determination of structures, establishment of reaction mechanisms and radio-carbon dating, hazards of radiation and safety measures. Chemistry of s and p-block elements Diagonal relationship (Li-Mg; B-Si) and anomalous behavior of first member of each group, Allotropy and catenation (examples of C. P and S compounds). Study of the following compounds with emphasis on preparation, properties, structure and bonding: Berylium hydrides and halides; diborane; borazine; boron nitride, boric acid, borax, fluorocarbons (with environmental effect); oxides and oxyacids of nitrogen, phosphorous, sulphur and chlorine; Peroxo acids of sulphur; tetrasulphur trtranitride; interhalogens, pseudohalogens, polyhalides, fluorides and oxides of xenon. Noble gas clattrate; basic properties of iodine. Synthesis, structural aspects and		Atomic nucleus – nuclear	
modes of decay, mass defect, packing fraction and nuclear binding energy. Nuclear forces: Meson exchange theory, elementary idea of nuclear shell model and magic numbers. Fission, fusion and spallation reactions, artificial radioactivity, super heavy elements and their IUPAC nomenclature. Moderators, slow and fast neutrons, Applications of radio-isotopes in: determination of structures, establishment of reaction mechanisms and radio-carbon dating, hazards of radiation and safety measures. Chemistry of s and p-block elements 7 Diagonal relationship (Li-Mg; B-Si) and anomalous behavior of first member of eact group, Allotropy and catenation (examples of C, P and S compounds). Study of the following compounds with emphasis on preparation, properties, structure and boric acid, borax, fluoroarbons (with environmental effect); oxides and halides; diborane; borazine; borora acid, borax, fluoroarbons (with environmental effect); oxides and oxyacids of nitrogen, phosphorous, sulphur and chlorine; Peroxo acids of sulphur; tranitride; interhalogens, polyhalides, fluorides and oxides of xenon. Noble gas clathrates; basic properties of oidine, synthesis, structural aspects and an and and avales of xenon.		stability, n/p ratio and different	
packing fraction and nuclear binding energy. Nuclear forces: Meson exchange theory, elementary idea of nuclear shell model and magic numbers. Fission, fusion and spallation reactions, artificial radioactivity, super heavy elements and their IUPAC nomenclature. Moderators, slow and fast neutrons, Applications of radio-isotopes in: determination of structures, establishment of reaction mechanisms and radio-carbon dating, hazards of radiation and safety measures. Chemistry of s and p-block elements 7 Diagonal relationship (Li-Mg; B-Si) and anomalous behavior of first member of each group, Allotropy and catenation, (examples of C, P and S compounds). Study of the following compounds with emphasis on preparation, properties, structure and bonding: Berylium hydrides and halides; diborane; borazine; boron nitride, boric acid, borax, fluorocarbons (with environmental effect); oxides and oxyacids of nitrogen, phosphorous, sulphur and chlorine; Peroxo acids of sulphur; tetrasulphur trranitride; interhalogens, pseudohalogens, polyhalides, fluorides and oxides of stenon. Noble gas clathrates; basic properties of iodine. Synthesis, structural aspects and profiles of odine.		modes of decay, mass defect,	
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Chandra Maity			Classification of magnetic	
			substances, Origin of para	
			magnetic moments,	
			temperature dependence of	
			para magnetism – Curie and	
			Curie-Weiss law, TIP,	
			magnetic susceptibility and its	
			measurement (Gouy method),	
			diamagnetic correction,	
			effective magnetic moment,	
			spin only moment for 3d	
			metals, Orbital contribution to	
			magnetic moment, spin-orbit	
			coupling, quenching of orbital	

	contribution, Sub-normal	
	magnetic moments and	
	antiferromagnetic interactions	
	(elementary idea with	
	examples).	
	Chemistry of d- and f-block	12
	elements	12
	d-block elements	
	Characteristic properties	
	Comparison among the	
	elements of 3d series with	
	reference to electronic	
	configuration oxidation states	
	and E^0 values. General	
	comparison between 3d 4d	
	and 5d series elements in term	
	of electronic configuration	
	ovidation states atomization	
	energy magnetic properties	
	and coordination chemistry f	
	block elements: Comparison	
	between d and f block	
	alaments: Electronic	
	configuration ovidation states	
	variation of magnetic	
	variation of magnetic $(\mathbf{J}, \mathbf{n}^{3+})$ atomic and	
	ionia (21) radii of lanthanoida	
	101110(5+) radii of randialolus,	
	consequences of faithande	
	contraction, separation of	
	and actuant autroation	
	and solvent extraction	
	methods; comparison between	
CUENIID 11	lanthanoids and actinoids.	10
CHEMHP-11	Quantitative estimation	10
	A. Quantitative: 1. Estimation	
	of available chlorine in	
	indometry ii Estimation of	
	iodometry II. Estimation of	
	available oxygen in pyrolusite	
	Estimation of Cu in bross using	
	indometry in Estimation of Ea	
	in compart using	
	ni centent using	
	Estimation of chlorida	
	gravimetrically vi Estimation	
	of Ni(II) using DMC	
	$\frac{1}{2}$ $\frac{1}$	
	graviniculcally D.	

	V		Experiment: i. Paper chromatographic separation of Ni(II) and Co(II) ii. Measurement of 10Dq by spectrophotometric method iii. Preparation of Mn(acac)3 and determination of its λmax colorimetrically	0.4
Mrs. Salena Khatun	V	Inorganic chemistry- III Theory	structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations.	04
		Coordination Chemistry-II	Elementary idea about CFT, splitting of d ⁿ configuration in ML4 to ML6 and ML8 systems, factors affecting, measurement of o, spectrochemical series of ligands.	06
			CFSE in weak and strong fields, OSSE, High spin and low spin complexes, spin isomerism,	02
			tetragonal distortion, Jahn Teller theorem and applications, achievements and limitations of CFT, nephalauxetic effect, stabilisation of unusually high and low oxidation states of 3d series elements	06
			MOT (elementary idea), σ and π bonding in octahedral complexes (a pictorial approach). Colour and electronic spectra of complexes: selection rules for electronic transitions, d-d transition, charge transfer transition (qualitative idea)	04
			L-S coupling and R-S ground state term for atomic no. up to 30, qualitative ORGEL diagram for 3d1 – 3d9 ions with	06

			appropriate symbols for the	
			energy levels	
		CEMHCC P 11	Estimation of available	01
		Levince-F-11	ablaring in blagshing nouder	01
		Inorganic Chemisuy-	chionine in bleaching powder	
		IV Practical		02
			Estimation of available oxygen	02
			in pyrolusite using	
			permanganometry	
			Estimation of Fe in cement	02
			using permanganometry	
			Estimation of Ni(II) using	01
			DMG gravimetrically	
			Estimation of chloride	01
			gravimetrically	
Dr. Sandip Kumar	V	CHEMHT-12	Molecular Spectroscopy	04
Rajak		Physical Chemistry –	Interaction of electromagnetic	
1.00/0011		IV	radiation	
			Molecular Spectroscopy	06
			Rotation spectroscopy	00
			Vibrational spectroscopy:	06
			viorational spectroscopy.	00
			Molecular Spectroscopy	04
			Roman spectroscopy	04
			Maham Spectroscopy.	0.4
			Molecular Spectroscopy	04
			Nuclear Magnetic Resonance	
			(NMR) spectroscopy,	
			Electron Spin Resonance	
			(ESR) spectroscopy:	
			Surface phenomenon	06
			Surface tension and energy:	
			Surface phenomenon	06
			Adsorption:	
			Surface phenomenon	06
			Colloids:	
		CHEMHP-12	Verification of Beer and	02
		Physical Chemistry –	Lambert's Law for KMnO4and	
		IV	K ₂ Cr ₂ O ₇ solution	
			Study of kinetics of K ₂ S ₂ O ₈ +	02
			KI reaction,	
			spectrophotometrically.	
			Determination of CMC from	02
			surface tension	
			measurements.	
Mr. Delwar	V	CHEMHT-12	Phtochemistry:	06
Ansary		Physical Chemistry –	Lambert-Beer's law	

		IV	Photochemistry:	06
			Photochemical Processes	
			Photochemistry:	06
			Rate of Photochemical	
			processes	
		CHEMHP-12	Determination of surface	02
		Physical Chemistry –	tension of a liquid using	
		IV	Stalagmometer.	
			Determination of pH of	02
			unknown buffer	02
			spectrophotometrically.	
			speed opnotonie die diry.	
Dr. Nabin	V	CHEMHTDSE-1B	Silicate Industries	9
Chandra Maity		Inorganic Materials of	Fertilizers	9
		Industrial Importance	Surface Coatings	9
			Batteries	9
			Alloys	9
			Catalysis	9
			Chemical explosives	6
Mr. Yasin Nuree	V	CEMH-DSE-T-2C	Twelve principles of Green	06
	·	Green Chemistry	Chemistry	00
		Theory	Prevention/ minimization of	05
			hazardous/ toxic products	
			Energy requirements for	05
			reactions – alternative sources	00
			of energy	
			Prevention of chemical	06
			accidents designing greener	00
			processes	
			Future Trends in Green	04
			Chemistry	
			Oxidation reagents and	
			catalysts	15
		CEMH-DSE-P-2C	Green Chemistry Practical	15
		Green Chemistry		
		Practical		
Mr. Md. Muttakin	V	CEMHDSE-T-2C	Green Chemistry	05
Sarkar		Green Chemistry	Introduction to Green	
			Chemistry	
			Examples of Green Synthesis/	10
			Reactions and some real-	
			World cases	
		CEMHDSE-T-2C	Green Chemistry Practical	05
		Green Chemistry	,	

	Theory	

Dr. Nabin VI CHEMHT-13 Bio-inorganic Chemistry	25
Chandra Maity Essential elements of life, Role	
of metal ions in living systems-	
a brief review. Elementary idea	
about proteins, enzymes and	
ionophores: Structure of ATP	
Na ⁺ ion pump and transport of	
Na^+ and K^+ across call	
INA allu K actoss cell membranet estive site	
memorane; active site	
structures and bio-functions of	
haemoglobin, myoglobin,	
carboxy peptidase A, carbonic	
anhydrase B, cytochrome c,	
ferredoxins and chlorophyll;	
biological nitrogen fixation;	
toxic metals (Pb, Cd and Hg)	
and their effects, Wilson	
disease, chelation therapy;	
platinum and gold complexes	
as drugs (examples only).	
Organometallic chemistry and	25
catalysis	
Definition. Classification of	
organometallic compounds	
hapticity of ligands	
nomenclature 16- electron &	
18-electron rule and its	
applications: propagation and	
applications, preparation and structure of mono and hi	
structure of mono- and of-	
nuclear carbonyls of 3d series,	
synergic effect of CO and use	
of IR data to explain extent of	
back bonding; General	
methods of preparation of	
metal-carbon σ-bonded	
complexes, Zeise's salt, Metal-	
carbon multiple bonding;	
Preparation, structures,	
Preparation, structures, properties and reactions of	
Preparation, structures, properties and reactions of ferrocene; elementary idea	
Preparation, structures, properties and reactions of ferrocene; elementary idea about oxidative addition,	
Preparation, structures, properties and reactions of ferrocene; elementary idea about oxidative addition, reductive elimination, insertion	

		following catalytic processes:	
		alkene hydrogenation	
		(Wilkinson's catalyst).	
		hydroformylation Wacker	
		process Synthetic gasoline	
		(Fischer Tropsch reaction) and	
		Olefin polymorization reaction	
		(Ziggler Nette getelvet)	
		(Ziegier-Natta cataryst)	10
	CHEMHP-13	Qualitative semimicro analysis	10
Mrs. Saleha VI	CEMHCC-T-13	Symmetry as a universal	02
Khatun		theme, concept of symmetry	
	Molecular Symmetry	elements and operations	
	and Point group	(with examples);	
		symmetry properties of atomic	02
		orbitals (s, p and d);	
		identification of molecular	04
		point groups in some simple	
		molecules	
		and ions:	
		applications of symmetry for	02
		polarity and chirality	02
		polarity and enhanty.	
	Bio-inorganic	Essential elements of life, Role	06
	Chemistry	of metal ions in living systems-	
		a brief review,	
		Elementary idea about proteins,	
		enzymes and ionophores;	
		Structure of ATP, Na+	
		ion pump and transport of Na+	
		and K+ across cell membrane;	
		active site	03
		structures and bio-functions of	
		haemoglobin, myoglobin,	
		carboxy peptidase A	06
		carbonic anhydrase B	00
		cytochrome c ferredoxins and	
		chlorophyll: biological	
		nitrogen fixation	
		toxic metals (Dh. Cd and Un)	04
		and their effects Wilson	04
		diagona	
		uiscase,	0.4
		cheration therapy; platinum and	04
		gold complexes as drugs	
		(examples only)	
	CEMHCC-P-13	Qualitative semimicro analysis	06
	Qualitative semimicro	of mixtures containing four	
	analysis	radicals (excluding oxide and	

			carbonate). Emphasis should be	
			given to the understanding of	
			the chemistry of different	
			reactions and to assign the	
			most probable composition.	
			Basic Radicals: K^+ , NH4 ⁺ ,	
			$Mg^{2+,}$ Ca^{2+} , Ba^{2+} , Sr^{2+} , Al^{3+} ,	
			Cr^{3+} , Mn^{2+} , Fe^{3+} / Fe^{2+} , Co^{2+} ,	
			Ni ^{2+,}	
			Cu^{2+} , Zn^{2+} , Pb^{2+} , Cd^{2+} , Bi^{3+} ,	
			Sn^{2+} / Sn^{4+} , As^{3+}/As^{5+} , $Sb^{3+/}$	
			Sb ⁵⁺	
			Acid Radicals: Cl^- , Br^- , I^- , S^{2-} ,	02
			SO_4^{2-} , $S_2O_3^{2-}$, SCN^- , NO_3^- ,	
			NO_2^- , BO_3^{3-} , PO_4^{3-} , AsO_4^{3-} and	
			H ₃ BO ₃	
			Insoluble Materials: Cr ₂ O ₃ (ig),	03
			$Fe_2O_3(ig)$, Al_2O_3 , SnO_2 ,	
			PbSO ₄ , BaSO ₄ , SrSO ₄	0.4
Mr. Yasin Nuree	VI	CEMHCC-T-14	Carbocycles and Heterocycles	06
		Organic Chemistry-4	Polynuclear hydrocarbons and	
		Ineory	their derivatives	0.4
			Heterocyclic compounds	04
			Synthesis (including	04
			retrosynthetic approach and	
			mechanistic details)	
			Pyridine	06
			Cyclic Stereochemistry	06
			Alicyclic compounds	
		CHEMHCC-P-14	Chromatographic Separations	08
		Organic Chemistry-4	Spectroscopic Analysis of	06
		Practical	Organic Compounds	00
Mr. Md Muttakin	VI	CEMHCC-T-14	Pericyclic reactions	03
Sarkar		Organic Chemistry-4	Mechanism, stereochemistry,	
		Theory	regioselectivity in case of	
		•	Electrocyclic reactions	
			Cycloaddition reactions	02
			Sigmatropic reactions	02
			Carbohydrates	05
			Carbonyurates Monosocoharides	05
			disaccharidas polysaccharidas	
			Biomolecules	05
			Amino acide peptides	05
			Amino acido, populaçõ	

			Chromatographic Separations	05
Dr. Sandip Kumar	VI	CHEMHTDSE-3	Statistical Thermodynamics	06
Rajak		Advanced Physical	Configuration:	
		Chemistry	Statistical Thermodynamics	06
			Boltzmann distribution:	
			Statistical Thermodynamics	06
			Partition function:	
			Special selected topics	07
			Specific heat of solid:	
			Special selected topics	07
			3rd law:	
			Special selected topics	07
			Polymers	
		CHEMHTDSE-3	Roots of equations: (e.g.	02
		Advanced Physical	volume of van der Waals gas	
		Chemistry	and comparison with ideal gas,	
			pH of a weak acid).	
			Numerical differentiation	02
			(e.g., change in pressure	
			of a van der Waals gas.	
			potentiometric titrations).	
			Numerical integration (e.g.	02
			entropy/ enthalpy change	
			from heat capacity data),	
			probability distributions (gas	
			kinetic theory) and mean	
			values.	
Mr. Delwar	VI	CHEMHTDSE-3	Crystal Structure: Bravais	08
Ansary		Advanced Physical	Lattice and Laws of	
		Chemistry	Crystallography:	
			Crystal Structure:	06
			Crystal planes:	
			Crystal Structure:	06
			Determination of crystal	
			structure	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	1	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	I	CHEMG-T-01	Acids and bases Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents	03
			Acids and bases Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.	03
			Acids and basesHard and soft acids and bases(HSABconcept),applicationsofHSABprocess.	02
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	I	CHEMG-T-01	Fundamentals of Organic Chemistry 1.Electronic displacements	05
			2.Stereochemistry	05

	3. Nucleophilic Substitution and Elimination Reactions	04
CHEMGP-1	Qualitative Analysis of Single	05
Organic	Solid Organic Compound(s)	
Chemistry -1		

Saleha Khatun	II	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			a) Ionic Bonding	
			b) Covalent Bonding	07
			c) MO Approach	07
			Comparative study of p-block	04
			elements :	
			a)Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	
			iii. N-P-As-Sb-Bi	02
			iv. O-S-Se-Te	
			v. F-Cl-Br-I	
		CHEMG-P-02	Qualitative semi-micro	03
			analysis of mixtures	
			containing three radicals.	
			Emphasis should be given	
			to the understanding of the	
			chemistry of different	
			reactions.	
			Acid Radicals: Cl^- , Br^- , I^- , NO_2^-	
			$, NO_3^{-}, S^{2-}, SO_4^{2-}, BO_3^{3-},$	
			H ₃ BO ₃ .	
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ ,	02
			Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} ,	
			$Ni^{2+}, Cu^{2+}, NH_4^+.$	
Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	~ ~
			Liquids	05

		Distribution of S	Syllabus	
		Department Of C	hemistry	
		Dumkal Col	lege	
		2021-22		
		CHEMG-P-02	Surface tension measurement (use of organic solvents excluded)	02
			Viscosity measurement (use of organic solvents excluded)	02
Md Muttakin	II	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent and	
			solvent, differentiating and	
			levelling solvents.	
			Acids and bases	03
			Lewis acid-base concept,	
			classification of Lewis acids	
			and bases, Lux-Flood concept	
			and solvent system concept.	
			Acids and bases	02
			Hard and soft acids and bases	
			(HSAB concept),	
			applications of HSAB	
			process.	
			Aliphatic Hydrocarbons	02
			Introduction	
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
			Estimation of ovalia said by	02
		CHEMG-P-01	titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions	02
			iodometrically using Na ₂ S ₂ O ₃ .	
Saleha Khatun	III	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09

		2021 22		
			Redox Reactions	04
			Estimation of Fe(II) ions with	01
		CHEMG-P-01	$K_2Cr_2O_7$	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Md Muttakin	III	CHEMG-T-01	Fundamentals of Organic	05
Sarkar			Chemistry	
			1.Electronic displacements	
			2.Stereochemistry	05
			3. Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic Chemistry -1	Solid Organic Compound(s)	

Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	05
			Liquids	05
			(use of organic solvents excluded)	02
		CHEMG-P-02	Viscosity measurement (use of	02
			organic solvents excluded)	•
Saleha Khatun	IV	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			d) Ionic Bonding	
			Covalent Bonding	07
			MO Approach	07
			Comparative study of p-block	04
			elements :	
			a)Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	

Distribution of Syllabus Department Of Chemistry Dumkal College 2021-22				
			iii. N-P-As-Sb-Bi iv. O-S-Se-Te v. F-Cl-Br-I	02
		CHEMG-P-02	Qualitativesemi-microanalysis of mixtures containingthreeradicals.Emphasisshould be givento the understanding of thechemistryofdifferentreactions.Acid Radicals: Cl ⁻ , Br ⁻ , I ⁻ , NO2 ⁻ , NO3 ⁻ , S2 ⁻ , SO42 ⁻ , BO33 ^{-,} H3BO3.	03
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , Sr ²⁺ , Ba ²⁺ , Cr ^{3+,} Mn ²⁺ , Fe ³⁺ , Ni ²⁺ , Cu ²⁺ , NH4 ⁺ .	02
Md Muttakin	IV	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	Ι	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent	
			and solvent, differentiating and	
			A gidg and bases	02
			Lewis acid-base concept	03
			classification of Lewis acids	
			and bases Lux-Flood concept	
			and solvent system concept	
			Acids and bases	02
			Hard and softacids and bases	02
			(HSAB concept), applications	
			of HSAB process.	
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to5 Carbons)	03
			Alkenes:(upto5 Carbons).	04
			Alkynes:(upto5 Carbons)	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu(II)ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic	05
			Chemistry	
			Electronic displacements	
			Stereochemistry	05
			Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic	Solid Organic Compound(s)	05
		Chemistry -1		

Molecular structure:a)Ionic Bondingb)Covalent Bonding07	
a)Ionic Bondingb)Covalent Bonding07	
b) Covalent Bonding 07	
c) MO Approach 07	
Comparative study of p-block 04	
elements:	
a) Group trends in electronic	
configuration, modification of	
pure elements,	
b) Common oxidation states, 04	
inert pair effect, and their	
important compounds in	
respect of the following groups	
of elements	
i. B-Al-Ga-In-Tl	
ii. C-Si-Ge-Sn-Pb	
iii. N-P-As-Sb-Bi 02	
iv. O-S-Se-Te	
v. F-Cl-Br-I	
CHEMG-P-02 Qualitative semi-micro 03	
analysis of mixtures	
containing three radicals.	
Emphasis should be given	
to the understanding of the	
chemistry of different	
reactions. Acid Radicals: Cl ⁻ ,	
Br', Γ , NO_2^- , NO_3^- , S^{2^+} , $SO_4^{2^-}$,	
$\frac{BO_{3}^{-5}}{P} + \frac{H_{3}BO_{3}}{H_{3}} + \frac{H_{3}^{+}}{H_{3}^{+}} $	
Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , 02	
$Sr^{2+}, Ba^{2+}, Cr^{3+}, Mn^{2+}, Fe^{3+},$	
Delwar Ansary II CHEMG-1-02 Kinetic Theory of Gases and 12	
Real gases	
Liquids 05	
CHEMG-P-02 Surface tension measurement 02 (use of organic solvents	
excluded)	
Viscosity measurement (use of 02	
organic solvents excluded)	
MdMuttakin II CHEMG-T-02 Solids 05	
Sarkar Chemical kinetics 05	
CHEMG-P-02 Viscosity measurement (use of 02	
Physical Chemistry – L organic solvents excluded)	

Nabin Chandra			Ionic Equilibria	09
Maity	III	CHEMG-T-03	Aryl Halides	04
		CHEMG-P-03	Determination of enthalpy of hydration of copper sulphate	02
	III	CHEMG-T-03	Chemical Energetics	12
Delwar Ansary			Carbonyl Compounds	07
		CHEMG-P-03	Determination of heat capacity of calorimeter for different volumes	02
			Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	02
Saleha Khatun	III	CHEMG-T-03	Chemical Equilibrium	09
			Alcohols, Phenols and Ethers	08
		CHEMG-P-03	Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH meter and compare it with the indicator method	02
			Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) a. Sodium acetate-acetic acid b. Ammonium chloride- ammonium hydroxide	02
Md Muttakin	III	CHEMG-T-03	Aromatic hydrocarbons	06
Sarkar			Organometallic compounds	04
		CHEMGP-3 Organic Chemistry -1	Identification of a pure organic compound	04

Nabin Chandra		CHEMG-T-04		10
Maity	IV		Coordination Chemistry	
			Crystal Field Theory	10
		CHEMG-P-04	Complexometric estimation	02
			of (i) Mg2+ or (ii) Zn2+	
			using EDTA.	
			Preparation of any two of	01
			the following complexes:	
			a.tetraammine	

			carbonatocobalt (III) nitrate	
Delwar Ansary	IV	CHEMG-T-04	Phase Equilibrium	07
		CHEMG-P-04	Study of the equilibrium of one of the following reactions by the distribution method: $I_2(aq) +I^-(aq) = I^-$ (aq)	02
			Perform the following potentiometric titrations: Weak acid vs. strong base	02
			Potassium dichromate. Mohr's salt	02
Saleha Khatun	IV	CHEMG-T-04	Conductance	08
			Transition Elements (3d Series)	10
		CHEMG-P-04	Preparation of any two of the following complexes: b. tetraamminecopper(II) sulphate	01
			c. potassium trioxalatochromate(III) trihydrate	01
			d. potassium bisoxalatocuprate(II) trihydrate	01
Md Muttakin	IV	CHEMG-T-04	Solutions	05
Sarkar			Electromotive force	05
		CHEMG-P-4	conductometric titrations:	02
			Strong acid vs. strong base	
Nabin Chandra	V	CHEMGTDSE-1	Chemical Analysis	14
Maity		CHEMGPDSE-1	To find the total hardness of water by EDTA titration	02
			Determination of the strength of the H2O2 sample	02
Delwar Ansary	V	CHEMGTDSE-1	Error Analysis and Computer Applications	12
		CHEMGPDSE-1	To determine the rate constant for the acid catalysed hydrolysis of an ester.	02

			TitrationofHClandCH ₃ CO	02
			OHmixturevsNaOHusingt	
			wodifferentindicatorstofin	
			dtheconcentration.	
Saleha Khatun	V	CHEMGTDSE-1	Industrial Chemistry	18
		CHEMGPDSE-1	Titration of Na2CO3 and	02
			NaHCO3 mixture vs HCl	-
			using phenolphthalein and	
			methyl orange	
			indicators	
Md Muttakin	V	CHEMGTDSE-1	Environmental Chemistry	16
Sarkar	·	CHEMGPDSE-1	Estimation of available	02
Burkur			oxygen in pyrolusite	02
Nahin Chandra	VI	CHEMGTDSE_2	Polymers	04
Maity	V I	CHEWIOTDSE-2		04
Waity			F allits Verniches	03
				02
			Fats and Oils	03
		CHEMGPDSE-2	Purification of the crude	02
			product is to be made by	
			crystallisation from	
			water/alcohol	
			Estimation of	02
			saponification value of oil	
			/ ester / fat.	
Delwar Ansary	VI	CHEMGTDSE-2	Amines and Diazonium	10
			Salts	
			Amino Acids and	10
			Carbohydrates	
		CHEMGPDSE-2	Hydrolysis of	02
			amides/imides	
			Acetylation of aromatic	02
			amines	
Saleha Khatun	VI	CHEMGTDSE-2	Synthetic dyes	02
			Drugs and	03
			Phermaceuticals	
			Pesticides	03
			Fermentation Chemicals	03
		CHEMGPDSE-2	Estimation of acetic acid in	01
			commercial vinegar	
			Estimation of amino acid	02
			by formol titration	
Md Muttakin	VI	CHEMGTDSE-2	Carboxylic Acids and	06
Sarkar			Their	
			Derivatives	
			Industrial Chemistry	02
			Food additives	
		CHEMGPDSE-2	Nitration of aromatic	02
		-	compounds	

	Purification of the crude	01
	product is to be made by	
	crystallization from	
	water/alcohol.	

Name of Teacher	Semester	Paper	Content	No. of
		-		Lecture
Dr. Nabin Chandra	Ι	CEMHCC-TH-1	Periodic properties	7
Maity			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept. Heisenberg's	
			uncertainty principle and its	
			significance	
			Time independent	7
			Schrödinger's wave equation	/
			(without application and	
			(without application and	
			w and w? Redial and angular	
			ψ and $\psi 2$, Radial and angular	
			wave functions for hydrogen	
			atom (qualitative idea), radial	
			probability distribution curves,	
			shapes of s, p, d and f orbitals	
			(qualitative idea), Quantum	
			numbers and their significance,	
			Pauli's exclusion principle,	
			Aufbau principle and	
			limitations, Hund's rules,	
			exchange energy, electronic	
			configurations of atoms.	
			Elementary idea of microstates.	
			Acidimetry and alkalimetry	10
Mrs. Saleha	Ι	CEMHCC-TH-1	Inorganic chemistry-I Theory	06
Khatun			Extranuclear structure of atom	
			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept, Heisenberg's	
			uncertainty principle and its	
			significance, Time independent	
			Schrödinger's wave equation	
			(without application and	
			solution detail)	
			Significance of w and w?	04
			Radial and ψ^2 ,	. ·
			angular wave functions for	
			hydrogen atom (qualitative	
			idea), radial probability	
			distribution curves, shapes of s,	
------------------	---	---------------	-----------------------------------	------------
			p, d and f orbitals (qualitative	
			idea)	
			Quantum	04
			numbers and their significance	.
			Pauli's exclusion principle	
			Aufbau principle and	
			limitations Hund's rules	
			auchange energy Electronic	
			exchange energy, Electronic	
			Configurations of atoms.	02
			Elementary idea of microstates	02
		CEMHCC-P-1	Method of Preparation of	02
		Inorganic	standard solutions of titrants	
		Chemistry-IA	Estimation of Carbonate and	02
		practical	hydroxide present together in a	
			mixture	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Dr.Sandip Kumar	Ι	CHEMHT-IA	Kinetic Theory and Gaseous	06
Rajak		Physical	state	
5		Chemistry-IA	Kinetic Theory of gases	
		5	Maxwell's distribution of speed	06
			and energy	00
			Real gas and virial equation	06
		CHEMHP-IA	Determination of heat of	02
		Physical	neutralization of a strong acid	02
		Chemistry-IA	by a strong base.	
		Chennisu y-IA		
			Determination of heat of solute	02
			ion of oxalic acid from	0=
			solubilitymeasurement	
Mr Delwar	I	CHEMHT-IA	Chemical Thermodynamics-1:	07
$\Delta nsary$	1	Physical	Zeroth and 1st law of	07
7 Histi y		Chemistry-IA	Thermodynamics	
		CHEMHT-IA	Chamical Thermodynamics 1:	05
		Physical	Thermochemistry	05
		Chemistry-IA	Kinatia Theory and Gaseous	06
		Chemistry-IA	state	00
			State Vinatio Theory of good	
M. V N.	т		Kinetic Theory of gases	07
Mr. Yaseen Nuree	1	CEMHCC-1-2	General Treatment of Reaction	07
		Organic	Mechanism – I	
		Chemistry-1	Nechanistic classification:	o -
		Theory	Reactive intermediates:	07
			Stereochemistry-I	06
			Bonding geometries of carbon	
			compounds and representation	

			of molecules	
			Concept of chirality and	07
			symmetry:	
		CEMHCC-P-2	Separation	04
		Chemistry-1	Determination of boiling point	04
		Practical	Identification of a Pure Organic	08
			Compound by chemical test	
Mr. Md Muttakin	Ι	CEMHCC-T-2	Bonding and Physical	02
Sarkar		Organic	Properties	
		Chemistry-1	Valence Bond Theory	
		Theory	Electronic displacements	04
			MO theory	04
			Physical properties	03
			Stereochemistry-I	03
			Relative and absolute	
			configuration	
			Optical activity of chiral	04
			compounds	

Dr. Nabin Chandra	II	CHEMHT-3	Acid-Base Concepts and	8
Maity			Solvents	-
			Recapitulation of Arrhenius	
			concept. Bronsted-Lowry	
			concept. Solvent system	
			concept (in H_2O , lia, NH_3 , lia,	
			SO_2 and liq. HF). Lux-Flood	
			concept. Lewis concept	
			Drago-Wayland equation.	7
			Solvent levelling and	
			differentiating effects, Relative	
			strength of different acids and	
			bases, Pauling's rules,	
			Hammett acidity function and	
			super acids, HSAB principle	
			and its applications, Acid-base	
			equilibria in aqueous solution,	
			pH, Buffer, Acid-base	
			neutralization curves and	
			choice of indicators. Gas phase	
			acidity.	
			Quantitative Chemical	10
			Analysis	

			I. Estimation of Fe(II) using $K_2Cr_2O_7$ solution II. Estimation of Fe(III) using	
			$K_2Cr_2O_7$ and $KMnO_4$ solution	
			iii. Estimation of Ca^{2+} using	
			$KMnO^4$ solution iv. Estimation	
			of Cu^{2+} iodometrically v	
			Estimation of Cr^{3+} using	
			$K_2Cr_2O_7$ solution	
Mrs. Saleha	П	CEMHCC-T-3	Redox reactions and	06
Khatun		Inorganic Chemistry-	Precipitation reactions	00
		IB Theory	Qualitative idea about	
			complimentary.	
			noncomplimentary	
			disproportionation and	
			comproportionation reactions	
			standard redox potentials with	
			sign	
			conventions Electrochemical	
			series and its application to	
			explore the feasibility	
			of reactions and equilibrium	
			constants	
			Nernst equation: effect of pH	05
			complexation and precipitation	05
			on redox potentials formal	
			notential: Basis of	
			redox titration and redox	
			indicators Redox potential	
			diagrams (Latimer and	
			Frost) of common elements	
			and their applications	
			Solubility product principle	04
			common ion effect and their	04
			applications to the	
			precipitation and separation of	
			common metallic ions as	
			hydroxides sulphides	
			carbonates sulphates and	
			halides	
		CEMHCC-P-3	Estimation of Fe(II) using	01
		Inorganic Chemistry	$K_2Cr_2O_7$ solution	V 1
		Practical-IR	Estimation of Fe(III) using	01
			$K_2Cr_2O_7$ Solution	
			Estimation of Cu ²⁺ iodometrycally	02
1				

				01
			Estimation of Cr ³⁺ using	
-			K ₂ Cr ₂ O ₇ Solution	
Dr. Sandip Kumar	II	CHEMHT-3	Chemical kinetics	05
Rajak		Physical chemistry-IB	Rate law, order and	
			molecularity:	
			Chemical kinetics	07
			Role of Temperature and	
			theories of reaction rate:	
			Chemical kinetics	06
			Homogeneous catalysis:	
		CHEMHP-3	Study of kinetics of acid-	04
		Physical chemistry-IB	catalyzed hydrolysis of methyl	-
			acetate	
			Study of kinetics of	04
			decomposition of H_2O_2	01
			decomposition of H ₂ O ₂ .	
Mr Delwar	П	СНЕМНТ 3	Chamical Thermodynamics II:	05
Angery	ш	Dhysical chamistry ID	Second Law	05
Alisaly		r nysicai chennsu y-nb	Second Law	
			Chamical Thormodynamics II.	05
			Chemical Thermodynamics-II.	05
			Clausius inequality, Criteria for	
			spontaneity and equilibrium.	00
			Chemical Thermodynamics-II:	02
			Thermodynamic relations:	0.6
Mr. Sourajit	11	CEMHCC-T-4	Stereochemistry-II	06
Sarkar		Organic Chemistry-2	Stereochemistry-II	
		Theory	Concept of pro	04
			stereoisomerism:	04
			Conformation:	06
			Conformation:	00
			Substitution and Elimination	08
			Reactions	
			Elimination reactions:	10
		CEMHCC-P-4	Organic Preparations	18
		Organic Chemistry-2		
		Practical		
Mr. Md Muttakin	II	CEMHCC-T-4	General Treatment of Reaction	02
Sarkar		Organic Chemistry-2	Mechanism II	
			Reaction thermodynamics	
			Concept of one site still	02
			Concept of organic acids and	02
			Dases	0.1
			Tautomerism	04
			Reaction kinetics	05

	Substitution	and	Elimination	03
	Reactions			
	Free-radical		substitution	
	reaction			
	Nucleophilic		substitution	04
	reactions			

Dr. Sandip Kumar	III	CHEMHT-5	Transport processes	10
Rajak		Physical Chemistry –	Viscosity:	
		II	Transport processes	10
			Conductance and transport	
			number:	
			Foundation of Quantum	04
			Mechanics Beginning of	
			Quantum Mechanics:	
			Foundation of Quantum	06
			Wave function: Mechanics	
			Foundation of Quantum	05
			Mechanics	
			Concept of Operators:	
			Foundation of Quantum	05
			Mechanics	
			Particle in a box:	
		CHEMHP-5	Determination of partition	04
		Physical Chemistry –	coefficient for the distribution	
		II	of I ₂ between water andCCl ₄	
			Determination of K _{eq} for KI	04
			+ I_2 = KI ₃ , using partition	
			coefficient between water	
			and CCl ₄ .	
			Conductometric titration of an	04
			acid (strong, weak/monobasic,	
			dibasic) against strong base.	
Mr. Delwar	III	CHEMHT-5	Application of	03
Ansary		Physical Chemistry –	Thermodynamics-I: Partial	
		II	properties and chemical	
			potential:	
			Application of	03
			Thermodynamics-I: Chemical	
			Equilibrium:	
			Application of	03

			Thermodynamics-I:	
			Application of	04
			Thermodynamics-I: Nernst's	
			distribution law:	
			Chemical potential and other	04
			properties of ideal substances-	0.
			pure and mixtures. Pure ideal	
			gas.	
			Application of	03
			Thermodynamics I:	05
			Condensed Phase	
		CHEMID 5	Study of viscosity of unknown	04
		CHEIVIHP-3 Dhuaiaal Chamiatary	liquid (glycerol, sugar) with	04
		Physical Chemistry –	respect to water.	
		11	Application of	03
			Thermodynamics-I: Partial	00
			properties and chemical	
			potential.	
Dr. Nabin Chandra	Ш	CHEMHT-6	Chemical Bonding_II	14
Maity			Covalent Bond: Lewis	11
Whity			structures formal charge.	
			Qualitative idea of V B	
			Theory directional properties	
			of covalent bond. Concent of	
			Equivalent and non aquivalent	
			Equivalent and non equivalent	
			simple melecules and ions	
			(avagentian from main around)	
			(examples from main groups),	
			Stereochemically non-rigid	
			molecules – Berry's	
			pseudorotation, Resonance and	
			Dipole moments of inorganic	
			molecules and ions.	
			VSEPR theory and Bent's rule	14
			and their applications; M.O.	
			Theory (elementary pictorial	
			approach), concept of bond	
			order, MO diagram of homo-	
			nuclear diatomics $(1^{st} \text{ and } 2^{nd})$	
			period elements), hetero-	
			nuclear diatomics (HF, CO,	
			NO, NO ⁺ and CN^-) and	
			triatomics (H ₂ O and BeH ₂).	
			Electron sea model and	
			elementary idea about band	
			theory, classification of	
			inorganic solids and their	
			conduction properties	

			accordingtobandtheory;Hydrogenbonding:classifications, itseffect on thepropertiesofcompounds anditsimportanceinbiologicalsystems,VanderWaal'sforces.Metalextractionandpurification:BasicMetallurgyIdeaaboutoresand	10
			operations involved in metallurgy, Flow chart diagram for the extraction of pure Ti, Ni and U (including reactions) from their important	
		CHEMHP-6	ores and their uses. Quantitative inorganic analysis i. Estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution ii. Estimation of Fe(III) and Cu(II) in a given mixture using $K_2Cr_2O_7$ solution iii. Estimation of Cr(VI) and Mn(II) in a given mixture using $K_2Cr_2O_7$ solution iv. Estimation of Fe(III) and Cr(VI) in a given mixture using $K_2Cr_2O_7$ solution v. Estimation of Fe(III) and Cr(VI) in a given mixture using $K_2Cr_2O_7$ solution v. Estimation of Fe(II) and Mn(II) in a given mixture using KMnO ₄ solution vi. Estimation of Fe(III) and Ca(II) in a given mixture using KMnO ₄ solution	10
Mrs. Saleha Khatun	III	CEMHCC-T-6 Inorganic Chemistry- II Theory	Ionic Bond: Lattice energy, Born-Lande equation with derivation and importance of Kapustinskii expression for lattice energy	05
			Born-Haber cycle and its applications, Polarising power and polarisability of ions, Fajan's rules and its applications	05

			radius ratio rules – its	05
			applications and limitations,	
			salvation energy and solubility	
			energetics of dissolution	
			process;	
			Packing in crystals, voids in	05
			crystal lattice, packing	
			efficiency, Structure of ionic	
			solids: rock salt, zinc blende,	
			wurtzite, fluorite, antifluorite,	
			perovskite and layer lattice.	
			Qualitative idea about	02
			stoichiometric and non-	
			stoichiometric crystal defects.	
		CEMHCC-P-6	Estimation of Fe(II) and	02
		Inorganic Chemistry-	Fe(III) in a given mixture	
		II Practical	using $K_2Cr_2O_7$ solution	
			Estimation of Cu(II) and	02
			Fe(III) in a given mixture	
			using $K_2Cr_2O_7$ solution	^
			Estimation of Cr(VI) and	02
			Fe(III) in a given mixture	
			using $K_2Cr_2O_7$ solution	0.2
			Estimation of Ca(II) and	02
			Fe(III) in a given mixture	
Mr. Vacaan Nuraa	TIT	CEMUCC T 7	Carbonyl and Palatad	00
wir. I aseen Nuree	111	Organia Chamistry 2	Carbollyl and Related	09
		Theory	Addition to $C-O$	
		Theory	Exploitation of acidity of g-H	08
			of C=O	00
			Elementary ideas of Green	03
			Chemistry	
			Nucleophilic addition to α , β -	03
			unsaturated carbonyl system:	
			Nucleophilic addition to α,β -	
			unsaturated carbonyl system:	
			Substitution at sp2 carbon	03
			(C=O system)	
		CEMHCC-P-7	Qualitative Organic Analysis	16
		Organic Chemistry-3	of single solid organic	
		Practical	compound	0.7
Mr. Md Muttakin	III	CEMHCC-T-7	Chemistry of alkenes and	06
Sarkar		Organic Chemistry-3	alkynes	
		Theory	Addition to C=C	<u></u>
			Addition to $C \equiv C$ (in	04
			comparison to $C=C$)	

			CEMHCC-	P-7	Aromatic Substitution	04
			Organic Ch	emistry-3	Electrophilic aromatic	
			Practical		substitution	
					Organo-metallics	04
					Free-radical substitution	
					Reaction	
Mr.	Sourajit	III	SEC-1B		Introduction	04
Sarkar			Basic	Analytical		
			Chemistry		Complexometry	02
					Soil Analysis	02
					Analysis of water	03
					Analysis of food products	03
					Chromatography	03
					Ion-exchange	02
					Analysis of cosmetics	03
					Suggested Applications (Any one)	02
					Suggested Instrumental demonstrations	03

Dr. Sandip Kumar	IV	CHEMHT-8		Application of	08
Rajak		Physical C	Chemistry-	Thermodynamics – II:	
		III		Colligative properties:	
				Application of	06
				Thermodynamics – II: Phase	
				rule:	
				Application of	06
				Thermodynamics – II: Binary	
				solutions:	
				Quantum Chemistry	06
				Angular momentum:	
				Quantum Chemistry	08
				Qualitative treatment of	
				hydrogen atom and hydrogen-	
				like ions	
				Quantum Chemistry	06
				LCAO and HF-SCF:	
		CHEMHP-8	3	Determination of solubility of	02
		Physical Ch	emistry –	sparingly soluble salt in water,	
		II		ions and in neutral electrolyte	

			(using common indicator).	
			pH-metric titration of acid	02
			(mono-and di-basic) against	
			strong base.	
			Determination of K _{sp} for AgCl	02
			by potentiometric titration of	
			AgNO ₃ solution against	
			standard KCl solution.	
Mr. Delwar	IV	CHEMHT-8	Electrical Properties of	08
Ansary		Physical Chemistry-	molecules:	
		III	Ionic equilibria	
		CHEMHP-8	Electrical Properties of	06
		Physical Chemistry –	molecules:	
		II	Electromotive Force:	
			Electrical Properties of	06
			molecules:	
			Dipole moment and	
			polarizability	
			Potentiometric titration of	02
			Mohr's salt solution against	
			standard K_2Cr_2O -solution.	
			Effect of ionic strength	02
		CHEMHT-8	on the rate of	
		Physical Chemistry-	Persulphate –Iodide	
		III	reaction.	
				0.0
			Study of phenol-water	02
			phase diagram.	
			Electrical Properties of	08
			molecules:	00
			Ionia aquilibria	
Dr. Nohin	W	СНЕМИТ О	Padioactivity and Nuclear	8
Chandra Maity	1 V		Chemistry	0
			Atomic nucleus nuclear	
			stability n/n ratio and different	
			modes of decay mass defect	
			nodes of decay, mass defect,	
			binding energy Nuclear forces	
			Meson exchange theory	
			elementary idea of nuclear	
			shell model and magic	
			numbers, Fission, fusion and	
			spallation reactions, artificial	
			radioactivity, super heavy	
			elements and their IUPAC	

		nomenclature. Moderators,	
		slow and fast neutrons,	
		Applications of radio-isotopes	
		in: determination of structures.	
		establishment of reaction	
		mechanisms and radio-carbon	
		deting heards of rediction and	
		safety massures	
		Chamistry of a and n block	7
		Chemistry of s and p-block	/
		elements	
		Diagonal relationship (Li-Mg;	
		B-S1) and anomalous behavior	
		of first member of each group,	
		Allotropy and catenation	
		(examples of C, P and S	
		compounds). Study of the	
		following compounds with	
		emphasis on preparation,	
		properties, structure and	
		bonding: Berylium hydrides	
		and halides; diborane;	
		borazine; boron nitride, boric	
		acid, borax, fluorocarbons	
		(with environmental effect);	
		oxides and oxyacids of	
		nitrogen, phosphorous, sulphur	
		and chlorine. Peroxo acids of	
		sulphur:	
		trtranitride: interbalogens	
		nseudobalogens, polybalides	
		fluoridae and oxidae of xanon	
		Nuclear and oxides of xenon.	
		Noble gas clathrates; basic	
		properties of iodine. Synthesis,	
		structural aspects and	
		applications of silicones and	
		phosphazines; Structural	
		properties of various silicates.	
	CHEMHP-9	Complexometric Titration	10
		Inorganic Preparation	
Mrs. Saleha IV	CEMHCC-T-9	Coordination Chemistry-I	03
Khatun		Idea about double salts and	
		complex salts, Werner's theory	
		complex salts, Werner's theory EAN rule, classification of	03
		complex salts, Werner's theoryEAN rule, classification ofligands and their binding	03
		complex salts, Werner's theory EAN rule, classification of ligands and their binding modes	03
		complex salts, Werner's theory EAN rule, classification of ligands and their binding modes IUPAC nomenclature of	03

			two metal centres)	
			overall and stepwise stability	03
			constants, chelates, inner	
			metallic complexes	
			Stereochemistry and	03
			isomerism (constitutional and	00
			stereo) of complexes with	
			coordination no 4 and 6	
		CEMHCC_P_0	Complexometric Titration:	04
		CLIVITICC-I-9	i)Estimation of Hardness of	04
			Weter	
			$ii)$ Estimation of $C_2(II)$ and	
			$M_{\alpha}(\mathbf{H})$ in a minimum	
				02
			Inorganic Preparation:	02
			1)Mohr's Salt	
			11)Tetraamminecarbonatocobalt	
			(III) trihydrate	
Mr. Sourajit	IV	CEMHCC-T-10	Nitrogen Compounds	03
Sarkar		Organic Chemistry-4	Amines: Aliphatic &	
		Theory	Aromatic:	
			Nitro compounds (aliphatic	02
			and aromatic):	
			Alkylnitrile and isonitrile	02
			The und isometrie	02
			Diazonium salts and their	02
			related compounds	
			The Logic of Organic	08
			Synthesis	
			Retrosynthetic analysis:	
			Strategy of ring synthesis:	04
			Asymmetric synthesis:	06
		CEMHCC-P-10	Organic Quantative Estimation	14
		Organic Chemistry-4		
		Practical		
Mr. Md Muttakin	IV	CEMHCC-T-10	Rearrangements: Mechanism	03
Sarkar		Organic Chemistry-4	with evidence and	
~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~			stereochemical Features for	
			the following	
			Rearrangement to electron-	
			deficient carbon	
			Rearrangement to electron-	01
			deficient nitrogen	01
		CEMHCC_P_10	Rearrangement to electron	02
		Organic Chemistry_A	deficient oxygen	02
		Dractical	Aromatia rearrangements	01
		i iacucai	Anomatic rearrangements	01

			Migration from nitrogen to ring carbon	01
			Rearrangement reactions by green approach	01
			Organic Spectroscopy	02
			UV Spectroscopy	
			IR Spectroscopy	02
			NMR Spectroscopy	05
Mr Sourajit Sarkar	IV	SEC-1B	Drugs & Pharmaceuticals	08
	CH	CHEMIIS 24	Introduction	
		CHEWING - 2A	Fermentation	06
		Pharmaceutical	Hands On Practical	06
		Chemistry		

Dr. Nabin	V	CHEMHT-11	Magnetochemistry	12
Chandra Maity			Classification of magnetic	
			substances, Origin of para	
			magnetic moments,	
			temperature dependence of	
			para magnetism – Curie and	
			Curie-Weiss law, TIP,	
			magnetic susceptibility and its	
			measurement (Gouy method),	
			diamagnetic correction,	
			effective magnetic moment,	
			spin only moment for 3d	
			metals, Orbital contribution to	
			magnetic moment, spin-orbit	
			coupling, quenching of orbital	
			contribution, Sub-normal	
			magnetic moments and	
			antiferromagnetic interactions	
			(elementary idea with	
			examples).	
			Chemistry of d- and f-block	12
			elements	
			d-block elements:	
			Characteristic properties,	
			Comparison among the	
			elements of 3d series with	

			reference to electronic	
			configuration, oxidation states	
			and E^0 values; General	
			comparison between 3d, 4d	
			and 5d series elements in term	
			of electronic configuration.	
			oxidation states atomization	
			energy magnetic properties	
			and coordination chemistry f_{-}	
			block elements: Comparison	
			botween d and f block	
			alements: Electronic	
			elements, Electronic	
			configuration, oxidation states,	
			variation of magnetic	
			properties (Ln ³⁺), atomic and	
			ionic (3+) radii of lanthanoids;	
			consequences of lanthanide	
			contraction, separation of	
			lanthanides by ion exchange	
			and solvent extraction	
			methods; comparison between	
			lanthanoids and actinoids.	
		CHEMHP-11	Quantitative estimation	10
			A. Quantitative: i. Estimation	
			of available chlorine in	
			bleaching powder using	
			iodometry ii. Estimation of	
			available oxygen in pyrolusite	
			using permanganometry iii.	
			Estimation of Cu in brass using	
			iodometry iv Estimation of Fe	
			in cement using	
			ni coment using	
			Estimation of chlorida	
			arovimatrically vi Estimation	
			of Ni(II) using DMC	
			of NI(II) using DMG	
			gravimetrically B.	
			Experiment:	
			1. Paper chromatographic	
			separation of Ni(II) and Co(II)	
			11. Measurement of 10Dq by	
			spectrophotometric method iii.	
			Preparation of Mn(acac)3 and	
			determination of its λmax	
			colorimetrically	
Mrs. Saleha	V	CEMHCC-T-11	structure and bonding of	04
Khatun		Inorganic chemistry-	coordination compounds on	

III Theory	the basis of V. B. Theory	
5	and its limitations.	
Coordination	Elementary idea about CFT.	06
Chemistry-II	splitting of d ⁿ configuration in	
	ML4 to ML6 and ML8	
	systems factors affecting	
	measurement of o	
	spectrochemical series of	
	ligondo	
	CESE in weak and strong	02
	CFSE III weak and strong	02
	neids, OSSE, High	
	spin and low spin complexes,	
	spin isomerism,	0.5
	tetragonal distortion, Jahn	06
	Teller	
	theorem and applications,	
	achievements and limitations	
	of CFT, nephalauxetic	
	effect, stabilisation of	
	unusually high and low	
	oxidation states of 3d series	
	elements	
	MOT (elementary idea), σ and	04
	π bonding in octahedral	
	complexes (a	
	pictorial approach). Colour and	
	electronic spectra of	
	complexes: selection rules	
	for electronic transitions, d-d	
	transition, charge transfer	
	transition (qualitative idea)	
	L-S coupling and R-S ground	06
	state term for atomic no up to	00
	30	
	qualitative ORGEL diagram	
	for $3d1 - 3d9$ jons with	
	appropriate symbols for the	
	energy levels	
CEMHCC P 11	Estimation of available	01
Leonania Chamistry	chloring in bloophing pourder	01
IV Drastical	using iodometry	
IV Practical	Using iodoinetry	02
	Estimation of available oxygen	02
	in pyrolusite using	
	permanganometry	0 -
	Estimation of Fe in cement	02
	using permanganometry	
	Estimation of Ni(II) using	01

			DMG gravimetrically	
			Estimation of chloride	01
			gravimetrically	
Dr. Sandip Kumar	V	CHEMHT-12	Molecular Spectroscopy	04
Rajak		Physical Chemistry –	Interaction of electromagnetic	
		IV	radiation	
			Molecular Spectroscopy	06
			Rotation spectroscopy:	
			Vibrational spectroscopy:	06
			Molecular Spectroscopy	04
			Raman spectroscopy:	
			Molecular Spectroscopy	04
			Nuclear Magnetic Resonance	
			(NMR) spectroscopy,	
			Electron Spin Resonance	
			(ESR) spectroscopy:	
			Surface phenomenon	06
			Surface tension and energy:	
			Surface phenomenon	06
			Adsorption:	
			Surface phenomenon	06
			Colloids:	
		CHEMHP-12	Verification of Beer and	02
		Physical Chemistry –	Lambert's Law for KMnO ₄ and	
		IV	K ₂ Cr ₂ O ₇ solution	
			Study of kinetics of $K_2S_2O_8+$	02
			KI reaction,	
			spectrophotometricany.	
			Determination of CMC from	02
			surface tension	02
			measurements.	
Mr. Delwar	V	CHEMHT-12	Phtochemistry:	06
Ansary		Physical Chemistry –	Lambert-Beer's law	
		IV	Photochemistry:	06
			Photochemical Processes	
			Photochemistry:	06
			Rate of Photochemical	
			processes	
		CHEMHP-12	Determination of surface	02
		Physical Chemistry –	tension of a liquid using	
		IV	Stataginometer.	
			Determination of pH of	02
			unknown buffer.	02
			spectrophotometrically.	

Dr. Nabin	V	CHEMHTDSE-1B	Silicate Industries	9
Chandra Maity		Inorganic Materials of	Fertilizers	9
		Industrial Importance	Surface Coatings	9
			Batteries	9
			Alloys	9
			Catalysis	9
			Chemical explosives	6
Mr. Yaseen Nuree	V	CEMH-DSE-T-2C	Twelve principles of Green	06
		Green Chemistry	Chemistry	
		Theory	Prevention/ minimization of	05
			hazardous/ toxic products	
			Energy requirements for	05
			reactions – alternative sources	
			of energy	
			Prevention of chemical	06
			accidents designing greener	
			processes	
			Future Trends in Green	04
			Chemistry	
			Oxidation reagents and	
		CEMH DSE D 2C	Groop Chamistry Practical	15
		Green Chemistry	Oreen Chemistry Flactical	15
		Dractical		
		Tractical		
Mr. Md. Muttakin	V	CEMHDSE-T-2C	Green Chemistry	05
Sarkar	·	Green Chemistry	Introduction to Green	
		5	Chemistry	
			Examples of Green Synthesis/	10
			Reactions and some real-	
			World cases	
		CEMHDSE-T-2C	Green Chemistry Practical	05
		Green Chemistry		
		Theory		

Dr. Nabin	VI	CHEMHT-13	Bio-inorganic Chemistry	25
Chandra Maity			Essential elements of life, Role	
			of metal ions in living systems-	
			a brief review, Elementary idea	
			about proteins, enzymes and	
			ionophores; Structure of ATP,	

			Na ⁺ ion pump and transport of	
			Na ⁺ and K^+ across cell	
			membrane; active site	
			structures and bio-functions of	
			haemoglobin, myoglobin,	
			carboxy peptidase A carbonic	
			anhydrase B cytochrome c	
			ferredoxins and chlorophyll:	
			biological nitrogen fixation:	
			toxic metals (Ph Cd and Hg)	
			and their offects Wilson	
			discose cholotion therepy	
			disease, cheration therapy;	
			platinum and gold complexes	
			as drugs (examples only).	
			Organometallic chemistry and	25
			catalysis	
			Definition, Classification of	
			organometallic compounds,	
			hapticity of ligands,	
			nomenclature, 16- electron &	
			18-electron rule and its	
			applications; preparation and	
			structure of mono- and bi-	
			nuclear carbonyls of 3d series,	
			synergic effect of CO and use	
			of IR data to explain extent of	
			back bonding. General	
			methods of preparation of	
			metal-carbon σ -bonded	
			applayee Zaise's selt Matel	
			complexes, Zeise's sait, Wetai-	
			Carbon multiple bonding;	
			Preparation, structures,	
			properties and reactions of	
			ferrocene; elementary idea	
			about oxidative addition,	
			reductive elimination, insertion	
			reactions; Study of the	
			following catalytic processes:	
			alkene hydrogenation	
			(Wilkinson's catalyst),	
			hydroformylation, Wacker	
			process, Synthetic gasoline	
			(Fischer Tropsch reaction) and	
			Olefin polymerization reaction	
			(Ziegler-Natta catalyst)	
		CHEMHP-13	Qualitative semimicro analysis	10
Mrs. Saleha	VI	CEMHCC-T-13	Symmetry as a universal	02
Khatun			theme, concept of symmetry	

Molecular Symmetry and Point group	elements and operations (with examples):	
	symmetry properties of atomic orbitals (s, p and d);	02
	identification of molecular point groups in some simple molecules and ions;	04
	applications of symmetry for polarity and chirality.	02
Bio-inorganic Chemistry	Essential elements of life, Role of metal ions in living systems- a brief review, Elementary idea about proteins, enzymes and ionophores; Structure of ATP, Na+ ion pump and transport of Na+ and K+ across cell membrane:	06
	active site structures and bio-functions of haemoglobin, myoglobin,	03
	carboxy peptidase A, carbonic anhydrase B, cytochrome c, ferredoxins and chlorophyll; biological nitrogen fixation;	06
	toxic metals (Pb, Cd and Hg) and their effects, Wilson disease,	04
	chelation therapy; platinum and gold complexes as drugs (examples only)	04
CEMHCC-P-13 Qualitative semimicro analysis	Qualitative semimicro analysis of mixtures containing four radicals (excluding oxide and carbonate). Emphasis should be given to the understanding of the chemistry of different reactions and to assign the most probable composition. Basic Radicals: K ⁺ , NH4 ⁺ , Mg ^{2+,} Ca ²⁺ , Ba ²⁺ , Sr ²⁺ , Al ³⁺ , Cr ³⁺ , Mn ²⁺ , Fe ³⁺ / Fe ²⁺ , Co ²⁺ , Ni ^{2+,} Cu ²⁺ , Zn ²⁺ , Pb ^{2+,} Cd ²⁺ , Bi ³⁺ , Sn ²⁺ / Sn ⁴⁺ , As ³⁺ /As ^{5+,} Sb ^{3+/}	06

			Sb ⁵⁺	
			Acid Radicals: Cl^{-} Br ⁻ l^{-} S ^{2-,}	02
			SO_4^{2-} $S_2O_2^{2-}$ $SCN^ NO_2^{-}$	° -
			NO_{2}^{-} BO_{3}^{3-} PO_{4}^{3-} As O_{4}^{3-} and	
			$H_{3}BO_{3}$	
			Insoluble Materials: $Cr_2O_2(i\sigma)$	03
			$Fe_2O_2(ig)$ Al_2O_2 SnO_2	05
			$PbSO_4 BaSO_4 SrSO_4$	
Mr Souraiit	VI	CEMHCC-T-14	Carbocycles and Heterocycles	06
Sarkar	V 1	Organic Chemistry-A	Polynuclear hydrocarbons and	00
Sarka		Theory	their derivatives	
		Theory	Heterocyclic compounds	04
			Therefore yeare compounds	04
			Synthesis (including	04
			retrosynthetic approach and	
			mechanistic details)	
			Pyridine	06
			Cyclic Stereochemistry	06
			Alicyclic compounds	
		CHEMHCC-P-14	Chromatographic Separations	08
		Organic Chemistry-4	Spectroscopic Analysis of	06
		Practical	Organic Compounds	
Mr. Md Muttakin	VI	CEMHCC-T-14	Pericyclic reactions	03
Sarkar		Organic Chemistry-4	Mechanism, stereochemistry,	
		Theory	regioselectivity in case of	
		-	Electrocyclic reactions	
			Cycloaddition reactions	02
			Sigmatropic reactions	02
		CHEMHCC-P-14	Carbohydrates	05
			Monosaccharides,	
			disaccharides, polysaccharides	
			Biomolecules	05
			Amino acids, peptides	
			, , , , , , , , , , , , , , , , , , ,	
			Chromatographic Separations	05
Dr. Sandip Kumar	VI	CHEMHTDSE-3	Statistical Thermodynamics	06
Rajak		Advanced Physical	Configuration:	
5		Chemistry	Statistical Thermodynamics	06
			Boltzmann distribution:	
			Statistical Thermodynamics	06
			Partition function:	
			Special selected topics	07
			Specific heat of solid:	
			Special selected topics	07
			3rd law:	

		-		
			Special selected topics	07
			Polymers	
		CHEMHTDSE-3	Roots of equations: (e.g.	02
		Advanced Physical	volume of van der Waals gas	
		Chemistry	and comparison with ideal gas,	
			pH of a weak acid).	
			Numerical differentiation	02
			(e.g., change in pressure	
			for small change involume	
			potentiometric titrations)	
			potentiometrie titutions).	
			Numerical integration (e.g.	02
			entropy/ enthalpy changes	
			from heat capacity data),	
			probability distributions (gas	
			kinetic theory) and mean	
			values.	
Mr. Delwar	VI	CHEMHTDSE-3	Crystal Structure: Bravais	08
Ansary		Advanced Physical	Lattice and Laws of	
		Chemistry	Crystallography:	
			Crystal Structure:	06
			Crystal planes:	
			Crystal Structure:	06
			Determination of crystal	
			structure	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	I	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	T	CHEMG-T-01	A cids and bases	03
Derwar Ansary	1		Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents.	
			Acids and bases Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.	03
			Acids and bases Hard and soft acids and bases (HSAB concept), applications of HSAB process.	02
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic Chemistry 1.Electronic displacements	05
			2.Stereochemistry	05

2020 21	-	
	3. Nucleophilic Substitution and Elimination Reactions	04
CHEMGP-1	Qualitative Analysis of Single	05
Organic	Solid Organic Compound(s)	
Chemistry -1		

Saleha Khatun	II	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			a) Ionic Bonding	
			b) Covalent Bonding	07
			c) MO Approach	07
			Comparative study of p-block	04
			elements :	
			a)Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	
			iii. N-P-As-Sb-Bi	02
			iv. O-S-Se-Te	
			v. F-Cl-Br-I	
		CHEMG-P-02	Qualitative semi-micro	03
			analysis of mixtures	
			containing three radicals.	
			Emphasis should be given	
			to the understanding of the	
			chemistry of different	
			reactions.	
			Acid Radicals: Cl^- , Br^- , I^- , NO_2^-	
			$, NO_3^{-}, S^{2-}, SO_4^{2-}, BO_3^{3-},$	
			H ₃ BO ₃ .	
			Basic Radicals: Na^+ , K^+ , Ca^{2+} ,	02
			Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} ,	
			$N1^{2+}, Cu^{2+}, NH4^+.$	10
Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	~ ~
			Liquids	05

		Distribution of S	Syllabus	
		Department Of C	hemistry	
		Dumkal Col	lege	
		2020-21		
		CHEMG-P-02	Surface tension measurement (use of organic solvents excluded)	02
			Viscosity measurement (use of organic solvents excluded)	02
Md Muttakin	II	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent and	
			solvent, differentiating and	
			levelling solvents.	
			Acids and bases	03
			Lewis acid-base concept,	
			classification of Lewis acids	
			and bases, Lux-Flood concept	
			and solvent system concept.	
			Acids and bases	02
			Hard and soft acids and bases	
			(HSAB concept),	
			applications of HSAB	
			process.	
			1	
			Aliphatic Hydrocarbons	02
			Introduction	
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
			Estimation of evalua said by	00
		CHEMG-P-01	titrating it with KMnQ	02
			turaung it with KivinO4.	
			Estimation of Cu (II) ions	02
			iodometrically using $Na_2S_2O_3$.	
Saleha Khatun	III	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09

		2020 21		
			Redox Reactions	04
			Estimation of Fe(II) ions with	01
		CHEMG-P-01	$K_2Cr_2O_7$	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Md Muttakin	III	CHEMG-T-01	Fundamentals of Organic	05
Sarkar			Chemistry	
			1.Electronic displacements	
			2.Stereochemistry	05
			3. Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic Chemistry -1	Solid Organic Compound(s)	

Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	05
			Liquids	05
			(use of organic solvents excluded)	02
		CHEMG-P-02	Viscosity measurement (use of	02
			organic solvents excluded)	•
Saleha Khatun	IV	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			d) Ionic Bonding	
			Covalent Bonding	07
			MO Approach	07
			Comparative study of p-block	04
			elements :	
			a)Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	

		Distribution of S Department Of C Dumkal Col 2020-21	Syllabus hemistry lege	
			iii. N-P-As-Sb-Bi iv. O-S-Se-Te v. F-Cl-Br-I	02
		CHEMG-P-02	Qualitativesemi-microanalysis of mixtures containingthreeradicals.Emphasisshould be giventotothe understanding of thechemistryofdifferentreactions.Acid Radicals:Cl ⁻ , Br ⁻ , I ⁻ , NO2 ⁻ , NO3 ⁻ , S2 ⁻ , SO42 ⁻ , BO33 ^{-,} H3BO3.	03
			Basic Radicals: Na^+ , K^+ , Ca^{2+} , Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} , Ni^{2+} , Cu^{2+} , NH_4^+ .	02
Md Muttakin	IV	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	Ι	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent	
			and solvent, differentiating and	
			A gidg and bases	02
			Actus and bases	05
			classification of Lewis acids	
			and bases Lux-Flood concept	
			and solvent system concept	
			Acids and bases	02
			Hard and softacids and bases	02
			(HSAB concept), applications	
			of HSAB process.	
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to5 Carbons)	03
			Alkenes:(upto5 Carbons).	04
			Alkynes:(upto5 Carbons)	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu(II)ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic	05
			Chemistry	
			Electronic displacements	
			Stereochemistry	05
			Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Oualitative Analysis of Single	05
		Organic	Solid Organic Compound(s)	
		Chemistry -1		

Molecular structure:a)Ionic Bondingb)Covalent Bonding07	,
a)Ionic Bondingb)Covalent Bonding07	,
b) Covalent Bonding 07	,
c) MO Approach 07	
Comparative study of p-block 04	•
elements:	
a) Group trends in electronic	
configuration, modification of	
pure elements,	
b) Common oxidation states, 04	
inert pair effect, and their	
important compounds in	
respect of the following groups	
of elements	
i. B-Al-Ga-In-Tl	
ii. C-Si-Ge-Sn-Pb	
iii. N-P-As-Sb-Bi 02	
iv. O-S-Se-Te	
v. F-Cl-Br-I	
CHEMG-P-02 Qualitative semi-micro 03	
analysis of mixtures	
containing three radicals.	
Emphasis should be given	
to the understanding of the	
chemistry of different	
reactions. Acid Radicals: Cl ² ,	
$Br^{2}, \Gamma, NO_{2}^{2}, NO_{3}^{2}, S^{2}, SO_{4}^{2},$	
$BO_3^{3,7}$ H ₃ BO ₃ .	
Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ , 02	
Sr^{2} , Ba^{2} , Cr^{3} , Mn^{2} , Fe^{3} ,	
$N1^{2+}, C1^{2+}, NH4^{2+}.$	
Delwar Ansary II CHEMG-1-02 Kinetic Theory of Gases and 12	
Real gases	
Liquids 05	
CHEMG-P-02 Surface tension measurement 02 (use of organic solvents	
excluded)	
Viscosity measurement (use of 02	,
organic solvents excluded)	
MdMuttakin II CHFMG-T-02 Solids 05	
Sarkar Chemical kinetics 05	
CHEMG-P-02 Viscosity measurement (use of 02	
$\begin{array}{c} \text{Charlies 1 62} \\ \text{Physical Chemistry} = I \\ \text{organic solvents excluded} \end{array}$,

Nabin Chandra			Ionic Equilibria	09
Maity	TTT	CHEMG-T-03	Aryl Halides	04
	111	CHEMG-P-03	Determination of enthalpy of hydration of copper sulphate	02
	III	CHEMG-T-03	Chemical Energetics	12
Delwar Ansary			Carbonyl Compounds	07
		CHEMG-P-03	Determination of heat capacity of calorimeter for different volumes	02
			Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	02
Saleha Khatun	III	CHEMG-T-03	Chemical Equilibrium	09
			Alcohols, Phenols and Ethers	08
		CHEMG-P-03	Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH meter and compare it with the indicator method	02
			Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) a. Sodium acetate-acetic acid b. Ammonium chloride- ammonium hydroxide	02
Md Muttakin	III	CHEMG-T-03	Aromatic hydrocarbons	06
Sarkar			Organometallic compounds	04
		CHEMGP-3 Organic Chemistry -1	Identification of a pure organic compound	04

Nabin Chandra		CHEMG-T-04		10
Maity	IV		Coordination Chemistry	
			Crystal Field Theory	10
		CHEMG-P-04	Complexometric estimation	02
			of (i) Mg2+ or (ii) Zn2+	
			using EDTA.	
			Preparation of any two of	01
			the following complexes:	
			a.tetraammine	

			carbonatocobalt (III) nitrate	
Delwar Ansary	IV	CHEMG-T-04	Phase Equilibrium	07
		CHEMG-P-04	Study of the equilibrium of one of the following reactions by the distribution method: $I_2(aq) +I^-(aq) = I^-$ (aq)	02
			Perform the following potentiometric titrations: Weak acid vs. strong base	02
			Potassium dichromate. Mohr's salt	02
Saleha Khatun	IV	CHEMG-T-04	Conductance	08
			Transition Elements (3d Series)	10
		CHEMG-P-04	Preparation of any two of the following complexes: b. tetraamminecopper(II) sulphate	01
			c. potassium trioxalatochromate(III) trihydrate	01
			d. potassium bisoxalatocuprate(II) trihydrate	01
Md Muttakin	IV	CHEMG-T-04	Solutions	05
Sarkar			Electromotive force	05
		CHEMG-P-4	conductometric titrations:	02
			Strong acid vs. strong base	
Nabin Chandra	V	CHEMGTDSE-1	Chemical Analysis	14
Maity		CHEMGPDSE-1	To find the total hardness of water by EDTA titration	02
			Determination of the strength of the H2O2 sample	02
Delwar Ansary	V	CHEMGTDSE-1	Error Analysis and Computer Applications	12
		CHEMGPDSE-1	To determine the rate constant for the acid catalysed hydrolysis of an ester.	02

			TitrationofHClandCH ₃ CO	02
			OHmixturevsNaOHusingt	
			wodifferentindicatorstofin	
			dtheconcentration.	
Saleha Khatun	V	CHEMGTDSE-1	Industrial Chemistry	18
		CHEMGPDSE-1	Titration of Na2CO3 and	02
			NaHCO3 mixture vs HCl	-
			using phenolphthalein and	
			methyl orange	
			indicators	
Md Muttakin	V	CHEMGTDSE-1	Environmental Chemistry	16
Sarkar	·	CHEMGPDSE-1	Estimation of available	02
Burkur			oxygen in pyrolusite	02
Nahin Chandra	VI	CHEMGTDSE_2	Polymers	04
Maity	V I	CHEWIOTDSE-2		04
Waity			F allits Verniches	03
				02
			Fats and Oils	03
		CHEMGPDSE-2	Purification of the crude	02
			product is to be made by	
			crystallisation from	
			water/alcohol	
			Estimation of	02
			saponification value of oil	
			/ ester / fat.	
Delwar Ansary	VI	CHEMGTDSE-2	Amines and Diazonium	10
			Salts	
			Amino Acids and	10
			Carbohydrates	
		CHEMGPDSE-2	Hydrolysis of	02
			amides/imides	
			Acetylation of aromatic	02
			amines	
Saleha Khatun	VI	CHEMGTDSE-2	Synthetic dyes	02
			Drugs and	03
			Phermaceuticals	
			Pesticides	03
			Fermentation Chemicals	03
		CHEMGPDSE-2	Estimation of acetic acid in	01
			commercial vinegar	
			Estimation of amino acid	02
			by formol titration	
Md Muttakin	VI	CHEMGTDSE-2	Carboxylic Acids and	06
Sarkar			Their	
			Derivatives	
			Industrial Chemistry	02
			Food additives	
		CHEMGPDSE-2	Nitration of aromatic	02
		-	compounds	

	Purification of the crude	01
	product is to be made by	
	crystallization from	
	water/alcohol.	

Name of Teacher	Semester	Paper	Content	No. of
		_		Lecture
Mrs Saleha Khatun	Ι	CEMHCC-TH-1	Periodic properties	7
			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept, Heisenberg's	
			uncertainty principle and its	
			significance.	
			Time independent	7
			Schrödinger's wave equation	,
			(without application and	
			solution detail) Significance of	
			w and w? Radial and angular	
			ψ and $\psi 2$, Radial and angular wave functions for hydrogen	
			atom (qualitative idea) radial	
			probability distribution curves	
			shapes of s n d and f orbitals	
			(qualitative idea) Quantum	
			(qualitative luca), Qualitutii	
			Deuli's evolution minimized	
			Author minimized	
			Auldau principle and	
			limitations, Hund's rules,	
			exchange energy, electronic	
			configurations of atoms.	
			Elementary idea of microstates.	10
			Acidimetry and alkalimetry	10
Mrs. Saleha	Ι	CEMHCC-TH-1	Inorganic chemistry-I Theory	06
Khatun			Extranuclear structure of atom	
			Bohr's model and atomic	
			spectrum of hydrogen,	
			Limitations of Bohr's model	
			and Sommerfeld's	
			modifications, de Broglie's	
			concept, Heisenberg's	
			uncertainty principle and its	
			significance, Time independent	
			Schrödinger's wave equation	
			(without application and	
			solution detail)	
			Significance of ψ and $\psi 2$,	04
			Radial and	
			angular wave functions for	
			hydrogen atom (qualitative	
			idea), radial probability	

			distribution curves, shapes of s,	
			p, d and f orbitals (qualitative	
			idea)	
			Quantum	04
			numbers and their significance	01
			Deuli's evolution principle	
			Author principle and	
			limitations, Hund's rules,	
			exchange energy, Electronic	
			configurations of atoms.	
			Elementary idea of microstates	02
		CEMHCC-P-1	Method of Preparation of	02
		Inorganic	standard solutions of titrants	
		Chemistry-IA	Estimation of Carbonate and	02
		practical	hydroxide present together in a	
		-	mixture	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Dr. Sandin Kumar	I	CHEMHT-IA	Kinetic Theory and Gaseous	06
Rajak	•	Physical	state	00
Rajak		Chemistry-IA	Kinetic Theory of gases	
		Chemistry III	Maxwell's distribution of speed	06
			and anargy	00
			Deal and virial equation	06
			Real gas and virial equation	00
		CHEMHP-IA	Determination of near of	02
		Physical	heuralization of a strong actu	
		Chemistry-IA	by a strong base.	
			Determination of heat of solute	02
			betermination of near of solute	02
			Ion of oxanc actu nom	
M D I	T		solubilitymeasurement	07
Mr. Delwar	1	CHEMHI-IA	Chemical Thermodynamics-1:	07
Ansary		Physical	Zeroth and 1st law of	
		Chemistry-IA	Thermodynamics	
		CHEMHT-IA	Chemical Thermodynamics-1	05
		Physical	: Thermochemistry	
		Chemistry-IA	Kinetic Theory and Gaseous	06
			state	
			Kinetic Theory of gases	
Mr Sourajit Sarkar	Ι	CEMHCC-T-2	General Treatment of Reaction	07
		Organic	Mechanism – I	
		Chemistry-1	Mechanistic classification:	
		Theory	Reactive intermediates:	07
			Stereochemistry-I	06
			Bonding geometries of carbon	
			compounds and representation	

			of molecules	
			Concept of chirality and	07
			symmetry:	
		CEMHCC-P-2	Separation	04
		Organic Chemistry-1	Determination of boiling point	04
		Practical	Identification of a Pure Organic	08
			Compound by chemical test	
Mr. Md Muttakin	Ι	CEMHCC-T-2	Bonding and Physical	02
Sarkar		Organic	Properties	
		Chemistry-1	Valence Bond Theory	
		Theory	Electronic displacements	04
			MO theory	04
			Physical properties	03
			Stereochemistry-I	03
			Relative and absolute	
			configuration	
			Optical activity of chiral	04
			compounds	

Mrs Saleha	II	CHEMHT-3	Acid-Base Concepts and	8
Khatun			Solvents	
			Recapitulation of Arrhenius	
			concept, Bronsted-Lowry	
			concept, Solvent system	
			concept (in H ₂ O, liq. NH ₃ , liq.	
			SO_2 and liq. HF), Lux-Flood	
			concept, Lewis concept	
			Drago-Wayland equation,	7
			Solvent levelling and	
			differentiating effects, Relative	
			strength of different acids and	
			bases, Pauling's rules,	
			Hammett acidity function and	
			super acids, HSAB principle	
			and its applications, Acid-base	
			equilibria in aqueous solution,	
			pH, Buffer, Acid-base	
			neutralization curves and	
			choice of indicators. Gas phase	
			acidity.	
			Quantitative Chemical	10
			Analysis	

Estimation of Fe(III) using $K_2Cr_2O_7$ and KMnO4 solution iii. Estimation of Ca2+ using KMnO4 solution iv. Estimation of Cu2+ iodometrically v. Estimation of Cr3+ using $K_2Cr_2O_7$ solutionMrs. SalehaIICEMHCC-T-3 Inorganic Chemistry- IB TheoryRedox reactions and Qualitative idea about complimentary, noncomplimentary, disprenertionation06
Mrs. SalehaIICEMHCC-T-3 Inorganic Chemistry- IB TheoryRedoxreactions reactions06Mrs. SalehaIICEMHCC-T-3 Inorganic Chemistry- IB TheoryRedoxreactions reactions06
III.Estimation of Ca ²⁺ using KMnO ⁴ solution iv. Estimation of Cu ²⁺ iodometrically v. Estimation of Cr ³⁺ using K ₂ Cr ₂ O ₇ solutionMrs. SalehaIICEMHCC-T-3 Inorganic Chemistry- IB TheoryRedox reactions and Qualitative idea about complimentary, noncomplimentary, dispropertionation06
KMnO' solution IV. Estimation of Cu^{2+} iodometrically v. Estimation of Cr^{3+} using $K_2Cr_2O_7$ solutionMrs. SalehaIICEMHCC-T-3 Inorganic Chemistry- IB TheoryRedox reactions and Qualitative idea about complimentary, noncomplimentary, dispropertionation06
of Cu^{2-3} iodometricallyV.Estimationof Cr^{3+} usingKatunIICEMHCC-T-3RedoxreactionsandInorganicChemistry-Precipitation reactions06Qualitativeideaaboutcomplimentary,IBTheoryOfCu ²⁻³ ideaInorganicChemistry-InorganicandIBTheoryOfCualitativeideaIBInorganicChemistry-IdeaaboutIBInorganicIdeaaboutcomplimentary,IDInorganicIdeaaboutcomplimentary,IBIdeaIdeaaboutcomplimentary,IDIdeaIdeaIdeaaboutIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdeaIdeaIDIdeaIdeaIdea
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IB Theory Qualitative idea about complimentary, noncomplimentary, dispropertionation and
complimentary, noncomplimentary, disproportionation
dispropertionation and
disproportionation
disproportionation and
comproportionation reactions,
standard redox potentials with
sign
conventions, Electrochemical
series and its application to
explore the feasibility
of reactions and equilibrium
constants
Nernst equation; effect of pH, 05
complexation and precipitation
on redox potentials, formal
potential; Basis of
redox titration and redox
indicators, Redox potential
diagrams (Latimer and
Frost) of common elements
and their applications.
Solubility product principle, 04
common ion effect and their
applications to the
precipitation and separation of
common metallic ions as
hydroxides, sulphides,
carbonates, sulphates and
halides.
CEMHCC-P-3 Estimation of Fe(II) using 01
Inorganic Chemistry K ₂ Cr ₂ O ₇ solution
Practical-IB Estimation of Fe(III) using 01
K ₂ Cr ₂ O ₇ Solution
Estimation of Cu ²⁺ 02
iodometrycally

Dr. Condin Kumon
Dr. Sandip Kumar
Кајак
Mr. Delwar
Ansary
7 Histiry
Mr Souraiit
Sarkar
Ma Mal Muttalia
Mr. Ma Muttakin
Sarkar

	Substitution	and	Elimination	03
	Reactions			
	Free-radical		substitution	
	reaction			
	Nucleophilic		substitution	04
	reactions			

Dr. Sandip Kumar	III	CHEMHT-5	Transport processes	10
Rajak		Physical Chemistry –	Viscosity:	
		II	Transport processes	10
			Conductance and transport	
			number:	
			Foundation of Quantum	04
			Mechanics Beginning of	
			Quantum Mechanics:	
			Foundation of Quantum	06
			Wave function: Mechanics	
			Foundation of Quantum	05
			Mechanics	
			Concept of Operators:	
			Foundation of Quantum	05
			Mechanics	
			Particle in a box:	
		CHEMHP-5	Determination of partition	04
		Physical Chemistry –	coefficient for the distribution	
		II	of I ₂ between water andCCl ₄	
			Determination of K _{eq} for KI	04
			+ $I_2 = KI_3$, using partition	
			coefficient between water	
			and CCl ₄ .	
			Conductometric titration of an	04
			acid (strong, weak/ monobasic,	
			dibasic) against strong base.	
Mr. Delwar	III	CHEMHT-5	Application of	03
Ansary		Physical Chemistry –	Thermodynamics-I: Partial	
		II	properties and chemical	
			potential:	
			Application of	03
			Thermodynamics-I: Chemical	
			Equilibrium:	
			Application of	03

			Thermodynamics-I:	
			Application of	04
			Thermodynamics-I: Nernst's	
			distribution law;	
			Chemical potential and other	04
			properties of ideal substances-	-
			pure and mixtures: Pure ideal	
			gas:	
			Application of	03
			Thermodynamics-I	00
			Condensed Phase	
		CHEMHP_5	Study of viscosity of unknown	04
		Dhysical Chamistry	liquid (glycerol, sugar) with	04
		r nysicar Chennisu y –	respect to water.	
		11	Application of	03
			Thermodynamics-I: Partial	
			properties and chemical	
			potential:	
Mrs Saleha	III	CHEMHT-6	Chemical Bonding–II	14
Khatun			Covalent Bond: Lewis	
			structures, formal charge:	
			Qualitative idea of V B	
			Theory directional properties	
			of covalent bond. Concept of	
			Equivalent and non equivalent	
			Hybridization and shapes of	
			simple molecules and ions	
			(avamples from main groups)	
			(examples from main groups), Storoochomically non rigid	
			moloculos Porru's	
			nonecules – Delly S	
			Dinolo momento of increanio	
			Dipole moments of morganic	
			molecules and ions.	1.4
			VSEPR theory and Bent's rule	14
			and their applications; M.O.	
			Theory (elementary pictorial	
			approach), concept of bond	
			order, MO diagram of homo-	
			nuclear diatomics (1 st and 2 nd	
			period elements), hetero-	
			nuclear diatomics (HF, CO,	
			NO, NO ^{$+$} and CN ^{$-$}) and	
			triatomics (H_2O and BeH_2).	
			Electron sea model and	
			elementary idea about band	
			theory, classification of	
			inorganic solids and their	
			conduction properties	

			according to band theory; Hydrogen bonding: classifications, its effect on the properties of compounds and its importance in biological systems, Vander Waal's forces.	
			Metal extraction and purification: Basic Metallurgy Idea about ores and minerals, operations involved in metallurgy, Flow chart diagram for the extraction of pure Ti, Ni and U (including reactions) from their important ores and their uses.	10
		CHEMHP-6	Quantitative inorganic analysis i. Estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution ii. Estimation of Fe(III) and Cu(II) in a given mixture using $K_2Cr_2O_7$ solution iii. Estimation of Cr(VI) and Mn(II) in a given mixture using $K_2Cr_2O_7$ solution iv. Estimation of Fe(III) and Cr(VI) in a given mixture using $K_2Cr_2O_7$ solution v. Estimation of Fe(III) and Mn(II) in a given mixture using $K_2Cr_2O_7$ solution v. Estimation of Fe(II) and Mn(II) in a given mixture using KMnO4 solution vi. Estimation of Fe(III) and Ca(II) in a given mixture using KMnO4 solution	10
Mrs. Saleha Khatun	III	CEMHCC-T-6 Inorganic Chemistry- II Theory	Ionic Bond: Lattice energy, Born-Lande equation with derivation and importance of Kapustinskii expression for lattice energy	05
			Born-Haber cycle and its applications, Polarising power and polarisability of ions, Fajan's rules and its applications	05

			radius ratio rules – its applications and limitations, salvation energy	05
			and solubility energetics of dissolution process;	
			Packing in crystals, voids in crystal lattice, packing efficiency, Structure of ionic solids: rock salt, zinc blende, wurtzite, fluorite, antifluorite,	05
			perovskite and layer lattice. Qualitative idea about stoichiometric and non-	02
			stoichiometric crystal defects.	
		CEMHCC-P-6 Inorganic Chemistry- II Practical	Estimation of Fe(II) and Fe(III) in a given mixture using K ₂ Cr ₂ O ₇ solution	02
			Estimation of Cu(II) and Fe(III) in a given mixture using K ₂ Cr ₂ O ₇ solution	02
			Estimation of Cr(VI) and Fe(III) in a given mixture using K ₂ Cr ₂ O ₇ solution	02
			Estimation of Ca(II) and Fe(III) in a given mixture using K ₂ Cr ₂ O7 solution	02
Mr Sourajit Sarkar	III	CEMHCC-T-7 Organic Chemistry-3 Theory	Carbonyl and Related Compounds Addition to C=O	09
			Exploitation of acidity of α-H of C=O	08
			Elementary ideas of Green Chemistry	03
			Nucleophilic addition to α,β - unsaturated carbonyl system: Nucleophilic addition to α,β - unsaturated carbonyl system:	03
			Substitution at sp2 carbon (C=O system)	03
		CEMHCC-P-7 Organic Chemistry-3 Practical	Qualitative Organic Analysis of single solid organic compound	16
Mr. Md Muttakin Sarkar	III	CEMHCC-T-7 Organic Chemistry-3 Theory	Chemistry of alkenes and alkynes Addition to C=C	06
			Addition to $C=C$ (in comparison to $C=C$)	04

			CEMHCC-	P-7	Aromatic Substitution	04
			Organic Ch	emistry-3	Electrophilic aromatic	
			Practical		substitution	
					Organo-metallics	04
					Free-radical substitution	
					Reaction	
Mr	Sourajit	III	SEC-1B		Introduction	04
Sarkar			Basic	Analytical		
			Chemistry		Complexometry	02
					Soil Analysis	02
					Analysis of water	03
					Analysis of food products	03
					Chromatography	03
					Ion-exchange	02
					Analysis of cosmetics	03
					Suggested Applications (Any one)	02
					Suggested Instrumental demonstrations	03

Dr. Sandip Kumar	IV	CHEMHT	-8	Application of	08
Rajak		Physical	Chemistry-	Thermodynamics – II:	
		III		Colligative properties:	
				Application of	06
				Thermodynamics – II: Phase	
				rule:	
				Application of	06
				Thermodynamics – II: Binary	
				solutions:	
				Quantum Chemistry	06
				Angular momentum:	
				Quantum Chemistry	08
				Qualitative treatment of	
				hydrogen atom and hydrogen-	
				like ions	
				Quantum Chemistry	06
				LCAO and HF-SCF:	
		CHEMH	P-8	Determination of solubility of	02
		Physical (Chemistry –	sparingly soluble salt in water,	
		II		ions and in neutral electrolyte	

			(using common indicator).	
			pH-metric titration of acid (mono-and di-basic) against strong base.	02
			Determination of K _{sp} for AgCl by potentiometric titration of AgNO ₃ solution against standard KCl solution.	02
Mr. Delwar Ansary	IV	CHEMHT-8 Physical Chemistry-	Electrical Properties of molecules: Ionic equilibria	08
		III CHEMHP-8 Physical Chemistry –	Electrical Properties of molecules: Electromotive Force:	06
		Π	Electrical Properties of molecules: Dipole moment and polarizability	06
			Potentiometric titration of Mohr's salt solution against standard K ₂ Cr ₂ O-solution.	02
		CHEMHT-8 Physical Chemistry– III	Effect of ionic strength on the rate of Persulphate –Iodide reaction.	02
			Study of phenol-water phase diagram.	02
			Electrical Properties of molecules: Ionic equilibria	08
Mrs Saleha Khatun	IV	CHEMHT-9	Radioactivity and Nuclear Chemistry Atomic nucleus – nuclear stability, n/p ratio and different modes of decay, mass defect, packing fraction and nuclear binding energy. Nuclear forces: Meson exchange theory, elementary idea of nuclear shell model and magic numbers. Fission, fusion and spallation reactions, artificial radioactivity, super heavy elements and their IUPAC nomenclature. Moderators, slow and fast neutrons, Applications of radio-isotopes in: determination of structures, establishment of reaction	8

			mechanisms and radio-carbon	
			dating, hazards of radiation and	
			safety measures	
			Chemistry of s and p-block	7
			elements	,
			Diagonal relationship (Li May	
			Diagonal relationship (LI-Wg,	
			B-SI) and anomalous behavior	
			of first member of each group,	
			Allotropy and catenation	
			(examples of C, P and S	
			compounds). Study of the	
			following compounds with	
			emphasis on preparation,	
			properties, structure and	
			bonding: Berylium hydrides	
			and halides; diborane;	
			borazine; boron nitride, boric	
			acid, borax, fluorocarbons	
			(with environmental effect);	
			oxides and oxyacids of	
			nitrogen, phosphorous, sulphur	
			and chlorine: Peroxo acids of	
			sulphur: tetrasulphur	
			trtranitride: interhalogens	
			nseudobalogens polybalides	
			fluorides and oxides of xenon	
			Noble gas elethrates: basic	
			Noble gas claumates, basic	
			structurel concete	
			structural aspects and	
			applications of silicones and	
			phosphazines; Structural	
			properties of various silicates.	
		CHEMHP-9	Complexometric Titration	10
			Inorganic Preparation	
Mrs. Saleha	IV	CEMHCC-T-9	Coordination Chemistry-I	03
Khatun			Idea about double salts and	
			complex salts, Werner's theory	
			EAN rule, classification of	03
			ligands and their binding	
			modes	
			IUPAC nomenclature of	03
			coordination compounds (up to	00
			two metal centres)	
			overall and stanwise stability	03
			constants shalatas inner	05
			motallia complexes	
			metanic complexes	02
			Stereochemistry and	03

			isomerism (constitutional and	
			stereo) of complexes with	
			coordination no. 4 and 6.	
		CEMHCC-P-9	Complexometric Titration:	04
		CEIVINCE-1-)	i)Estimation of Hardness of	04
			Weter	
			water $iii)$ Estimation of $C_0(\mathbf{H})$ and	
			11)Estimation of Ca(II) and	
			Mg(II) in a mixture	
			Inorganic Preparation:	02
			i)Mohr's Salt	
			ii)Tetraamminecarbonatocobalt	
			(III) trihydrate	
Mr Sourajit	IV	CEMHCC-T-10	Nitrogen Compounds	03
Sarkar		Organic Chemistry-4	Amines: Aliphatic &	
		Theory	Aromatic:	
			Nitro compounds (aliphatic	02
			and aromatic):	02
			and aromatic).	
			Alkylnitrile and isonitrile	02
			-	
			Diazonium salts and their	02
			related compounds	
			The Logic of Organic	08
			Synthesis	
			Retrosynthetic analysis:	
			Strategy of ring synthesis:	04
				0.6
			Asymmetric synthesis:	06
		CEMHCC-P-10	Organic Quantative Estimation	14
		Organic Chemistry-4		
		Practical		
Mr. Md Muttakin	IV	CEMHCC-T-10	Rearrangements: Mechanism	03
Sarkar		Organic Chemistry-4	with evidence and	
			stereochemical Features for	
			the following	
			Rearrangement to electron-	
			deficient corbon	
				01
			definition with the set	01
			Dencient mitrogen	02
		CEMHCC-P-10	Rearrangement to electron-	02
		Organic Chemistry-4	deficient oxygen	
		Practical	Aromatic rearrangements	01
			Migration from nitrogen to	01
			ring carbon	-
			Rearrangement reactions by	01
			green annroach	01
		1	Sieen approach	

			Organic Spectroscopy UV Spectroscopy IR Spectroscopy NMR Spectroscopy	02 02 05
Mr Sourajit Sarkar	IV	SEC-1B CHEMHS – 2A Pharmaceutical Chemistry	Drugs & Pharmaceuticals Introduction Fermentation Hands On Practical	08 06 06

Mrs Saleha	V	CHEMHT-11	Magnetochemistry	12
Khatun			Classification of magnetic	
			substances, Origin of para	
			magnetic moments,	
			temperature dependence of	
			para magnetism - Curie and	
			Curie-Weiss law, TIP,	
			magnetic susceptibility and its	
			measurement (Gouy method),	
			diamagnetic correction,	
			effective magnetic moment,	
			spin only moment for 3d	
			metals, Orbital contribution to	
			magnetic moment, spin-orbit	
			coupling, quenching of orbital	
			contribution, Sub-normal	
			magnetic moments and	
			antiferromagnetic interactions	
			(elementary idea with	
			examples).	
			Chemistry of d- and f-block	12
			elements	
			d-block elements:	
			Characteristic properties,	
			Comparison among the	
			elements of 3d series with	
			reference to electronic	
			configuration, oxidation states	
			and E^0 values; General	
			comparison between 3d, 4d	
			and 5d series elements in term	

Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry 0 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry I Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry Structure and bonding of odol therein and bonding of odol therein and bonding of coordination set Certifically 04 Cordination Elementary idea about CFT, of de and bout CFT, 06				of electronic configuration,	
Mrs. Saleha V CEMHCC-T-11 Khatun CEMHCC-T-11 Inorganic chemistry -I CEMHCC-T-11 structure and bonding of confurations. 04 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry -II Structure and bonding of conditions. 04 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry -II Structure and bonding of conditions. 04 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry -II Structure and bonding of conditions. 04 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry -II Structure and bonding of conditions. 04 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry -II Structure and bonding of conditions. 04 Coordination Gf de officians. Structure and bonding of conditions. 04				oxidation states, atomization	
Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry 10 Coordination of Mracaca3 and determination of Bracaca Ara				energy, magnetic properties	
Mrs. Saleha V CEMHCC-T-11 Structure and of the transmission between of the transmission between of the transmission between of the transmission between the transmission of the				and coordination chemistry. f-	
Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry- III Theory Experiment: i. Paper chromatographic soft of Migurations. 10 Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry- III Theory Experiment: i. Paper about Circuit of Miguration of Miguration of Miguration of Miguration of Miguration contraction compounds on the sing of Miguration of Miguration				block elements: Comparison	
Mrs. Saleha V CEMHCC-T-11 Experiment: i. Paper chromatographic separation of misparation of sis hmax colorimetrically Mrs. Saleha V CEMHCC-T-11 Experiment: i. Paper chromatographic separation of is hmax colorimetrically Mrs. Saleha V CEMHCC-T-11 Structure and bonding of corrigoration of its hmax colorimetrically 04 Mrs. Saleha V CEMHCC-T-11 Experiment: i. Paper adout of its hmax colorimetrically Mrs. Saleha V CEMHCC-T-11 Experiment: i. Paper adout of its hmax colorimetrically Mrs. Saleha V CEMHCC-T-11 Experiment: i. Paper adout of its hmax colorimetrically Mrs. Saleha V CEMHCC-T-11 Freparation of of its hmax colorimetrically 04 Khatun V CEMHCC-T-11 Freparation of its hmax colorimetrically 04				between d and f-block	
Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Experiment: i. Paper chromatographic sets of V. B. Theory and solvent extraction methods; comparison between lanthanides by ion exchange and solvent extraction methods; comparison between lanthanides by ion exchange and solvent extraction methods; comparison between lanthanides by ion exchange and solvent extraction methods; comparison between lanthanides and actinoids. CHEMHP-11 Quantitative: i. Estimation of available chlorine in bleaching powder using iodometry ii. Estimation of available oxygen in prolusite using permanganometry ii. Estimation of Cu in brass using iodometry iv. Estimation of Ni(II) using DMG gravimetrically B. Experiment: i. Paper chromatographic separation of Mu(2aca)3 and determination of its \max colorimetrically Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry- III Theory structure and bonding of coordination Chemistry-II of available oxing of separation of Mu(2aca)3 and determination of its \max colorimetrically				elements: Electronic	
Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Experiment: i. Paper chromatographic set of Normal Structure Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Structure and bonding of coordination 04 contraction, separation of lanthanides by ion exchange and solvent extraction methods; comparison between lanthanoids and actinoids. CHEMHP-11 Quantitative estimation A. Quantitative: i. Estimation of available chlorine in bleaching powder using iodometry ii. Estimation of available oxygen in pyrolusite using permanganometry iii. Estimation of Cu in brass using iodometry iv. Estimation of Ni(II) using DMG gravimetrically B. Experiment: i. Paper chromatographic separation of Ni(II) and Co(II) ii. Measurement of 10Dq by spectrophotometric method iii. Preparation of Mn(aacc)3 and determination of its \u03c4 max colorimetrically Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry- III Theory structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations. 04				configuration, oxidation states.	
Mrs. Saleha V CEMHCC-T-11 Khatun Cemistry-II Structure and bonding of Confusitions Mrs. Saleha V CEMHCC-T-11 Khatun Structure and bonding of Confurations on the basis of V. B. Theory and its limitations. Coordination Chemistry-II splace about CFT, 06				variation of magnetic	
Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II CEMHCC-T-11 Inorganic chemistry-II Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Statuation Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Statuations Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Statuations Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Statuations Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Statuations O4 coordination				properties (In^{3+}) atomic and	
Mrs. Saleha V CEMHCC-T-11 Schemistry-II Schemistry-II Mrs. Saleha V CEMHCC-T-11 Structure and bonding of Coordination Coordination Mrs. Saleha V CEMHCC-T-11 Structure and bonding of Coordinations. Coordination Mrs. Saleha V CEMHCC-T-11 Structure and bonding of Coordination. CHEMHC-T-11 Mrs. Saleha V CEMHCC-T-11 Structure and bonding of Coordination. CHEMHC-T-11 Khatun CEMHCC-T-11 Structure and bonding of Coordination. Coordination. CHEMHC-T-11 Khatun CEMHCC-T-11 Structure and bonding of Coordination. CO Coordination. Coordination CEMHCC-T-11 Structure and bonding of Coordination. Coordination. CO				ionic (3+) radii of lanthanoids:	
Mrs. Saleha V CEMHCC-T-11 Experiment: i. Mrs. Saleha V CEMHCC-T-11 Structure and bonding of Ni(II) and Co(II) ii. Mrs. Saleha V CEMHCC-T-11 structure and bonding of Coordination 04 Coordination Chemistry-III Structure and bonding of Coordinations. 04 Coordination Cementary idea and bonding of Coordination. 04 Coordination Cementary idea and bonding of Coordination. 04 Coordination Coordination Structure and bonding of Coordination. Coordination Cementary idea and bonding of Coordination. 04				consequences of lanthanide	
Mrs. Saleha V CEMHCC-T-11 Information Experiment: i. Paper chromatographic separation of fill by spectrophotometric method iii. Proparation of fill by spectrophotometric fill by spectrophotometric method iii. Proparation fill by spectrophotometric fill spectrophotometric fill spectrophotometric				contraction separation of	
Mrs. Saleha V CEMHCC-T-11 Image of a configuration of solution of several comparison between lanthanoids and actinoids. 10 Mrs. Saleha V CEMHCC-T-11 Quantitative estimation of configuration of several comparison of a comparison of several comparison of a comparison of a comparison of a comparison of the several comparison of the several comparison of the several comparison of				lanthanidas by ion avalanda	
Mrs. Saleha V CEMHCC-T-11 Image: Content of the second of the seco				and colvent ovtraction	
Mrs. Saleha V CEMHCC-T-11 Inditational characteristry-II 10 Mrs. Saleha V CEMHCC-T-11 Royanic chemistry-II 10 10 Mrs. Saleha V CEMHCC-T-11 Royanic chemistry-II 10 10 Royanic chemistry-II Royanic chemistry-II Royanic chemistry-II 10 10				and solvent extraction	
Mrs. Saleha V CEMHCC-T-11 Quantitationes and actinoids. 10 Mrs. Saleha V CEMHCC-T-11 A. Quantitative estimation of available chlorine in bleaching powder using iodometry ii. Estimation of available oxygen in pyrolusite using permanganometry iii. Estimation of Cu in brass using iodometry iv. Estimation of Cu in brass using permanganometry v. Estimation of chloride gravimetrically vi. Estimation of chloride gravimetrically vi. Estimation of Ni(II) using DMG gravimetrically B. Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-III Theory and its limitations. Structure and bonding of coordination. Mrs. V CEMHCC-T-11 Structure and bonding of the basis of V. B. Theory and its limitations. 04				methods; comparison between	
Mrs. Saleha V CEMEMCC-T-11 Cuantitative: i. Estimation of available chlorine in bleaching powder using iodometry ii. Estimation of available oxygen in pyrolusite using permanganometry iii. Estimation of Cu in brass using iodometry iv. Estimation of Cu in brass using permanganometry v. Estimation of chloride gravimetrically vi. Estimation of chloride gravimetrically b. Image: Chemistry-II Mrs. Saleha V CEMHCC-T-11 Experiment: i. Preparation of Mn(acac)3 and determination of its λ max colorimetrically Mrs. Saleha V CEMHCC-T-11 Structure and bonding of coordinations. O4 Coordination Coordination Elementary idea about CFT, 06 O6				Tantnanoids and actinoids.	10
Mrs. Saleha V CEMHCC-T-11 Khatun Coordination Generative about CFT, 06 Coordination Coordination Elementary idea about CFT, 06			CHEMHP-11	Quantitative estimation	10
Mrs. Saleha V CEMHCC-T-11 structure and bonding of its \u03c4max Mrs. Saleha V CEMHCC-T-11 structure and bonding of its \u03c4max Mrs. Saleha V CEMHCC-T-11 structure and bonding of its \u03c4max Khatun Coordination Coordination Elementary idea about CFT, O6 Coordination Coordination Structure and bonding of its lementary idea about CFT, O6				A. Quantitative: 1. Estimation	
Mrs. Saleha V CEMHCC-T-11 Structure and bonding of Ni(II) and Co(II) Mrs. Saleha V CEMHCC-T-11 Structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations. Mrs. Saleha V CEMHCC-T-11 Structure and bonding of coordination compounds on the basis of V. B. Theory and its limitation. Mrs. Saleha V CEMHCC-T-11 Structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations. Mrs. Saleha V CEMHCC-T-11 Structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations.				of available chlorine in	
Mrs. Saleha V CEMHCC-T-11 Inorganic chemistry-II Structure and bonding of the basis of V. B. Theory and its limitations. Mrs. Saleha V CEMHCC-T-11 Structure and bonding of the basis of V. B. Theory and its limitations. Experiment Image: Coordination Coordination Elementary idea about CFT, 06 Coordination Chemistry-II Structure and bonding of Configuration in 04				bleaching powder using	
Mrs. Saleha V CEMHCC-T-11 Separation of Mn(acac)3 and determination of its λmax colorimetrically Mrs. Saleha V CEMHCC-T-11 Structure and bonding of the basis of V. B. Theory and its limitations. Coordination Coordination Elementary idea about CFT, O6 06				10dometry 11. Estimation of	
Mrs. Saleha V CEMHCC-T-11 structure and bonding of Mrs. Saleha V CEMHCC-T-11 Mrs. Saleha V CEMHCC-T-11 structure and bonding of the basis of V. B. Theory and its limitations. 04 Coordination Coordination Elementary idea about CFT, O6 06				available oxygen in pyrolusite	
Mrs. SalehaVCEMHCC-T-11 Inorganic chemistry-IISalehaVCEMHCC-T-11 spliting of d ^a configurationof04 configurationMrs. SalehaVCEMHCC-T-11 Inorganic chemistry-IIspliting of d ^a configuration04 cooffiguration04 cooffiguration				using permanganometry iii.	
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Mrs. Saleha V CEMHCC-T-11 structure and bonding of the basis of V. B. Theory and its limitations. Mrs. Saleha V CEMHCC-T-11 structure and bonding of the basis of V. B. Theory and its limitations. Coordination Coordination Elementary idea about CFT, 06 06				iodometry iv. Estimation of Fe	
Mrs. Saleha KhatunVCEMHCC-T-11 Inorganic chemistry- III Theorystructure and bonding of coordination04Coordination Chemistry-IICoordination Splitting of d ⁿ configuration in04				in cement using	
Estimationofchloridegravimetrically vi.EstimationofNi(II)usingDMGgravimetrically B.Experiment:i.i.Paperchromatographicseparation of Ni(II) and Co(II)ii.Measurement of 10Dq byspectrophotometric method iii.Preparation of Mn(acac)3 anddetermination of its λmaxcolorimetricallyMrs. SalehaVKhatunInorganic chemistry-III Theorystructure and bonding ofCoordinationcoordinations.CoordinationElementary idea about CFT,06splitting of d ⁿ configuration in				permanganometry v.	
gravimetrically vi. Estimation of Ni(II) using DMG gravimetrically B.Experiment: i. Paper chromatographic separation of Ni(II) and Co(II) ii. Measurement of 10Dq by spectrophotometric method iii. Preparation of Mn(acac)3 and determination of its λmax colorimetricallyMrs. Saleha KhatunVCEMHCC-T-11 Inorganic chemistry- III Theorystructure and bonding of the basis of V. B. Theory and its limitations.04				Estimation of chloride	
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gravimetrically B.Experiment: i. Paper chromatographic separation of Ni(II) and Co(II) ii. Measurement of 10Dq by spectrophotometric method iii. Preparation of Mn(acac)3 and determination of its λmax colorimetricallyMrs. Saleha KhatunVCEMHCC-T-11 Inorganic chemistry- III Theorystructure and bonding of coordination compounds on the basis of V. B. Theory and its limitations.04				of Ni(II) using DMG	
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Mrs. SalehaVCEMHCC-T-11 Inorganic chemistry- III Theorystructure and bonding of coordination compounds on the basis of V. B. Theory and its limitations.04CoordinationCoordinationElementary idea about CFT, splitting of d ⁿ configuration in06				i. Paper chromatographic	
Mrs. SalehaVCEMHCC-T-11 Inorganic chemistry- III Theorystructure and bonding of coordination compounds on the basis of V. B. Theory and its limitations.04CoordinationCoordinationElementary idea about CFT, splitting of d ⁿ configuration in06				separation of Ni(II) and Co(II)	
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Image: Preparation of Mn(acac)3 and determination of its λmax colorimetrically Mrs. Saleha Khatun V CEMHCC-T-11 Inorganic chemistry-III Theory Structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations. 04 Coordination Coordination Coordination Compounds on the basis of V. B. Theory and its limitations. 06 06				spectrophotometric method iii.	
Mrs. Saleha KhatunVCEMHCC-T-11 Inorganic chemistry- III Theorystructure and bonding of coordination compounds on the basis of V. B. Theory and its limitations.04Coordination Chemistry-IICoordination Splitting of d ⁿ configuration in04				Preparation of Mn(acac)3 and	
Mrs. Saleha Khatun V CEMHCC-T-11 Inorganic chemistry- III Theory structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations. 04 Coordination Elementary idea about CFT, Chemistry-II 06				determination of its λmax	
Mrs. Saleha Khatun V CEMHCC-T-11 Inorganic chemistry- III Theory structure and bonding of coordination compounds on the basis of V. B. Theory and its limitations. 04 Coordination Coordination Elementary idea about CFT, chemistry-II 06				colorimetrically	
KhatunInorganic chemistry- III Theorycoordination compounds on the basis of V. B. Theory and its limitations.orCoordinationElementary idea about CFT, splitting of d ⁿ configuration in06	Mrs. Saleha	V	CEMHCC-T-11	structure and bonding of	04
III Theorythe basis of V. B. Theory and its limitations.CoordinationElementary idea about CFT, splitting of dn configuration in	Khatun	•	Inorganic chemistry-	coordination compounds on	÷.
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CoordinationElementary idea about CFT,06Chemistry-IIsplitting of d ⁿ configuration in			j	and its limitations.	
Chemistry-II splitting of d ⁿ configuration in			Coordination	Elementary idea about CFT.	06
			Chemistry-II	splitting of d ⁿ configuration in	

			ML4 to ML6 and ML8	
			systems, factors affecting,	
			measurement of o.	
			spectrochemical series of	
			ligands	
			CESE in weak and strong	02
			CFSE III weak and subing	02
			Helds, OSSE, High	
			spin and low spin complexes,	1
			spin isomerism,	
			tetragonal distortion, Jahn	06
			Teller	
			theorem and applications,	
			achievements and limitations	
			of CFT, nephalauxetic	
			effect, stabilisation of	
			unusually high and low	
			oxidation states of 3d series	
			elements	
			MOT (elementary idea) σ and	04
			π bonding in octahedral	01
			κ bonding in octaneoral	
			pictorial approach) Colour and	
			pictorial approach). Colour and	
			electronic spectra of	
			complexes: selection rules	
			for electronic transitions, d-d	
			transition, charge transfer	
			transition (qualitative idea)	
			L-S coupling and R-S ground	06
			state term for atomic no. up to	
			30,	
			qualitative ORGEL diagram	
			for 3d1 – 3d9 ions with	
			appropriate symbols for the	
			energy levels	
		CEMHCC-P-11	Estimation of available	01
		Inorganic Chemistry-	chloring in bleaching powder	01
		IV Practical	using iodometry	
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Estimation of available ovygen	02
			Estimation of available oxygen	02
			ni pyroiusite using	
			permanganometry	
			Estimation of Fe in cement	02
			using permanganometry	
			Estimation of Ni(II) using	01
			DMG gravimetrically	
			Estimation of chloride	01
			gravimetrically	
Dr. Sandip Kumar	V	CHEMHT-12	Molecular Spectroscopy	04

Rajak		Physical Chemistry –	Interaction of electromagnetic	
		IV	radiation	
			Molecular Spectroscopy	06
			Rotation spectroscopy:	
			Vibrational spectroscopy:	06
			Molecular Spectroscopy	04
			Raman spectroscopy:	
			Molecular Spectroscopy	04
			Nuclear Magnetic Resonance	
			(NMR) spectroscopy,	
			Electron Spin Resonance	
			(ESR) spectroscopy:	
			Surface phenomenon	06
			Surface tension and energy:	
			Surface phenomenon	06
			Adsorption:	
			Surface phenomenon	06
			Colloids:	
		CHEMHP-12	Verification of Beer and	02
		Physical Chemistry –	Lambert's Law for KMnO ₄ and	
		IV	K ₂ Cr ₂ O ₇ solution	
			Study of kinetics of $K_2S_2O_8+$	02
			spectrophotometrically	
			spectrophotometricany.	
			Determination of CMC from	02
			surface tension	02
			measurements.	
Mr. Delwar	V	CHEMHT-12	Phtochemistry:	06
Ansary		Physical Chemistry –	Lambert-Beer's law	
		IV	Photochemistry:	06
			Photochemical Processes	
			Photochemistry:	06
			Rate of Photochemical	
			processes	
		CHEMHP-12	Determination of surface	02
		Physical Chemistry –	Stalagmometer	
		IV	Determination of pH of	02
			unknown buffer.	02
			spectrophotometrically.	
Mrs Saleha	V	CHEMHTDSE-1B	Silicate Industries	9
Khatun		Inorganic Materials of	Fertilizers	9
		Industrial Importance	Surface Coatings	9
			Batteries	9
			Alloys	9

			Catalysis	9
			Chemical explosives	6
Mr Sourajit	V	CEMH-DSE-T-2C	Twelve principles of Green	06
Sarkar		Green Chemistry	Chemistry	
		Theory	Prevention/ minimization of	05
			hazardous/ toxic products	
			Energy requirements for	05
			reactions – alternative sources	
			of energy	
			Prevention of chemical	06
			accidents designing greener	
			processes	
			Future Trends in Green	04
			Chemistry	
			Oxidation reagents and	
			catalysts	
		CEMH-DSE-P-2C	Green Chemistry Practical	15
		Green Chemistry		
		Practical		
Mr. Md. Muttakin	V	CEMHDSE-T-2C	Green Chemistry	05
Sarkar		Green Chemistry	Introduction to Green	
			Chemistry	
			Examples of Green Synthesis/	10
			Reactions and some real-	
			World cases	
		CEMHDSE-T-2C	Green Chemistry Practical	05
		Green Chemistry	_	
		Theory		

Mrs Saleha	VI	CHEMHT-13	Bio-inorganic Chemistry	25
Khatun			Essential elements of life, Role	
			of metal ions in living systems-	
			a brief review, Elementary idea	
			about proteins, enzymes and	
			ionophores; Structure of ATP,	
			Na ⁺ ion pump and transport of	
			Na ⁺ and K ⁺ across cell	
			membrane; active site	
			structures and bio-functions of	
			haemoglobin, myoglobin,	
			carboxy peptidase A, carbonic	
			anhydrase B, cytochrome c,	

			ferredoxins and chlorophyll;	
			biological nitrogen fixation;	
			toxic metals (Pb, Cd and Hg)	
			and their effects. Wilson	
			disease. chelation therapy:	
			platinum and gold complexes	
			as drugs (examples only)	
			Organometallic chemistry and	25
			catalysis	25
			Definition Classification of	
			Definition, Classification of	
			bartisity of liganda	
			napucity of figands,	
			nomenciature, 16- electron &	
			18-electron rule and its	
			applications; preparation and	
			structure of mono- and bi-	
			nuclear carbonyls of 3d series,	
			synergic effect of CO and use	
			of IR data to explain extent of	
			back bonding; General	
			methods of preparation of	
			metal-carbon σ-bonded	
			complexes, Zeise's salt, Metal-	
			carbon multiple bonding;	
			Preparation, structures,	
			properties and reactions of	
			ferrocene; elementary idea	
			about oxidative addition,	
			reductive elimination, insertion	
			reactions: Study of the	
			following catalytic processes:	
			alkene hydrogenation	
			(Wilkinson's catalyst)	
			hydroformylation Wacker	
			process Synthetic gasoline	
			(Fischer Tropsch reaction) and	
			Olefin polymerization reaction	
			(Ziagler Nette astalyst)	
		CHEMID 12	(Ziegiei-Natta Catalyst)	10
Mag. Cal-1	171		Qualitative semimicro analysis	10
Mrs. Salena	V I	CEMHCC-1-13	Symmetry as a universal	02
Khatun			theme, concept of symmetry	
		Molecular Symmetry	elements and operations	
		and Point group	(with examples);	
			symmetry properties of atomic	02
			orbitals (s, p and d);	
			identification of molecular	04
			point groups in some simple	

		molecules and ions:	
		and ions, applications of symmetry for	02
		polarity and chirality.	02
	Bio-inorganic	Essential elements of life. Role	06
	Chemistry	of metal ions in living systems-	00
	5	a brief review,	
		Elementary idea about proteins,	
		enzymes and ionophores;	
		Structure of ATP, Na+	
		ion pump and transport of Na+	
		and K+ across cell membrane;	
		active site	03
		structures and bio-functions of	
		naemoglobin, myoglobin,	06
		carboxy pepudase A,	06
		cytochrome c ferredoxins and	
		chlorophyll: biological	
		nitrogen fixation;	
		toxic metals (Pb, Cd and Hg)	04
		and their effects, Wilson	
		disease,	
		chelation therapy; platinum and	04
		gold complexes as drugs	
		(examples only)	
	CEMHCC-P-13	Qualitative semimicro analysis	06
	Qualitative semimicro	of mixtures containing four	
	analysis	radicals (excluding oxide and	
		carbonate). Emphasis should be	
		given to the understanding of	
		the chemistry of different	
		reactions and to assign the	
		Basic Radicals: K^+ NH 4^+	
		$Mg^{2+}, Ca^{2+}, Ba^{2+}, Sr^{2+}, Al^{3+}$	
		Cr^{3+} , Mn^{2+} , Fe^{3+} / Fe^{2+} , Co^{2+} ,	
		Ni ^{2+,}	
		Cu ²⁺ , Zn ²⁺ , Pb ^{2+,} Cd ²⁺ , Bi ³⁺ ,	
		Sn^{2+} / Sn^{4+} , As^{3+}/As^{5+} , $Sb^{3+/}$	
		Sb ³⁺	0.7
		Acid Radicals: Cl^{-} , Br^{-} , I^{-} , $S^{2^{-}}$	02
		504^{-7} , 5203^{-7} , SCN, $N03^{-7}$, NO PO-3- PO-3- A-O-3	
		$H_2 RO_2$, BO_3 , FO_4^- , ASO_4^- and $H_2 RO_2$	
		Insoluble Materials: Cr ₂ O ₂ (ig)	03
		1.1.010010 1.100010100.01203(15),	05

			Fe ₂ O ₃ (ig), Al ₂ O ₃ , SnO ₂ , PbSO ₄ BaSO ₄ SrSO ₄	
Mr Souraiit	VI	CEMHCC-T-14	Carbocycles and Heterocycles	06
Sarkar	• 1	Organic Chemistry-4	Polynuclear hydrocarbons and	00
Surrur		Theory	their derivatives	
		1	Heterocyclic compounds	04
			Synthesis (including	04
			retrosynthetic approach and	01
			mechanistic details)	
			Pyridine	06
			Cyclic Stereochemistry	06
			Aliquelia compounds	
		CHEMUCC D 14	Chromotographic Separations	08
		Organic Chemistry-4	Chromatographic Separations	08
		Practical	Spectroscopic Analysis of	06
			Organic Compounds	
Mr. Md Muttakin	VI	CEMHCC-T-14	Pericyclic reactions	03
Sarkar		Organic Chemistry-4	Mechanism, stereochemistry,	
		Theory	regioselectivity in case of	
			Electrocyclic reactions	02
			Cycloaddition reactions	02
			Sigmatropic reactions	02
		CHEMHCC-P-14	Carbohydrates	05
			Monosaccharides,	
			disaccharides, polysaccharides	
			Biomolecules	05
			Amino acids, peptides	
			Chromatographic Separations	05
Dr. Sandip Kumar	VI	CHEMHTDSE-3	Statistical Thermodynamics	06
Rajak		Advanced Physical	Configuration:	
		Chemistry	Statistical Thermodynamics	06
			Boltzmann distribution:	
			Statistical Thermodynamics	06
			Partition function:	07
			Special selected topics	07
			Specific heat of solid:	07
			Special selected topics	07
			Sharial salastad tonics	07
			Polymers	07
		CHEMHTDSE-3	Roots of equations: (e.g.	02
		Advanced Physical	volume of van der Waals gas	02
		Chemistry	and comparison with ideal gas	
		<i></i> ,	pH of a weak acid).	
			Numerical differentiation	02

			(e.g., change in pressure for small change involume of a van der Waals gas, potentiometric titrations).	
			Numerical integration (e.g. entropy/ enthalpy change from heat capacity data), probability distributions (gas kinetic theory) and mean values	02
Mr Delwar	VI	CHEMHTDSE-3	Crystal Structure: Bravais	08
Ansarv	• 1	Advanced Physical	Lattice and Laws of	00
		Chemistry	Crystallography:	
			Crystal Structure:	06
			Crystal planes:	
			Crystal Structure:	06
			Determination of crystal	
			structure	

Name of Teacher	Semester	Paper	Content	No. of
Salaha Khatun	T	CHEMC T 01	A tomio Structuro	
Salella Kilatuli	1	CHEIVIG-1-01	Chamical Dariadiaity	09
			Deday Desetions	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent and	
			solvent, differentiating and	
			levelling solvents.	
			Acids and bases	03
			Lewis acid-base concept,	
			classification of Lewis acids	
			and bases, Lux-Flood concept	
			and solvent system concept.	00
			Acids and bases	02
			Hard and softacids and bases	
			(HSAB concept), applications	
			OI HSAB process.	02
			Introduction	02
			(12L)	
			Alkanes (up to5 Carbons)	03
			Alkenes:(upto5 Carbons).	04
			Alkynes:(upto5 Carbons)	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu(II)ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic	05
			Chemistry	
			Electronic displacements	
			Stereochemistry	05
			Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic	Solid Organic Compound(s)	
		Chemistry -1		

Saleha Khatun	II	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			a) Ionic Bonding	~-
			b) Covalent Bonding	07
			c) MO Approach	07
			Comparative study of p-block	04
			elements:	
			a) Group trends in electronic	
			configuration, modification of	
			b) Common ovidation states	04
			b) Common Oxidation states,	04
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	
			iii. N-P-As-Sb-Bi	02
			iv. O-S-Se-Te	
			v. F-Cl-Br-I	
		CHEMG-P-02	Qualitative semi-micro	03
			analysis of mixtures	
			containing three radicals.	
			Emphasis should be given	
			to the understanding of the	
			chemistry of different	
			reactions. Acid Radicals: Cl ⁻ ,	
			Br ⁻ , I ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , S ²⁻ , SO ₄ ²⁻ ,	
			BO_3^{3-7} , H_3BO_3 .	
			Basic Radicals: Na ⁺ , K ⁺ , Ca ²⁺ ,	02
			Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} ,	
Dolwor Angery	TT	CHEMC T 02	NI, CU, NH4.	10
Derwar Ansary	11	CHEMIG-1-02	Real gases	12
			Liquids	05
		CHEMG_P_02	Surface tension measurement	02
			(use of organic solvents	02
			excluded)	
			Viscosity measurement (use of	02
			organic solvents excluded)	
MdMuttakin	II	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Saleha khatun			Ionic Equilibria	09
	TTT	CHEMG-T-03	Aryl Halides	04
	111	CHEMG-P-03	Determination of enthalpy of hydration of copper sulphate	02
	III	CHEMG-T-03	Chemical Energetics	12
Delwar Ansary			Carbonyl Compounds	07
		CHEMG-P-03	Determination of heat capacity of calorimeter for different volumes	02
			Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	02
Saleha Khatun	III	CHEMG-T-03	Chemical Equilibrium	09
			Alcohols, Phenols and Ethers	08
		CHEMG-P-03	Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH meter and compare it with the indicator method Preparation of buffer solutions	02
			and find the pH of an unknown buffer solution by colour matching method (using following buffers) a. Sodium acetate-acetic acid b. Ammonium chloride- ammonium hydroxide	
Md Muttakin	III	CHEMG-T-03	Aromatic hydrocarbons	06
Sarkar			Organometallic compounds	04
		CHEMGP-3 Organic Chemistry -1	Identification of a pure organic compound	04

Saleha Khatun		CHEMG-T-04	Coordination Chemistry	10
	IV		Crystal Field Theory	10
		CHEMG-P-04	Complexometric estimation	02
			of (i) Mg2+ or (ii) Zn2+	
			using EDTA.	
			Preparation of any two of the	01
			following complexes:	
			a.tetraammine	

			carbonatocobalt (III) nitrate	
Delwar Ansary	IV	CHEMG-T-04	Phase Equilibrium	07
		CHEMG-P-04	Study of the equilibrium of	02
			one of the following	
			reactions by the distribution method: $I_2(aq) + I_2(aq) = I_2$	
			12(aq) + 1(aq) - 1	
			Perform the following	02
			potentiometric titrations:	-
			Weak acid vs. strong base	
			Potassium dichromate. Mohr's salt	02
Saleha Khatun	IV	CHEMG-T-04	Conductance	08
			Transition Elements (3d	10
			Series)	
		CHEMG-P-04	Preparation of any two of the	01
			following complexes:	
			b. tetraamminecopper(II)	
			sulphate	01
			c. potassium trioxalatochromate(III)	01
			trihydrate	
			d. potassium	01
			bisoxalatocuprate(II)	
			trihydrate	
Md Muttakin	IV	CHEMG-T-04	Solutions	05
Sarkar			Electromotive force	05
		CHEMG-P-4	conductometric titrations:	02
Salaha Khatun	V		Chemical Analysis	14
Salella Kliatuli	v		To find the total hardness of	02
			water by EDTA titration	02
			Determination of the strength	02
			of the H2O2 sample	
Delwar Ansary	V	CHEMGTDSE-1	Error Analysis and	12
			Computer Applications	
		CHEMGPDSE-1	To determine the rate	02
			constant for the acid	
			catalysed hydrolysis of an	
			TitrationofHClandCH2CO	02
			OHmixturevsNaOHusinot	02
			wodifferentindicatorstofin	
			dtheconcentration.	
Saleha Khatun	V	CHEMGTDSE-1	Industrial Chemistry	18
		CHEMGPDSE-1	Titration of Na2CO3 and	02
			NaHCO3 mixture vs HCl	
			using phenolphthalein and	

			methyl orange	
			indicators	
Md Muttakin	V	CHEMGTDSE-1	Environmental Chemistry	16
Sarkar		CHEMGPDSE-1	Estimation of available	02
			oxygen in pyrolusite	
Saleha Khatun	VI	CHEMGTDSE-2	Polymers	04
			Paints	03
			Varnishes	02
			Fats and Oils	03
		CHEMGPDSE-2	Purification of the crude	02
			product is to be made by	
			crystallisation from	
			water/alcohol	
			Estimation of	02
			saponification value of oil /	
			ester / fat.	
Delwar Ansary	VI	CHEMGTDSE-2	Amines and Diazonium	10
			Salts	
			Amino Acids and	10
			Carbohydrates	
		CHEMGPDSE-2	Hydrolysis of	02
			amides/imides	
			Acetylation of aromatic	02
			amines	
Saleha Khatun	VI	CHEMGTDSE-2	Synthetic dyes	02
			Drugs and	03
			Phermaceuticals	
			Pesticides	03
			Fermentation Chemicals	03
		CHEMGPDSE-2	Estimation of acetic acid in	01
			commercial vinegar	
			Estimation of amino acid	02
			by formol titration	
Md Muttakin	VI	CHEMGTDSE-2	Carboxylic Acids and Their	06
Sarkar			Derivatives	
			Industrial Chemistry	02
			Food additives	
		CHEMGPDSE-2	Nitration of aromatic	02
			compounds	
			Purification of the crude	01
			product is to be made by	
			crystallization from	
			water/alcohol.	

Name of Teacher	Semester	Paper	Content	No. of
				Lecture
Saleha Khatun	I	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09
			Redox Reactions	04
		CHEMG-P-01	Estimation of Fe(II) ions with K ₂ Cr ₂ O ₇	01
			Estimation of carbonate and bicarbonate present together in a mixture	02
Delwar Ansary	T	CHEMG-T-01	A cids and bases	03
	1		Brönsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents.	
			Acids and bases Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.	03
			Acids and bases Hard and soft acids and bases (HSAB concept), applications of HSAB process.	02
			Aliphatic Hydrocarbons Introduction	02
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
		CHEMG-P-01	Estimation of oxalic acid by titrating it with KMnO ₄ .	02
			Estimation of Cu (II) ions iodometrically using Na ₂ S ₂ O ₃ .	02
Md Muttakin Sarkar	Ι	CHEMG-T-01	Fundamentals of Organic Chemistry 1.Electronic displacements	05
			2.Stereochemistry	05

		3. Nucleophilic Substitution and Elimination Reactions	04	
	CHEMGP-1	Qualitative Analysis of Single	05	
	Organic	Solid Organic Compound(s)		
	Chemistry -1			

Saleha Khatun	II	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			a) Ionic Bonding	
			b) Covalent Bonding	07
			c) MO Approach	07
			Comparative study of p-block	04
			elements :	
			a)Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	
			iii. N-P-As-Sb-Bi	02
			iv. O-S-Se-Te	
			v. F-Cl-Br-I	
		CHEMG-P-02	Qualitative semi-micro	03
			analysis of mixtures	
			containing three radicals.	
			Emphasis should be given	
			to the understanding of the	
			chemistry of different	
			reactions.	
			Acid Radicals: Cl^- , Br^- , I^- , NO_2^-	
			$, NO_3^{-}, S^{2-}, SO_4^{2-}, BO_3^{3-},$	
			H ₃ BO ₃ .	
			Basic Radicals: Na^+ , K^+ , Ca^{2+} ,	02
			Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} ,	
			$N1^{2+}, Cu^{2+}, NH4^+.$	10
Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	~ ~
			Liquids	05

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		CHEMG-P-02	Surface tension measurement (use of organic solvents excluded)	02
			Viscosity measurement (use of organic solvents excluded)	02
Md Muttakin	II	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

Delwar Ansary	Ι	CHEMG-T-01	Acids and bases	03
			Brönsted–Lowry concept,	
			conjugate acids and bases,	
			relative strengths of acids and	
			bases, effects of substituent and	
			solvent, differentiating and	
			levelling solvents.	
			Acids and bases	03
			Lewis acid-base concept,	
			classification of Lewis acids	
			and bases, Lux-Flood concept	
			and solvent system concept.	
			Acids and bases	02
			Hard and soft acids and bases	
			(HSAB concept),	
			applications of HSAB	
			process.	
			1	
			Aliphatic Hydrocarbons	02
			Introduction	
			Alkanes (up to 5 Carbons)	03
			Alkenes: (up to 5 Carbons).	04
			Alkynes: (up to 5 Carbons).	03
			Estimation of evalua said by	00
		CHEMG-P-01	titrating it with KMnQ	02
			turaung it with KivinO4.	
			Estimation of Cu (II) ions	02
			iodometrically using $Na_2S_2O_3$.	
Saleha Khatun	III	CHEMG-T-01	Atomic Structure	09
			Chemical Periodicity	09

			Redox Reactions	04
			Estimation of Fe(II) ions with	01
		CHEMG-P-01	$K_2Cr_2O_7$	
			Estimation of carbonate and	02
			bicarbonate present together in	
			a mixture	
Md Muttakin	III	CHEMG-T-01	Fundamentals of Organic	05
Sarkar			Chemistry	
			1.Electronic displacements	
			2.Stereochemistry	05
			3. Nucleophilic Substitution	04
			and Elimination Reactions	
		CHEMGP-1	Qualitative Analysis of Single	05
		Organic Chemistry -1	Solid Organic Compound(s)	

Delwar Ansary	II	CHEMG-T-02	Kinetic Theory of Gases and	12
			Real gases	05
			Liquids	05
			(use of organic solvents excluded)	02
		CHEMG-P-02	Viscosity measurement (use of	02
			organic solvents excluded)	•
Saleha Khatun	IV	CHEMG-T-02	Chemical Bonding and	06
			Molecular structure:	
			d) Ionic Bonding	
			Covalent Bonding	07
			MO Approach	07
			Comparative study of p-block	04
			elements :	
			a)Group trends in electronic	
			configuration, modification of	
			pure elements,	
			b) Common oxidation	04
			states, inert pair effect, and their	
			important compounds in	
			respect of the following groups	
			of elements	
			i. B-Al-Ga-In-Tl	
			ii. C-Si-Ge-Sn-Pb	

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			iii. N-P-As-Sb-Bi iv. O-S-Se-Te v. F-Cl-Br-I	02
		CHEMG-P-02	Qualitativesemi-microanalysis of mixtures containingthreeradicals.Emphasisshould be giventotothe understanding of thechemistryofdifferentreactions.Acid Radicals:Cl ⁻ , Br ⁻ , I ⁻ , NO2 ⁻ , NO3 ⁻ , S2 ⁻ , SO42 ⁻ , BO33 ^{-,} H3BO3.	03
			Basic Radicals: Na^+ , K^+ , Ca^{2+} , Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+} , Fe^{3+} , Ni^{2+} , Cu^{2+} , NH_4^+ .	02
Md Muttakin	IV	CHEMG-T-02	Solids	05
Sarkar			Chemical kinetics	05
		CHEMG-P-02	Viscosity measurement (use of	02
		Physical Chemistry – I	organic solvents excluded)	

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NAME OF TEACHER	YEAR	PAPER	CONTENT	NO OF PERIOD
Ms Saleha	1 st	T	Nuclear chemistry and radioactivity	10
Khotun	(Hons)	Inorgania	Chemistry of elements	18
Kilatuli	I	morganic	1 Diagonal Relationshin	10
	1		2 Extraction and Purification and use	
			of Ti V Cr Ni and U 3	
			Preparation, properties bonding.	
			stereochemistry of some	
			compounds	
			Acid-bases and solvents	12
Mr. Masadul	1 st	Ι	The nature of Chemical bond-I	12
Shaikh	(Hons)	Inorganic	Ionic bonding	
			Periodic table	10
			Chemistry of elements	05
			Comparative study of group 13 and 14.	
Mr. Arif	1 st	Ι	Atomic structure (extra nuclear)	12
Mohammad	(Hons)	Inorganic	The nature of Chemical bond-I	11
			Some mixed oxide structure, Bonding in	
			metals	
Mr Sourajit	1 st	II (Gr. A)	Bonding features in organic molecules	07
Sarkar	(Hons)	Organic	Organic acids and bases	03
			Tauto merism	02
			Reaction mechanism-I	07
			Stereochemistry-I	11
			Reaction mechanism-II	11
			Synthesis, physical properities and	
			reactions of classes of compounds:	04
			Alkanes, alkens, alkadiens and arencs, alkyl	
			halids, vinyl halides, allyl and benzyl halids	
Dr. Sandip	1st	II (Gr. B)	Chemical thermodynamics:	16
Kumar Rajak	(Hons)	Physical	1. General introduction of	
			thermodynamics and zeroth law of	
			thermodynamics	
			2. Thermodynamics-I	
			3. Thermo chemistry	
			4. Thermodynamics-II	
			Chemical Equilibriam	04
			Colligative properities of solution	05
Mr Dilwar	1st	II (Gr. B)	Kinetic theory and gaseous state	12
Ansari	(Hons)	Physical	1. Ideal gas	
			2. Real Gas	

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Image: Problem in the second problem in the proble				Liquid State:	08
Dr. Sandip Kumar Rajak 1st (Hons) III Practical Qualitative analysis of single organic compound and organic preparation 10 Ms Saleha Khatun 1st (Hons) III Practical Qualitative analysis of single organic compound and organic preparation 10 Mr Souraji Sarkar 1st (Hons) III Practical Qualitative analysis of single organic compound and organic preparation 10 Ms Saleha Khatun 2 nd (Hons) IV Inorganic Transition element and coordination compounds 20 Ms Saleha Khatun 2 nd (Hons) IV Inorganic Transition element and coordination compounds 20 Mr. Masadul Shaikh 2 nd (Hons) IV Inorganic Transition element and coordination compounds 20 Mr. Masadul Shaikh 2 nd (Hons) IV Inorganic Transition element and coordination compounds 10 Md. Muttakin Sarkar 2 nd (Hons) IV Inorganic Nature of chemical bond-III 15 Mr. Masadul Shaikh 2 nd (Hons) V (Gr. A) Organic Stereochemistry-II 10 Ms Muttakin Sarkar 2 nd (Hons) V (Gr. B) Physical Chemical Kinetics 10 Dr. Sandip Kumar Rajak 2 nd (Hons) V (Gr. B) Physical Chemical Kinetics				1. Vapour pressure	
Dr. Sandip Kumar Rajak1st (Hons)III PracticalQualitative analysis of single organic compound and organic preparation10Ms Saleha Khatun1st (Hons)III PracticalQualitative analysis of single organic compound and organic preparation10Mr Sourajit1st (Hons)III PracticalQualitative analysis of single organic compound and organic preparation10Mr Saleha Khatun2nd (Hons)IV InorganicTransition element and coordination compounds20Ms Saleha Khatun2nd (Hons)IV InorganicTransition element and coordination compounds20Mr. Masadul Sarkar2nd (Hons)IV InorganicTransition element and coordination compounds20Mr. Masadul Sarkar2nd (Hons)IV InorganicNature of chemical bond-III15Md. Muttakin Sarkar2nd (Hons)V (Gr. A) OrganicNature of chemical carbonyls05Md. Muttakin Sarkar2nd (Hons)V (Gr. A) OrganicStereochemistry-II10Dr. Sandip Kumar Rajak2nd (Hons)V (Gr. B) PhysicalChemical Kinetics10Mr Dilwar Khatun2nd (Hons)V (Gr. B) PhysicalChemical Kinetics10Mr Dilwar Khatun2nd (Hons)V (Gr. B) PhysicalChemical Kinetics05Mr Dilwar Khatun2nd (Hons)V (Gr. B) PhysicalChemical Kinetics10Mr. Masadul Khatun2nd (Hons)V (Gr. B) (Practical)C				2. Surface tension	
Dr. Sandip Kumar Rajak 1st (Hons) III Practical Qualitative analysis of single organic compound and organic preparation 10 Ms Saleha Khatun 1st (Hons) III Practical Qualitative analysis of single organic compound and organic preparation 10 Ms Saleha Khatun 1st (Hons) III Practical Qualitative analysis of single organic compound and organic preparation 07 Ms Saleha Khatun 2st (Hons) IV (Hons) Transition element and coordination compounds 20 Mr. Masadul Shaikh 2st (Hons) IV Inorganic Transition element and coordination compounds 20 Mr. Masadul Shaikh 2st (Hons) IV Inorganic Transition element and coordination compounds 20 Mr. Muttakin Sarkar 2st (Hons) IV Inorganic Nature of chemical bond-III 15 Md. Muttakin Sarkar 2st (Hons) V (Gr. A) Organic Stereochemistry-II 10 Synthesis, physical properities and reactions of classes of compounds 20 20 Dr. Sandip Kumar Rajak 2st (Hons) V (Gr. B) Physical Chemical Kinetics 10 Mr Dilwar Khatun 2st (Hons) V (Gr. B) Physical Chemical Kinetics 05 Mr Dilwar Khataui </td <td></td> <td></td> <td></td> <td>3. viscosity</td> <td></td>				3. viscosity	
Kumar Rajak Ms Saleha KhatunIst (Hons)Practicalcompound and organic preparationMs Saleha Khatun1st (Hons)III PracticalQualitative analysis of single organic compound and organic preparation10Mr Sourajit14 (Hons)III PracticalQualitative analysis of single organic compound and organic preparation07Ms Saleha Khatun2 st (Hons)IV InorganicTransition element and coordination compounds20Mr. Masadul Shaikh2 st (Hons)IV InorganicTransition element and coordination compounds20Mr. Masadul Shaikh2 st (Hons)IV InorganicNature of chemical bond-III15Mr. Masadul Sarkar2 st (Hons)IV (Gr. A) OrganicNature of chemical bond-III15Md. Muttakin Sarkar2 st (Hons)V (Gr. A) OrganicStereochemistry-II10Md. Muttakin Sarkar2 st (Hons)V (Gr. A) PhysicalStereochemistry-II10Dr. Sandip Kumar Rajak2 st (Hons)V (Gr. B) PhysicalChemical Kinetics10Mr Dilwar Ansari2 ^{std} (Hons)V (Gr. B) PhysicalChemical Kinetics10Mr Dilwar Ansari2 ^{std} (Hons)V (Gr. B) PhysicalElectrochemistry Inorganic quantitative analysis and Inorganic granic granic granic granic compounds05Mr Dilwar2 ^{std} (Hons)V I InorganicInorganic granic granic granic Inorganic granic Inorganic granic Inorganic00 <td>Dr. Sandip</td> <td>1st</td> <td>III</td> <td>Qualitative analysis of single organic</td> <td>10</td>	Dr. Sandip	1st	III	Qualitative analysis of single organic	10
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Shaikh	(Hons)	(practical)	Inorganic preparation	
Md. Muttakin	2 nd	VI	Inorganic quantitative analysis and	10
Sarkar	(Hons)	(practical)	Inorganic preparation	
Ms Saleha	3 rd	VII	Symmetry of the elements, symmetry	12
Khatun	(Hons)	Inorganic	operations and point group	
			The nature of Chemical bond III	26
			Chemistry of Elements	12
			1. Oxides, halides, oxo halides of Mo,	
			W etc.	
			2. Separation of Nb and Ta	
Mr. Masadul	3 rd	VII	Chemistry of Organo metallic compounds	16
Shaikh	(Hons)	Inorganic	Chemistry of Elements	06
			1. Platinum metals	
Mr. Arif			Bioinorganic Chemistry	16
Mohammad			Magneto chemistry	12
Mr Sourajit			Stereochemistry-III	10
Sarkar			.	
			Reaction mechanism-IV	15
			Spectroscopy in Organic chemistry	25
			Organic Synthesis-I	12
			Organic Synthesis-II	12
			Heterocyclic compounds	10
			Synthetic dyes, pharmaceuticals and	06
			polymers	10
Du Caulin	Ord	IV	Molecules of nature	10
Dr. Sandip Kumar Dajak	J ^u (Hone)	1A Dhysiaal	Quantum theory, atomic spectra and molecular structure	20
Kuillai Kajak	(110115)	Thysical	Atomic structure and atomic spectra	8
			Chemical bonding and molecular geometry	10
			Phase equilibria	10
			i nuse equinoriu	12
			Statistical thermodynamics	05
Mr Dilwar	3 rd	IX	Eletrical and magnetic properties of matter	10
Ansari	(Hons)	Physical	Rotational spectra	06
		-	Vibrational spectra	12
			Photo chemistry	17
Ms Saleha	3 rd	X Gr. A	Inorganic qualitative analysis	24
Khatun	(Hons)	(practical)		
Mr. Masadul	3 rd	X Gr. B	Organic quantitative	10
Shaikh	(Hons)	(practical)		
Dr. Sandip	3 rd	XI Gr. B+C	1.Physical Chemistry practical	18
Kumar Rajak	(Hons)	Physical	2. Computer application	10
Mr Dilwar		XI Gr. A	Physical Chemistry practical	12
Ansarı	(Hons)	Physical		

DISTRIBUTION OF SYLLABUS DEPARTMENT OF CHEMISTRY DUMKAL COLLEGE SESSION: 2018-2019 GENERAL COURSE

NAME OF	YEAR	PAPER	CONTENT	NO OF
TEACHER				PERIOD
Arif	1 st	Ι	Atomic structure	10
Mohammad	(GEN)	Inorganic	Periodic Properties	05
		Gr. (A)	The nature of chemical bond	20
			Principles of chemical Analyses	15
Dr. Swadesh	1 st	Ι	Aliphatic Hydrocarbons& Their	07
Mandal	(GEN)	Organic	Derivatives	
		Gr.(B)	Alcohols and Ethers	03
			Aldehydes and Ketones	05
			Organic compounds containing nitrogen	06
			Carbohydrates	04
			· · · ·	
Dr. Sandip	1st	I (Gr. C)	Kinetic theory and gaseous state	4
Kumar Rajak	(GEN)	Physical	Real Gas	4
5	. ,		First and second laws of	7
			thermodynamics	
			Principles of thermo chemistry	4
			Dilute solution	6
Arif	1 st	III Gr-B	Oualitative analysis	15
Mohammad	(GEN)	(Organic	Quantitative analysis	
	()	practical)	<i>2</i>	
Dr. Swadesh	2 nd	I	Coordination compounds	14
Mandal	(GEN)	Inorganic	r i i i i i i i i i i i i i i i i i i i	
		(Gr-Å)	Chemistry of elements	28
			Radiochemistry	8
ADIE	and	$\mathbf{H}(\mathbf{Cr},\mathbf{P})$	Stares chemistry of argenic compounds	0
MOHAMMAD	(GEN)	Organic	Stereo chemistry of organic compounds	9
			Mechanism of organic reactions	8
			Benzene and its derivatives	4
			Phenols	4
Ujjwal Mondal	2 nd	V (Gr. C)	Viscosity	3
55	(GEN)	Physical		
			Surface tension	2
			Electrolytic conductance	6
			EMF	4
			Ionic equilibria	5
			Chemical kinetics	5
Arif	2rd	$III(Gr_{-}A)$	1 Qualitative analysis	15
Mohammad	(GEN)	Inorganic practical	2. Quantitative analysis	15

DISTRIBUTION OF SYLLABUS DEPARTMENT OF CHEMISTRY DUMKAL COLLEGE SESSION: 2018-2019 GENERAL COURSE

NAME OF TEACHER	YEAR	PAPER	CONTENT	NO OF PERIOD
ARIF MOHAMMAD	3 rd (GEN)	IV Gr-(A+B)	Amino acids and proteins	5
			Nucleosides and nucleotides	5
			Industrially important compounds	20
Dr. Sandip	3 rd	IV	Bio-inorganic chemistry	10
Kumar Rajak	(GEN)	Gr-(A+C)	Surface chemistry	5
			Colloids and macromolecules	5
			Catalysis	5
			Phase rule	5
Ujjwal Mondal	3 rd (GEN)	V Physical (Practical)	Physical Chemistry practical	21

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME:SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only). First Order Differential Equations and Integrating Factor.

Second Order Differential equations: Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

PHY-H-CC-T-02: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3Lectures) Motion of a particle under a central force field: Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effectson astronauts. (6 Lectures)

Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems.

PHY-H-GE-T-01: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures) Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures) Oscillations: Simple harmonic motion. Differential equation of SHM and its

solutions. Kinetic and Potential Energy, Total Energy and their time averages.

Principal Dumkal College, Basantapur Murshidabad, W.B.

Head of the Department Dept of Physics Dumkal College, Nurshidabad Damped oscillations. (6 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2018-19 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 **Lectures**) Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts. (6 Lectures)

Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 **Lectures**)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems. (4 Lectures)

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Magnetic Properties of Matter:

Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. B-H curve and hysteresis. **(3 Lectures)**

Electromagnetic Induction:

Faraday's Law. Lenz's Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. **(5 Lectures)**

Transients: Growth and decay of currents and voltages in L-R, C-R and L-C-R circuits; electrical oscillations in L-C circuits. (2 Lectures)

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Head of the Department Dept of Physics Dumkal College, Nurshidabad
Electrical Circuits: AC Circuits: Kirchhoff s laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. (4 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits. (4 Lectures)

Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge

Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. (3 Lectures)

PHY-H-CC-T-04: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. (5 Lectures)

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. (8 Lectures)

Fresnel Diffraction: Fresnel's Assumptions, Fresnel's Half-Period Zones for Plane Wave, Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's

Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 Lectures)

PHY-H-GE-T-02: WAVES AND OPTICS

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis.

(14 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light - production and analysis. Circular and elliptical polarization. (5 Lectures)

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. (5 Lectures)

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. (8 Lectures)

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 Lectures

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UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19

SYLLABUS DISTRIBUTION

2nd Year

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

ELECTRICITY AND MAGNETISM

Electric Field and Electric Potential:

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry.

(6 Lectures)

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole. (6 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. (10 Lectures)

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics. **(8 Lectures)**

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19

SYLLABUS DISTRIBUTION

3rd Year

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

QUANTUM MECHANICS AND APPLICATIONS

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum and Energy operators; commutator of position and momentum operators; Hermitian Operators, Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

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Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states. (5 Lectures)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method; Hermite polynomials; ground state, zero point energy & uncertainty principle. **(10 Lectures)**

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for second order partial differential equation; angular momentum operator & quantum numbers; Radial wavefunctions from Frobenius method; shapes of the probability densities for ground & first excited states; Orbital angular momentum quantum numbers 1 and m; s, p, d,..shells. (11 Lectures)

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. (11 Lectures)

Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (5 Lectures)

Many electron atoms: Pauli's Exclusion Principle. Symmetric & Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total angular momentum. Vector Model. Spin-orbit coupling in atoms- L-S and J-J couplings. Hund's Rule. Term symbols. Spectra of Hydrogen and Alkali Atoms (Na etc.). **(10 Lectures**

DIGITAL SYSTEMS AND APPLICATIONS

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. **(3 Lectures)**

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (3 Lectures)

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. **(6 Lectures)**

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (6 Lectures)

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.(4 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (5 Lectures)

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop. (6 Lectures) Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

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Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures) Counters(4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter.

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SSA

(4 Lectures)

Computer Organization: Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (6 Lectures) Intel 8085 Microprocessor Architecture: Main features of 8085. Block diagram. Components. Pinout diagram. Buses. Registers. ALU. Memory. Stack memory. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. (8 Lectures) Introduction to Assembly Language: 1 byte, 2 byte & 3 byte instructions. (4 Lectures)

ANALOG SYSTEMS AND APPLICATIONS

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width

and Current for Step Junction. (10 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Halfwave Rectifiers. Centretapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. (6 Lectures)

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC 21

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Configurations. Current gains α and β , Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

(6 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. **(10 Lectures)**

Coupled Amplifier: RC-coupled amplifier and its frequency response. **(4 Lectures) Feedback in Amplifiers:** Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. **(4 Lectures)**

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (**4 Lectures**)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3)Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (9 Lectures)

Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation) **(3 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2018-2019 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: SURAJITSAHA, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Orthogonal Curvilinear Coordinates:

Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. (4 Lectures)

Matrices: Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix. Hermitian and Skew- Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Eigen-values and Eigenvectors (Degenerate and nondegenerate). Cayley-Hamiliton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary homogeneous Differential Equations. Functions of a Matrix. (6 Lectures) Introduction to probability:

Independent random variables: Sample space and Probability distribution functions. Binomial, Gaussian, and Poisson distribution with examples. Mean and variance. (5 Lectures)

Dirac Delta function and its properties: (2)

Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function.

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PHY-H-CC-T-02: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. **Rotational Dynamics:** Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **Fluid Motion:** Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. Euler's Equation. Bernoulli's Theorem.

PHY-H-GE-T-01: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. **(5 Lectures)**

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, r j and o by Searles method. **(8 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-2019 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: SURAJITSAHA, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics. **(8 Lectures)** Magnetic Field:

Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. **(9 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS



Head of the Department Dept of Physics Dumkal College, Nurshidabad

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and equal frequency differences. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.**(6 Lectures)**

PHY-H-GE-T-02: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2018-19 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. (3 Lectures)

Rotational Dynamics: Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (12 Lectures)

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **(3 Lectures) Fluid Motion:** Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. (2 **Lectures)**

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CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2018-19 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle.

Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.

(5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses.

(2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves.

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction. **(6 Lectures)**

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19

SYLLABUS DISTRIBUTION

2nd Year

FACULTY NAME:SURAJIT SAHA, DUMKAL COLLEGE

Magnetic Field:

Magnetic force between current elements and definition of Magnetic FieldB. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.

(9 Lectures)

Magnetic Properties of Matter:

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Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. (4 Lectures)

Electromagnetic Induction:

Faraday's Law. Lenz's Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. Introduction to Maxwell's Equations. Charge Conservation and Displacement current.

(6 Lectures)

Electrical Circuits: AC Circuits: Kirchhoff s laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit.

(4 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits. **(4 Lectures)**

Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. **(3 Lectures)**

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19

SYLLABUS DISTRIBUTION

3rd Year

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

STATISTICAL MECHANICS

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) - Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature. **(18 Lectures)**

Classical Theory of Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff s law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Saha's Ionization Formula. Rayleigh-Jean's Law. Ultraviolet Catastrophe. **(9 Lectures)**

Quantum Theory of Radiation: Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law. **(5 Lectures)**

Bose-Einstein Statistics: B-E distribution law, Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law. (13 Lectures)

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Fermi-Dirac Statistics: Fermi-Dirac Distribution Law, Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals, Relativistic Fermi gas, White Dwarf Stars, Chandrasekhar Mass Limit. **(15 Lectures)**

SOLID STATE PHYSICS

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. **(12 Lectures)**

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids, T₃ law. (10 Lectures) **Magnetic Properties of Matter:** Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

ELECTROMAGNETIC THEORY

Maxwell Equations: Review of Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density. (**12 Lectures**)

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (10 Lectures)

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal incidence) (10 Lectures)

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's

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Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light. **(12 Lectures)**

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (5 Lectures)

Wave Guides: Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission. **(8 Lectures)**

Optical Fibres:- Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). **(3 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2018-19 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Vector Calculus:

Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (6 Lectures)

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. (7 Lectures)

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of

infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields.

Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proof)(10 Lectures)

PHY-H-CC-T-02: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket. (6 Lectures)

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force

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as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy. (4 Lectures)

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Four Vectors (definition and examples only). (10 Lectures)

PHY-H-GE-T-01: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)
Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities.

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<mark>Semester I</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket. (6 Lectures)

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy. **(4 Lectures)**

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number.

Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy

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Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. **(10 Lectures)**

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Semester II

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Electric Field and Electric Potential:

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. **(6 Lectures)**

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.(6 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. **(10 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. (4 lectures)

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PHY-H-GE-T-02: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave

front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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<mark>Semester II</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films:

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parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. **(4 Lectures)**

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19

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2nd Year

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

WAVES

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses.

(2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for

Velocity of Sound. Laplace's Correction. (6 Lectures)

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment.

Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves.(7 Lectures)

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2018-19

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SYLLABUS DISTRIBUTION

3rd Year

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

CLASSICAL MECHANICS

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. Hamilton's equations of motion. Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. Poisson brackets. Canonical transformations. **(22 Lectures)**

PHYSICAL OPTICS

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. **(4 Lectures)**

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. (5 Lectures)

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 **Lectures)**

NUCLEAR PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell

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structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

Radioactivity decay:(a) Alpha decay: basics of α -decay processes, theory of a-emission, Gamow factor, Geiger Nuttall law, α -decay spectroscopy. (b) (β - decay: energy kinematics for (β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(8 Lectures)**

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Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. **(5 Lectures)**

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. **(5 Lectures)**

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. **(14 Lectures)**

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<mark>Semester I</mark>

FACULTY NAME:SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only). First Order Differential Equations and Integrating Factor.

Second Order Differential equations: Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

PHY-H-CC-T-02: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3Lectures) Motion of a particle under a central force field: Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effectson astronauts. (6 Lectures)

Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems.

PHY-H-GE-T-01: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures) Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures) Oscillations: Simple harmonic motion. Differential equation of SHM and its

solutions. Kinetic and Potential Energy, Total Energy and their time averages.



Damped oscillations. (6 Lectures)

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Semester I

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Orthogonal Curvilinear Coordinates:

Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. (4 Lectures)

Matrices: Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix. Hermitian and Skew- Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Eigen-values and Eigenvectors (Degenerate and nondegenerate). Cayley-Hamiliton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary homogeneous Differential Equations. Functions of a Matrix. (6 Lectures)

Introduction to probability:

Independent random variables: Sample space and Probability distribution functions. Binomial, Gaussian, and Poisson distribution with examples. Mean and variance. (5 Lectures) Dirac Delta function and its properties: (2)

Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function.

PHY-H-CC-T-02: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. Rotational Dynamics: Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. Fluid Motion: Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. Euler's Equation. Bernoulli's Theorem.

PHY-H-GE-T-01: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (5 Lectures)

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work



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done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, rj and o by Searles method. (8 Lectures)

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Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-02: ELECTRICITY AND MAGNETISM

Theory:

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. **(22 Lectures)**

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Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics. **(8 Lectures)** Magnetic Field:

Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. **(9 Lectures)**

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PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and equal frequency differences. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.**(6**

Lectures)

PHY-H-GE-T-02: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

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Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Planck's quantum, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. (14 Lectures)

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating

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minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction. **(5 Lectures)**

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Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-06: THERMAL PHYSICS

Introduction to Thermodynamics

Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroeth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law & various processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient. (8 Lectures)

Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (10 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature-Entropy diagrams for Carnot's Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (7 Lectures)

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations. (7 Lectures)

Maxwell's Thermodynamic Relations: Derivations and applications of Maxwell's Relations, Maxwell's Relations:(1) Clausius Clapeyron equation, (2) Values of Cp- Cv, (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (7 **Lectures**)

Kinetic Theory of Gases Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (7 Lectures)

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Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance. **(4 Lectures)**

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. p-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule- Thomson Cooling. **(10 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers (half wave and full wave rectifier with L, C, L-C filter arrangement, regulation). Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources. (4 Lectures)
Electrical Protection: Relays, Fuses and disconnect switches, Working principle of Circuit breakers, Miniature circuit breaker and its types. (3 Lectures)
Electrical Wiring: Conduit wiring (basic idea of house hold wiring). Basics of wiring: Star and Delta Connections. Preparation of extension board, Wiring Materials (Basic information about the wiring

components). (2 Lectures)

PHY-H-GE-T-03: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. **(5 Lectures)**

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, r j and o by Searles method. **(8 Lectures)**

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE



PHY-G-CC-T-04: SOLID STATE PHYSICS

Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

(12 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T3 law (10 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2022-23 SYLLABUS DISTRIBUTION

Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-09: ELEMENTS OF MODERN PHYSICS

Planck's quantum hypothesis, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson- Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**

Position measurement- gamma ray microscope thought experiment; Waveparticle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction. **(5 Lectures)**

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. **(10 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers. (6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. (8 Lectures)

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Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). **(3 Lectures)** Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three- Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. **(4 Lectures)**

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. (4 Lectures) Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

PHY-H-GE-T-04: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures) Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. **(22 Lectures)**



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<mark>Semester V</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-12: STATISTICAL MECHANICS

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) - Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature. **(18 Lectures)**

Classical Theory of Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff s law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Saha's Ionization Formula. Rayleigh-Jean's Law. Ultraviolet Catastrophe. **(9 Lectures)**

Quantum Theory of Radiation: Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law. **(5 Lectures)**

Bose-Einstein Statistics: B-E distribution law, Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law. (13 Lectures)

Fermi-Dirac Statistics: Fermi-Dirac Distribution Law, Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals, Relativistic Fermi gas, White Dwarf Stars, Chandrasekhar Mass Limit. **(15 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Special Theory of Relativity: Geometrical interpretation of Space-time:Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. Intervals: space-like, time-like & light-like. Four velocity and acceleration. Elementary idea of tensors: Covariant and contravariant tensors, Metric and alternating tensors. Four-momentum and energymomentum relation. Doppler effect from a four-vector perspective. Concept of four-force. Conservation of four-momentum. Relativistic kinematics

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Semester VI



FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. **(5 Lectures)**

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular

momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. (14 Lectures)

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<mark>Semester VI</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-14: SOLID STATE PHYSICS

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. **(12 Lectures)**

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids, T₃ law. (10 Lectures) Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

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Head of the Department Dept of Physics Dumkal College, Nurshidabad

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2022-23 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 **Lectures**) Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts. (6 Lectures)

Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems. (4 Lectures)

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<mark>Semester II</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-02: ELECTRICITY AND MAGNETISM

Theory:

Magnetism: Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction,



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permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferromagnetic materials. (10 Lectures)

Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization. (10 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2022-23 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Magnetic Properties of Matter:

Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. B-H curve and hysteresis. (3 Lectures)

Electromagnetic Induction:

Faraday's Law. Lenz's Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. **(5 Lectures)**

Transients: Growth and decay of currents and voltages in L-R, C-R and L-C-R circuits; electrical oscillations in L-C circuits. (2 Lectures)

Electrical Circuits: AC Circuits: Kirchhoff s laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. (4 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits. **(4 Lectures)**

Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. **(3 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 **Lectures**)

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier.

(10 Lectures)

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-07: ANALOG SYSTEMS AND APPLICATIONS

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram.

Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (10 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Halfwave Rectifiers. Centretapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. **(6 Lectures)**

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β , Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

(6 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. **(10 Lectures)**

Coupled Amplifier: RC-coupled amplifier and its frequency response. (4 Lectures)

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Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. (4 Lectures)

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. **(4 Lectures)**

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (4 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3)Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (9 Lectures)

Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation) **(3 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources (principle of generation, output wave form, advantage of using three-phase). Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. **(8Lectures)**

Electric Motors: Single-phase, three-phase & DC motors. Basic design. Speed & power of ac motor. **(3 Lectures**

PHY-H-GE-T-03: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures) Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures) Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures)

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE



PHY-G-CC-T-04: SOLID STATE PHYSICS

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-10: DIGITAL SYSTEMS AND APPLICATIONS

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. **(3 Lectures)**

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (3 Lectures)

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. **(6 Lectures)**

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (6 Lectures)

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.(4 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (5 Lectures)

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop. (6 Lectures) Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters(4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Principal Dumkal College, Basantapur Murshidah

Head of the Department Dept of Physics Dumkal College, Nurshidabad

Computer Organization: Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (6 Lectures) Intel 8085 Microprocessor Architecture: Main features of 8085. Block diagram. Components. Pinout diagram. Buses. Registers. ALU. Memory. Stack memory. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. (8 Lectures) Introduction to Assembly Language: 1 byte, 2 byte & 3 byte instructions. (4 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

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Semester V

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM Magnetism:

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferro magnetic materials. (10 Lectures) Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization.

(10 Lectures)

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Semester V



FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-11: QUANTUM MECHANICS AND APPLICATIONS

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum and Energy operators; commutator of position and momentum operators; Hermitian Operators, Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states. (5 Lectures)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method; Hermite polynomials; ground state, zero point energy & uncertainty principle. (10 Lectures)

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for second order partial differential equation; angular momentum operator & quantum numbers; Radial wavefunctions from Frobenius method; shapes of the probability densities for ground & first excited states; Orbital angular momentum quantum numbers 1 and m; s, p, d,..shells. (11 Lectures)

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. (11 Lectures)

Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (5 Lectures)

Many electron atoms: Pauli's Exclusion Principle. Symmetric & Antisymmetric Wave Functions.

Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total angular momentum. Vector Model. Spin-orbit coupling in atoms- L-S and J-J couplings. Hund's Rule.

Term symbols. Spectra of Hydrogen and Alkali Atoms (Na etc.). (10 Lectures)

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Application to two-body decay of an unstable particle. The Electromagnetic field tensor and its transformation under Lorentz transformations: relation to known transformation properties of E and B. Electric and magnetic fields due to a uniformly moving charge. Equation of motion of charged particle & Maxwell's equations in tensor form. Motion of charged particles in external electric and magnetic fields. **(38 Lectures)**

Electromagnetic radiation: Review of retarded potentials. Potentials due to a moving charge: Lienard Wiechert potentials. Electric & Magnetic fields due to a moving charge: Power radiated, Larmor's formula. **(15 Lectures)**

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<mark>Semester VI</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

Radioactivity decay:(a) Alpha decay: basics of a-decay processes, theory of a- emission, Gamow factor, Geiger Nuttall law, a-decay spectroscopy. (b) (3-decay: energy kinematics for (3-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering(Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. **(5 Lectures)**

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

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Semester VI

FACULTY NAME: SIRAJUKL SK, DUMKAL COLLEGE

PHY-H-CC-T-13: ELECTROMAGNETIC THEORY

Maxwell Equations: Review of Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density. (12 Lectures)
EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (10 Lectures)
EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal incidence) (10 Lectures)

Principal Dumkal College, Basantapur Murshidahad W B.

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light. (**12 Lectures**)

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (5 Lectures)

Wave Guides: Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission. **(8 Lectures)**

Optical Fibres:- Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). **(3 Lectures)**

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Semester I

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Vector Calculus:

Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (6)

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. (7)

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proof)(10)

PHY-H-CC-T-02: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass.



SSA.

Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket.

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy.

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Four Vectors (definition and examples only).

PHY-H-GE-T-01: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. **(4 Lectures)**

Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)

Momentum and Energy: Conservation of momentum. Work and energy.

Conservation of energy. Motion of rockets. (6 Lectures)

Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities.

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<mark>Semester I</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket. **(6 Lectures)**

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy. **(4 Lectures)**

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special

Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz

contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number.

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Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. **(10 Lectures)**

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<mark>Semester II</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Electric Field and Electric Potential:

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. **(6 Lectures)**

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.(6 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. **(10 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer.

Principal Dumkal College, Basantapur Murshidabad, W.B.

PHY-H-GE-T-02: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. (6 Lectures)

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave

front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester II

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-02: ELECTRICITY AND MAGNETISM

Theory: 60 Lectures

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). **(12 Lectures)**

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. **(6 Lectures)**

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-05: MATHEMATICAL PHYSICS-II

Fourier Series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier Series. Parseval Identity. (14 Lectures)

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Bessel Functions of the First Kind: Generating Function, simple recurrence relations. Zeros of Bessel Functions and Orthogonality. (24 Lectures) Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (4 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Wave equation and its solution for vibrational modes of a stretched string, rectangular and circular membranes. **(14 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law, Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with digital multimeter (name of the circuit elements and their ranges), Analog voltmeter and analog ammeter. **(6 Lectures)**

Generators and Transformers: DC Power sources (basic idea). AC and DC generators (basic principle of action). Inductance, capacitance, and impedance. Operation of transformers (Step-up and step-down). **(4 Lectures)**

PHY-H-GE-T-03: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)



Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. (7 Lectuers)

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

(6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

(8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions).

(3 Lectures)

Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. (4 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-08: MATHEMATICAL PHYSICS-III

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables.



SSA

Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula. Simply and multiply connected region. Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. (30 Lectures)

Integrals Transforms:

Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (15 Lectures) Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (15 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. (3 Lectures)

Solar energy: Solar energy, It's importance, storage of solar energy (Thermal storage and Electrical storage, Mechanical storage), solar pond (Basic idea), Principle of operation of non convective solar pond, applications of solar pond, solar water heating, flat plate collector, solar cooker (basic idea, Design principle and Constructional details of box type solar cooker and its limitation), solar furnace, solar green houses (basic idea, types and advantage), Solar Cell principle (No mathematical treatment), application of solar photovoltaic system, advantage and disadvantage of Photovoltaic solar energy conversion. **(6 Lectures)**

PHY-H-GE-T-04: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Principal Dumkal College, Basantapur Murshidahad W B.

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. **(8 Lectures)**

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A



plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

Radioactivity decay: (a) Alpha decay: basics of α -decay processes, theory of a-emission, Gamow factor, Geiger Nuttall law, α -decay spectroscopy. (b) (β - decay: energy kinematics for (β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. **(5 Lectures)**

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. (5 Lectures)

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. **(14 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. Hamilton's equations of motion. Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. Poisson brackets. Canonical transformations.

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<mark>Semester V</mark>

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FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). **(12 Lectures)**

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. **(6 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2022-23 SYLLABUS DISTRIBUTION

Semester VI

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-DSE-T-03: NANO MATERIALS AND APPLICATIONS

NANOSCALE SYSTEMS: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation-Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences. (12 Lectures)

SYNTHESIS OF NANOSTRUCTURE MATERIALS: Top down and Bottom up approach, Photolithography. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, Ebeam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spraypyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. (10 Lectures)

CHARACTERIZATION: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Transmission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy. (10 Lectures)

OPTICAL PROPERTIES: Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasi-particles and excitons, charging effects. Radiative processes: General formalizationabsorption, emission and luminescence. Optical properties of heterostructures and nanostructures. (16 Lectures)

ELECTRON TRANSPORT: Carrier transport in nanostrutures. Coulomb blockade effect, thermionic emission, tunneling and hoping conductivity. Defects and impurities: Deep level and surface defects. (9 Lectures)

APPLICATIONS: Applications of nanoparticles, quantum dots, nano wires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors.

Nanomaterial Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical

Systems (MEMS), Nano Electromechanical Systems (NEMS). (18 Lectures)

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Semester VI

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

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<mark>Semester I</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 **Lectures**) Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts. (6 Lectures) Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power

dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems. (4 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2020-21 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME:SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only). First Order Differential Equations and Integrating Factor.

Second Order Differential equations: Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

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PHY-H-CC-T-02: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3Lectures) Motion of a particle under a central force field: Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effectson astronauts. (6 Lectures) Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution.

Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems.

PHY-H-GE-T-01: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures)
Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures)
Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures)

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 Lectures

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Magnetic Properties of Matter:

Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. B-H curve and hysteresis. (3 Lectures)

Electromagnetic Induction:

Faraday's Law. Lenz's Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. **(5 Lectures)**

Transients: Growth and decay of currents and voltages in L-R, C-R and L-C-R circuits; electrical oscillations in L-C circuits. (2 Lectures)

Electrical Circuits: AC Circuits: Kirchhoff s laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. (4 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits. **(4 Lectures)**

Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. **(3 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 **Lectures)**

PHY-H-GE-T-02: WAVES AND OPTICS

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis.

(14 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light - production and analysis. Circular and elliptical polarization. (5 Lectures)



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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier.

(10 Lectures)

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-07: DIGITAL SYSTEMS AND APPLICATIONS

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. **(3 Lectures)**

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (3 Lectures)

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. **(6 Lectures)**

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth

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table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (6 Lectures)

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.(4 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (5 Lectures)

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop. (6 Lectures) Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters(4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Computer Organization: Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (6 Lectures) Intel 8085 Microprocessor Architecture: Main features of 8085. Block diagram. Components. Pinout diagram. Buses. Registers. ALU. Memory. Stack memory. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. (8 Lectures) Introduction to Assembly Language: 1 byte, 2 byte & 3 byte instructions. (4 Lectures)

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources (principle of generation, output wave form, advantage of using three-phase). Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. **(8Lectures)**

Electric Motors: Single-phase, three-phase & DC motors. Basic design. Speed & power of ac motor. **(3 Lectures**

PHY-H-GE-T-03: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures) Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures)



Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures)

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-10: ANALOG SYSTEMS AND APPLICATIONS

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (10 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Halfwave Rectifiers. Centretapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. **(6 Lectures)**

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β , Relations between α and β . Load Line analysis of Transistors.

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DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

(6 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. **(10 Lectures)**

Coupled Amplifier: RC-coupled amplifier and its frequency response. **(4 Lectures) Feedback in Amplifiers:** Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. **(4 Lectures)**

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (**4 Lectures**)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3)Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (9 Lectures)

Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D

Conversion (successive approximation) (3 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. **(5 Lectures)**

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

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<mark>Semester V</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM Magnetism:



Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferro magnetic materials. (10 Lectures) Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization.

(10 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-11: QUANTUM MECHANICS AND APPLICATIONS

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum and Energy operators; commutator of position and momentum operators; Hermitian Operators, Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states. (5 Lectures)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method; Hermite polynomials; ground state, zero point energy & uncertainty principle. (10 Lectures)

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for second order partial differential equation; angular momentum operator & quantum numbers; Radial wavefunctions from Frobenius method; shapes of the probability densities for ground & first excited states; Orbital angular momentum quantum numbers l and m; s, p, d,..shells. (11 Lectures)

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. (11 Lectures)

Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (5 Lectures)

Many electron atoms: Pauli's Exclusion Principle. Symmetric & Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total

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angular momentum. Vector Model. Spin-orbit coupling in atoms- L-S and J-J couplings. Hund's Rule. Term symbols. Spectra of Hydrogen and Alkali Atoms (Na etc.). **(10 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Application to two-body decay of an unstable particle. The Electromagnetic field tensor and its transformation under Lorentz transformations: relation to known transformation properties of E and B. Electric and magnetic fields due to a uniformly moving charge. Equation of motion of charged particle & Maxwell's equations in tensor form. Motion of charged particles in external electric and magnetic fields. **(38 Lectures)**

Electromagnetic radiation: Review of retarded potentials. Potentials due to a moving charge: Lienard Wiechert potentials. Electric & Magnetic fields due to a moving charge: Power radiated, Larmor's formula. **(15 Lectures)**

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Semester VI

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

Radioactivity decay:(a) Alpha decay: basics of a-decay processes, theory of a- emission, Gamow factor, Geiger Nuttall law, a-decay spectroscopy. (b) (3-decay: energy kinematics for (3-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering(Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. (5 Lectures)

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

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Semester VI

FACULTY NAME: SIRAJUKL SK, DUMKAL COLLEGE



PHY-H-CC-T-13: ELECTROMAGNETIC THEORY

Maxwell Equations: Review of Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density. (**12 Lectures**)

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. **(10 Lectures)**

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal incidence) (10 Lectures)

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light. (**12 Lectures**)

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. **(5 Lectures)**

Wave Guides: Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission. **(8 Lectures)**

Optical Fibres:- Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). **(3 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2020-2021 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Orthogonal Curvilinear Coordinates:

Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. (4 Lectures) Matrices: Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit

Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix.



SSA

Hermitian and Skew- Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Eigen-values and Eigenvectors (Degenerate and non-degenerate). Cayley-Hamiliton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary homogeneous Differential Equations. Functions of a Matrix. (6 Lectures) Introduction to probability:

Independent random variables: Sample space and Probability distribution functions. Binomial, Gaussian, and Poisson distribution with examples. Mean and variance. (5 Lectures)

Dirac Delta function and its properties: (2)

Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function.

PHY-H-CC-T-02: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. **Rotational Dynamics:** Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **Fluid Motion:** Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. Euler's Equation. Bernoulli's Theorem.

PHY-H-GE-T-01: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (5 Lectures)

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, r j and o by Searles method. **(8 Lectures)**

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Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics. **(8 Lectures)** Magnetic Field:

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Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. **(9 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and equal frequency differences. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.**(6 Lectures)**

PHY-H-GE-T-02: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

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Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-06: THERMAL PHYSICS Introduction to Thermodynamics



Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroeth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law & various processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient. (8 Lectures)

Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (10 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature-Entropy diagrams for Carnot's Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (7 Lectures)

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations. (7 Lectures)

Maxwell's Thermodynamic Relations: Derivations and applications of Maxwell's Relations, Maxwell's Relations:(1) Clausius Clapeyron equation, (2) Values of Cp- Cv, (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (7 **Lectures**)

Kinetic Theory of Gases Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (7 Lectures)

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance. **(4 Lectures)**

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. p-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion.

Joule- Thomson Cooling. (10 Lectures)

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Principal Dumkal College, Basantapur Murshidak ad W.B.

Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers (half wave and full wave rectifier with L, C, L-C filter arrangement, regulation). Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources. **(4 Lectures)**

Electrical Protection: Relays, Fuses and disconnect switches, Working principle of Circuit breakers, Miniature circuit breaker and its types. **(3 Lectures)**

Electrical Wiring: Conduit wiring (basic idea of house hold wiring). Basics of wiring: Star and Delta Connections. Preparation of extension board, Wiring Materials (Basic information about the wiring components). **(2 Lectures)**

PHY-H-GE-T-03: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (5 Lectures)

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, rj and o by Searles method. **(8 Lectures)**

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-09: ELEMENTS OF MODERN PHYSICS

Planck's quantum hypothesis, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson- Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**

Position measurement- gamma ray microscope thought experiment; Waveparticle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction. **(5 Lectures)**

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic

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particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. **(10 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers. (6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. (8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). **(3 Lectures)** Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions.

Optical Pumping and Population Inversion. Three- Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. (4 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

PHY-H-GE-T-04: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-12: SOLID STATE PHYSICS

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. **(12 Lectures)**

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids, T3 law. (10 Lectures) Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains.

Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Special Theory of Relativity: Geometrical interpretation of Space-time:Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. Intervals: space-like, time-like & light-like. Four velocity and acceleration. Elementary idea of tensors: Covariant and contravariant tensors, Metric and alternating tensors. Four-momentum and energymomentum relation. Doppler effect from a four-vector perspective. Concept of four-force. Conservation of four-momentum. Relativistic kinematics

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Semester VI

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-14: STATISTICAL MECHANICS

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) - Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature. **(18 Lectures)**

Classical Theory of Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff s law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Saha's Ionization Formula. Rayleigh-Jean's Law. Ultraviolet Catastrophe. (9 Lectures)

Quantum Theory of Radiation: Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law. **(5 Lectures)**

Bose-Einstein Statistics: B-E distribution law, Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law. (13 Lectures)

Fermi-Dirac Statistics: Fermi-Dirac Distribution Law, Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals, Relativistic Fermi gas, White Dwarf Stars, Chandrasekhar Mass Limit. **(15 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (GENERAL) THE ACADEMIC SESSION 2020-21 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. (3 Lectures)



Rotational Dynamics: Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (12 Lectures)

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **(3 Lectures) Fluid Motion:** Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. (2 **Lectures)**

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Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.

(5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses.

(2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves.

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction. **(6 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (GENERAL) THE ACADEMIC SESSION 2020-21 SYLLABUS DISTRIBUTION

Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Planck's quantum, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and



matter waves; Davisson-Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction.

(5 Lectures)

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

(12 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T3 law (10 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. **(22 Lectures)**

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<mark>Semester VI</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. (6 Lectures)
Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. (5 Lectures)
Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular

momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. (14 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2021-22 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Vector Calculus:

Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields.

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. **Vector Integration**: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proof)

PHY-H-CC-T-02: MECHANICS

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Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket.

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy.

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Four Vectors (definition and examples only).

PHY-H-GE-T-01: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)

Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities.

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (GENERAL) THE ACADEMIC SESSION 2020-21 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket. **(6 Lectures)**

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy. **(4 Lectures)**

Dumkal College, Basantapur

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. **(10 Lectures**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2021-22 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Electric Field and Electric Potential:

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. **(6 Lectures)**

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.(6 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. **(10 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Principal Dumkal College, Basantapur Murshidahad W B.

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer.

PHY-H-GE-T-02: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester II

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)



Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. **(4 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2021-22 SYLLABUS DISTRIBUTION

Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-05: MATHEMATICAL PHYSICS-II

Fourier Series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier Series. Parseval Identity. (14 Lectures) Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Bessel Functions of the First Kind: Generating Function, simple recurrence relations. Zeros of Bessel Functions and Orthogonality. (24 Lectures) Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (4 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Wave equation and its solution for vibrational modes of a stretched string, rectangular and circular membranes. **(14 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Principal Dumkal College, Basantapur Murshidahad W B.
Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law, Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with digital multimeter (name of the circuit elements and their ranges), Analog voltmeter and analog ammeter. **(6 Lectures)**

Generators and Transformers: DC Power sources (basic idea). AC and DC generators (basic principle of action). Inductance, capacitance, and impedance. Operation of transformers (Step-up and step-down). **(4 Lectures)**

PHY-H-GE-T-03: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)
Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

(6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

(8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions).

(3 Lectures)

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Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. (4 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-08: MATHEMATICAL PHYSICS-III

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula. Simply and multiply connected region. Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. (30 Lectures)

Integrals Transforms:

Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (15 Lectures) Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (15 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. (3 Lectures)

Solar energy: Solar energy, It's importance, storage of solar energy (Thermal storage and Electrical storage, Mechanical storage), solar pond (Basic idea), Principle of operation of non convective solar pond, applications of solar pond, solar water heating, flat plate collector, solar cooker (basic idea, Design principle and Constructional details of box type solar cooker and its limitation), solar



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furnace, solar green houses (basic idea, types and advantage), Solar Cell principle (No mathematical treatment), application of solar photovoltaic system, advantage and disadvantage of Photovoltaic solar energy conversion. **(6 Lectures)**

PHY-H-GE-T-04: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. **(8 Lectures)**

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye



equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. **(8 Lectures)**

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<mark>Semester V</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

Radioactivity decay:(a) Alpha decay: basics of α -decay processes, theory of a-emission, Gamow factor, Geiger Nuttall law, α -decay spectroscopy. (b) (β - decay: energy kinematics for (β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. (5 Lectures)

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. **(5 Lectures)**

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. **(14 Lectures)**

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PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. Hamilton's equations of motion. Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. Poisson brackets. Canonical transformations.

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<mark>Semester V</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). **(12 Lectures)**

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. **(6 Lectures)**

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<mark>Semester VI</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-DSE-T-03: NANO MATERIALS AND APPLICATIONS

NANOSCALE SYSTEMS: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences. (12 Lectures)

SYNTHESIS OF NANOSTRUCTURE MATERIALS: Top down and Bottom up approach, Photolithography. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, Ebeam evaporation, Pulsed Laser deposition. Chemical

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vapor deposition (CVD). Sol-Gel. Electro deposition. Spraypyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. **(10 Lectures)**

CHARACTERIZATION: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Transmission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy. (10 Lectures)

OPTICAL PROPERTIES: Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasi-particles and excitons, charging effects. Radiative processes: General formalizationabsorption, emission and luminescence. Optical properties of heterostructures and nanostructures. (16 Lectures)

ELECTRON TRANSPORT: Carrier transport in nanostrutures. Coulomb blockade effect, thermionic emission, tunneling and hoping conductivity. Defects and impurities: Deep level and surface defects. (9 Lectures)

APPLICATIONS: Applications of nanoparticles, quantum dots, nano wires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors.

Nanomaterial Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS). **(18 Lectures)**

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Semester VI

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

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<mark>Semester I</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only). First Order Differential Equations and Integrating Factor.

Second Order Differential equations: Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

PHY-H-CC-T-02: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3Lectures) Motion of a particle under a central force field: Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effectson astronauts. (6 Lectures)

Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems.

PHY-H-GE-T-01: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures) Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures) Oscillations: Simple harmonic motion. Differential equation of SHM and its

solutions. Kinetic and Potential Energy, Total Energy and their time averages.

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Damped oscillations. (6 Lectures) CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2021-22 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 Lectures) Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts. (6 Lectures) Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures) Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems. (4 Lectures)

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 Lectures

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone

Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 Lectures

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier.

(10 Lectures)

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE



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PHY-H-CC-T-07: DIGITAL SYSTEMS AND APPLICATIONS

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. **(3 Lectures)**

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (3 Lectures)

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. **(6 Lectures)**

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (6 Lectures)

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.(4 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (5 Lectures)

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop. (6 Lectures) Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters(4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Computer Organization: Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (6 Lectures) Intel 8085 Microprocessor Architecture: Main features of 8085. Block diagram. Components. Pinout diagram. Buses. Registers. ALU. Memory. Stack memory. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. (8 Lectures)

Introduction to Assembly Language: 1 byte, 2 byte & 3 byte instructions. (4 Lectures)

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources (principle of generation, output wave form, advantage of using three-phase). Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. **(8Lectures)**

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Electric Motors: Single-phase, three-phase & DC motors. Basic design. Speed & power of ac motor. **(3 Lectures**

PHY-H-GE-T-03: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures)
Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures)
Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures)

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE



PHY-H-CC-T-10: ANALOG SYSTEMS AND APPLICATIONS

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram.

Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (10 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Halfwave Rectifiers. Centretapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. **(6 Lectures)**

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β , Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

(6 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. **(10 Lectures)**

Coupled Amplifier: RC-coupled amplifier and its frequency response. **(4 Lectures) Feedback in Amplifiers:** Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. **(4 Lectures)**

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (4 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3)Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (9 Lectures)

Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation) **(3 Lectures)**

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

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<mark>Semester V</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Magnetism:

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferro magnetic materials. (10 Lectures) Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization.

(10 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-11: QUANTUM MECHANICS AND APPLICATIONS

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum and Energy operators; commutator of position and momentum operators; Hermitian Operators, Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states. (5 Lectures)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method; Hermite polynomials; ground state, zero point energy & uncertainty principle. (10 Lectures)

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for second order partial differential equation; angular

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momentum operator & quantum numbers; Radial wavefunctions from Frobenius method; shapes of the probability densities for ground & first excited states; Orbital angular momentum quantum numbers l and m; s, p, d,..shells. (11 Lectures)

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. (11 Lectures)

Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (5 Lectures)

Many electron atoms: Pauli's Exclusion Principle. Symmetric & Antisymmetric Wave Functions.

Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total angular momentum. Vector Model. Spin-orbit coupling in atoms- L-S and J-J couplings. Hund's Rule. Term symbols. Spectra of Hydrogen and Alkali Atoms (Na etc.). **(10 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Application to two-body decay of an unstable particle. The Electromagnetic field tensor and its transformation under Lorentz transformations: relation to known transformation properties of E and B. Electric and magnetic fields due to a uniformly moving charge. Equation of motion of charged particle & Maxwell's equations in tensor form. Motion of charged particles in external electric and magnetic fields. **(38 Lectures)**

Electromagnetic radiation: Review of retarded potentials. Potentials due to a moving charge: Lienard Wiechert potentials. Electric & Magnetic fields due to a moving charge: Power radiated, Larmor's formula. **(15 Lectures)**

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Semester VI

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

Radioactivity decay:(a) Alpha decay: basics of a-decay processes, theory of a- emission, Gamow factor, Geiger Nuttall law, a-decay spectroscopy. (b) (3-decay: energy kinematics for (3-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering(Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. **(5 Lectures)**

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Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

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<mark>Semester VI</mark>

FACULTY NAME: SIRAJUKL SK, DUMKAL COLLEGE

PHY-H-CC-T-13: ELECTROMAGNETIC THEORY

Maxwell Equations: Review of Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density. (12 Lectures) EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic

dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (10 Lectures)

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal incidence) (10 Lectures)

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light. (**12 Lectures**)

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. **(5 Lectures)**

Wave Guides: Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission. **(8 Lectures)**

Optical Fibres:- Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). **(3 Lectures)**

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Head of the Department Dept of Physics Dumkal College, Nurshidabad

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<mark>Semester I</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Orthogonal Curvilinear Coordinates:

Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. (4 Lectures)

Matrices: Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix. Hermitian and Skew- Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Eigen-values and Eigenvectors (Degenerate and nondegenerate). Cayley-Hamiliton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary homogeneous Differential Equations. Functions of a Matrix. (6 Lectures)

Introduction to probability:

Independent random variables: Sample space and Probability distribution functions. Binomial, Gaussian, and Poisson distribution with examples. Mean and variance. (5 Lectures)

Dirac Delta function and its properties: (2)

Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function.

PHY-H-CC-T-02: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. **Rotational Dynamics:** Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **Fluid Motion**: Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. Euler's Equation. Bernoulli's Theorem.

PHY-H-GE-T-01: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (5 Lectures)

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, r j and o by Searles method. **(8 Lectures)**

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Semester I

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. (3 Lectures)

Rotational Dynamics: Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (12 Lectures)

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **(3 Lectures) Fluid Motion:** Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. (2 **Lectures)**

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Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.

(5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses.

(2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves.

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction. **(6 Lectures)**

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Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics. (8 Lectures)

Magnetic Field:

Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. (9 Lectures)

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and equal frequency differences. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.(6 Lectures)

PHY-H-GE-T-02: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). (4 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)



Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

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Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Planck's quantum, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction. (5 Lectures)

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Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-06: THERMAL PHYSICS

Introduction to Thermodynamics

Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroeth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law & various processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient. (8 Lectures)

Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Applications of Second Law of

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Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (10 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature-Entropy diagrams for Carnot's Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (7 Lectures)

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations. (7 Lectures)

Maxwell's Thermodynamic Relations: Derivations and applications of Maxwell's Relations, Maxwell's Relations:(1) Clausius Clapeyron equation, (2) Values of Cp- Cv, (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (7 Lectures)

Kinetic Theory of Gases Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (7 Lectures)

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance. **(4 Lectures)**

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. p-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule- Thomson Cooling. **(10 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers (half wave and full wave rectifier with L, C, L-C filter arrangement, regulation). Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources. **(4 Lectures)**

Electrical Protection: Relays, Fuses and disconnect switches, Working principle of Circuit breakers, Miniature circuit breaker and its types. **(3 Lectures)**

Electrical Wiring: Conduit wiring (basic idea of house hold wiring). Basics of wiring: Star and Delta Connections. Preparation of extension board, Wiring Materials (Basic information about the wiring components). **(2 Lectures)**

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PHY-H-GE-T-03: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (5 Lectures)

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, r j and o by Searles method. **(8 Lectures)**

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

(12 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T3 law (10 Lectures)

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-09: ELEMENTS OF MODERN PHYSICS

Planck's quantum hypothesis, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson- Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**



Position measurement- gamma ray microscope thought experiment; Waveparticle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction. **(5 Lectures)** Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. **(10 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers. (6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. (8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). **(3 Lectures) Lasers:** Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three- Level and Four-Level Lasers. Ruby Laser and He-

Ne Laser. (4 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

PHY-H-GE-T-04: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). (4 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical

Principal Dumkal College, Basantapur Murshidahad W B.

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Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures) Waves Motion- General:** Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. **(22 Lectures)**

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<mark>Semester V</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-12: SOLID STATE PHYSICS

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. **(12 Lectures)**

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids, T₃ law. (10 Lectures) Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

Principal Dumkal College, Basantapur Murshidahad W B.

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Special Theory of Relativity: Geometrical interpretation of Space-time:Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. Intervals: space-like, time-like & light-like. Four velocity and acceleration. Elementary idea of tensors: Covariant and contravariant tensors, Metric and alternating tensors. Four-momentum and energymomentum relation. Doppler effect from a four-vector perspective. Concept of four-force. Conservation of four-momentum. Relativistic kinematics

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<mark>Semester VI</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. **(5 Lectures)**

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular

momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. (14 Lectures)

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Semester VI

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-14: STATISTICAL MECHANICS

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) - Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature. **(18 Lectures)**

Classical Theory of Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff s law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Saha's Ionization Formula. Rayleigh-Jean's Law. Ultraviolet Catastrophe. (9 Lectures)

Quantum Theory of Radiation: Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law. **(5 Lectures)**

Bose-Einstein Statistics: B-E distribution law, Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law. (13 Lectures)

Fermi-Dirac Statistics: Fermi-Dirac Distribution Law, Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals, Relativistic Fermi gas, White Dwarf Stars, Chandrasekhar Mass Limit. **(15 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2021-22 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I Vector Calculus:

Principal Dumkal College, Basantapur Murshidal

Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields.

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. **Vector Integration**: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields.

Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proof)

PHY-H-CC-T-02: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket.

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy.

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Four Vectors (definition and examples only).

PHY-H-GE-T-01: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)
Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities.

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Semester I

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket. **(6 Lectures)**

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy. **(4 Lectures)**

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. **(10 Lectures)**

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<mark>Semester II</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Electric Field and Electric Potential:

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. **(6 Lectures)**

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.(6 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. **(10 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Principal Dumkal College, Basantapur Murshidabad, W.B.

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer.

PHY-H-GE-T-02: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester II



FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. **(4 Lectures)**

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-05: MATHEMATICAL PHYSICS-II

Fourier Series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier Series. Parseval Identity. (14 Lectures) Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Bessel Functions of the First Kind: Generating Function, simple recurrence relations. Zeros of Bessel Functions and Orthogonality. (24 Lectures) Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (4 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

Principal Dumkal College, Basantapur Murshidahad W B.

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Wave equation and its solution for vibrational modes of a stretched string, rectangular and circular membranes. **(14 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law, Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with digital multimeter (name of the circuit elements and their ranges), Analog voltmeter and analog ammeter. **(6 Lectures)**

Generators and Transformers: DC Power sources (basic idea). AC and DC generators (basic principle of action). Inductance, capacitance, and impedance. Operation of transformers (Step-up and step-down). **(4 Lectures)**

PHY-H-GE-T-03: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)
Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

(6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray

Dumkal College, Basantapur Murshidal

emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

(8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions).

(3 Lectures)

Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. (4 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-08: MATHEMATICAL PHYSICS-III

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula. Simply and multiply connected region. Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. (30 Lectures)

Integrals Transforms:

Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (15 Lectures) Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (15 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. (3 Lectures)



Solar energy: Solar energy, It's importance, storage of solar energy (Thermal storage and Electrical storage, Mechanical storage), solar pond (Basic idea), Principle of operation of non convective solar pond, applications of solar pond, solar water heating, flat plate collector, solar cooker (basic idea, Design principle and Constructional details of box type solar cooker and its limitation), solar furnace, solar green houses (basic idea, types and advantage), Solar Cell principle (No mathematical treatment), application of solar photovoltaic system, advantage and disadvantage of Photovoltaic solar energy conversion. **(6 Lectures)**

PHY-H-GE-T-04: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of



Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. **(8 Lectures) Dielectric Properties of Materials:** Polarization. Local Electric Field at an Atom. Depolarization

Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

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<mark>Semester V</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

Radioactivity decay:(a) Alpha decay: basics of α -decay processes, theory of a-emission, Gamow factor, Geiger Nuttall law, α -decay spectroscopy. (b) (β - decay: energy kinematics for (β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. **(5 Lectures)**

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

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Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. **(5 Lectures)**

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. **(14 Lectures)**

PHY-H-DSE-T-01: CLASSICAL DYNAMICS

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. Hamilton's equations of motion. Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. Poisson brackets. Canonical transformations.

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<mark>Semester V</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-DSE-T-01: ELECTRICITY AND MAGNETISM

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). **(12 Lectures)**

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. **(6 Lectures)**

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Semester VI

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-DSE-T-03: NANO MATERIALS AND APPLICATIONS

NANOSCALE SYSTEMS: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of



SSA.

Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences. (12 Lectures)

SYNTHESIS OF NANOSTRUCTURE MATERIALS: Top down and Bottom up approach, Photolithography. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, Ebeam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spraypyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. (10 Lectures)

CHARACTERIZATION: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Transmission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy. (10 Lectures)

OPTICAL PROPERTIES: Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasi-particles and excitons, charging effects. Radiative processes: General formalizationabsorption, emission and luminescence. Optical properties of heterostructures and nanostructures. (16 Lectures)

ELECTRON TRANSPORT: Carrier transport in nanostrutures. Coulomb blockade effect, thermionic emission, tunneling and hoping conductivity. Defects and impurities: Deep level and surface defects. **(9 Lectures)**

APPLICATIONS: Applications of nanoparticles, quantum dots, nano wires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors.

Nanomaterial Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS). **(18 Lectures)**

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<mark>Semester VI</mark>

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-DSE-T-02: NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

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<mark>Semester I</mark>

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 **Lectures**) Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts. (6 Lectures) Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power

dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems. (4 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME:SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only). First Order Differential Equations and Integrating Factor.

Second Order Differential equations: Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

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PHY-H-CC-T-02: MECHANICS

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3Lectures) Motion of a particle under a central force field: Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effectson astronauts. (6 Lectures) Oscillations: SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution.

Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (7 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems.

PHY-H-GE-T-01: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures)
Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures)
Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures)

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Semester II

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Magnetic Properties of Matter:

Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. B-H curve and hysteresis. (3 Lectures)

Electromagnetic Induction:

Faraday's Law. Lenz's Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. **(5 Lectures)**

Transients: Growth and decay of currents and voltages in L-R, C-R and L-C-R circuits; electrical oscillations in L-C circuits. (2 Lectures)

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Electrical Circuits: AC Circuits: Kirchhoff s laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. **(4 Lectures)**

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits. **(4 Lectures)**

Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. **(3 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's

Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 Lectures)

PHY-H-GE-T-02: WAVES AND OPTICS

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis.

(14 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light - production and analysis. Circular and elliptical polarization. (5 Lectures)

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.



(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier.

(10 Lectures)

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Semester III

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-07: DIGITAL SYSTEMS AND APPLICATIONS

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. **(3 Lectures)**

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (3 Lectures)

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. **(6 Lectures)**

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (6 Lectures)

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.(4 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (5 Lectures)

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop. (6 Lectures) Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters(4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Computer Organization: Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (6 Lectures) Intel 8085 Microprocessor Architecture: Main features of 8085. Block diagram. Components. Pinout diagram. Buses. Registers. ALU. Memory. Stack memory. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. (8 Lectures)

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Introduction to Assembly Language: 1 byte, 2 byte & 3 byte instructions. (4 Lectures)

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources (principle of generation, output wave form, advantage of using three-phase). Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. **(8Lectures)**

Electric Motors: Single-phase, three-phase & DC motors. Basic design. Speed & power of ac motor. **(3 Lectures**

PHY-H-GE-T-03: MECHANICS

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (6 Lectures)
Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (8 Lectures)
Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures)

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**



Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

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Semester IV

FACULTY NAME: SIRAJUL SK, DUMKAL COLLEGE

PHY-H-CC-T-10: ANALOG SYSTEMS AND APPLICATIONS

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram.

Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (10 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Halfwave Rectifiers. Centretapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. **(6 Lectures)**

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β , Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

(6 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. **(10 Lectures)**

Coupled Amplifier: RC-coupled amplifier and its frequency response. **(4 Lectures) Feedback in Amplifiers:** Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. **(4 Lectures)**

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (4 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3)Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (9 Lectures)

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Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation) **(3 Lectures)**

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

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3rd Year

FACULTY NAME:SIRAJUL SK, DUMKAL COLLEGE

QUANTUM MECHANICS AND APPLICATIONS

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum and Energy operators; commutator of position and momentum operators; Hermitian Operators, Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states. (5 Lectures)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method; Hermite polynomials; ground state, zero point energy & uncertainty principle. **(10 Lectures)**

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for second order partial differential equation; angular momentum operator & quantum numbers; Radial wavefunctions from Frobenius method; shapes of the probability densities for ground & first excited states; Orbital angular momentum quantum numbers 1 and m; s, p, d,..shells. (11 Lectures)

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Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. (11 Lectures)

Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (5 Lectures)

Many electron atoms: Pauli's Exclusion Principle. Symmetric & Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total angular momentum. Vector Model. Spin-orbit coupling in atoms- L-S and J-J couplings. Hund's Rule. Term symbols. Spectra of Hydrogen and Alkali Atoms (Na etc.). **(10 Lectures**

ELECTROMAGNETIC THEORY

Maxwell Equations: Review of Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density. (12 Lectures) EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (10 Lectures)

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal incidence) (10 Lectures)

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light. (**12 Lectures**)

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (5 Lectures)

Wave Guides: Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission. **(8 Lectures)**

Optical Fibres:- Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). **(3 Lectures)**

ANALOG SYSTEMS AND APPLICATIONS

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Head of the Department Dept of Physics Dumkal College, Nurshidabad

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram.

Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (10 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Halfwave Rectifiers. Centretapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. (6 Lectures)

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC 21

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<mark>Semester I</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Orthogonal Curvilinear Coordinates:

Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. (4 Lectures)

Matrices: Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix. Hermitian and Skew- Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Eigen-values and Eigenvectors (Degenerate and nondegenerate). Cayley-Hamiliton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary homogeneous Differential Equations. Functions of a Matrix. (6 Lectures) Introduction to probability:

Independent random variables: Sample space and Probability distribution functions. Binomial, Gaussian, and Poisson distribution with examples. Mean and variance. (5 Lectures)

Dirac Delta function and its properties: (2)

Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function.

PHY-H-CC-T-02: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. **Rotational Dynamics:** Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **Fluid Motion**: Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. Euler's Equation. Bernoulli's Theorem.



PHY-H-GE-T-01: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (5 Lectures)

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder -Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia -q, r j and o by Searles method. (8 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2019-2020 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics. (8 Lectures)

Magnetic Field:

Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. (9 Lectures)

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and equal frequency differences. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

(4 Lectures)

Principal Dumkal College, Basantapur Murshidahad W B.

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.**(6 Lectures)**

PHY-H-GE-T-02: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2019-2020 SYLLABUS DISTRIBUTION

Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-06: THERMAL PHYSICS

Introduction to Thermodynamics

Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroeth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law & various processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient. (8 Lectures)

Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale.

(10 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature-Entropy diagrams for Carnot's Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (7 Lectures)

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature.

Principal Dumkal College, Basantapur Murshidahad W B.

Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations. (7 Lectures) Maxwell's Thermodynamic Relations: Derivations and applications of Maxwell's Relations, Maxwell's Relations:(1) Clausius Clapeyron equation, (2) Values of Cp- Cv, (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (7 Lectures) Kinetic Theory of Gases Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (7 Lectures) Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance. (4 Lectures) **Real Gases:** Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. p-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion.

Joule- Thomson Cooling. (10 Lectures)

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers (half wave and full wave rectifier with L, C, L-C filter arrangement, regulation). Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources. (4 Lectures)

Electrical Protection: Relays, Fuses and disconnect switches, Working principle of Circuit breakers, Miniature circuit breaker and its types. **(3 Lectures)**

Electrical Wiring: Conduit wiring (basic idea of house hold wiring). Basics of wiring: Star and Delta Connections. Preparation of extension board, Wiring Materials (Basic information about the wiring components). **(2 Lectures)**

PHY-H-GE-T-03: MECHANICS

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. **(5 Lectures)**

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of



Rigidity modulus and moment of inertia -q, r j and o by Searles method. (8 Lectures)

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-H-CC-T-09: ELEMENTS OF MODERN PHYSICS

Planck's quantum hypothesis, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson- Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**

Position measurement- gamma ray microscope thought experiment; Waveparticle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction. **(5 Lectures)**

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(10 Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. **(10 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers. (6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. (8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). **(3 Lectures)** Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions.

Optical Pumping and Population Inversion. Three- Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. (4 Lectures)

Dumkal College, Basantapur

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Hydro Energy: Hydropower resources, Types of hydroelectric project (Run-of-river schemes, Storage schemes, Pumped-Storage schemes, Low head power plant, Medium head power plant, High head power station), environmental impact of hydro power sources. **(4 Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect (No mathematical treatment), materials used for piezoelectricity, recent application of piezoelectric generators. (5 Lectures)

Electromagnetic Energy Harvesting: Linear generators (principle of linear generator, applications). (2 Lecture)

PHY-H-GE-T-04: WAVES AND OPTICS

Superposition of Two Collinear Harmonic oscillations: Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). (4 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (7 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (GENERAL) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

<mark>Semester I</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Collisions: Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames. (3 Lectures)

Rotational Dynamics: Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (12 Lectures)

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. **(3 Lectures) Fluid Motion:** Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube. (2 **Lectures)**

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Principal Dumkal College, Basantapur Murshidabad, W.B.

<mark>Semester II</mark>

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies

(Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.

(5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses.

(2 Lectures)

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves.

(4 Lectures)

Velocity of Waves: Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction. **(6 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

Semester III

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Planck's quantum, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions. **(14 Lectures)**

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables): Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction.

(5 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2019-20

Principal Dumkal College, Basantapur Murshidah

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Semester IV

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

(12 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T₃ law (10 Lectures)

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2019-20

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3rd Year

FACULTY NAME: SURAJIT SAHA, DUMKAL COLLEGE

STATISTICAL MECHANICS

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) - Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature. **(18 Lectures)**

Classical Theory of Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff s law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Saha's Ionization Formula. Rayleigh-Jean's Law. Ultraviolet Catastrophe. (9 Lectures)

Quantum Theory of Radiation: Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law. **(5 Lectures)**

Bose-Einstein Statistics: B-E distribution law, Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law. (13 Lectures)

Fermi-Dirac Statistics: Fermi-Dirac Distribution Law, Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals, Relativistic Fermi gas, White Dwarf Stars, Chandrasekhar Mass Limit. **(15 Lectures)**

Principal Dumkal College, Basantapur Murshidahad W B.

SOLID STATE PHYSICS

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis - Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. **(12 Lectures)**

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids, T₃ law. (10 Lectures) Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains.

Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

Ferroelectric Properties of Materials: Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop. **(6 lectures)**

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient. **(10 Lectures)**

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation) **(6 Lectures)**

ELECTROMAGNETIC THEORY

Maxwell Equations: Review of Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density. (**12 Lectures**)

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (10 Lectures)

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal incidence) (10 Lectures)

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation

Principal Dumkal College, Basantapur Murshidahad W B.

Head of the Department Dept of Physics Dumkal College, Nurshidabad

Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light. (12 Lectures)

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (5 Lectures)

Wave Guides: Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission. **(8 Lectures)**

Optical Fibres:- Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). **(3 Lectures)**

Principal

Principal Dumkal College, Basantapur Murshidabad, W.B.

SSA

Configurations. Current gains α and β , Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

(6 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. **(10 Lectures)**

Coupled Amplifier: RC-coupled amplifier and its frequency response. **(4 Lectures) Feedback in Amplifiers:** Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. **(4 Lectures)**

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (4 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3)Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (9 Lectures)

Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation) **(3 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-01: MATHEMATICAL PHYSICS-I

Vector Calculus:

Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields.

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. **Vector Integration**: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of

infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proof)

PHY-H-CC-T-02: MECHANICS

Principal Dumkal College, Basantapur Murshidahad W B.

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket.

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy.

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Four Vectors (definition and examples only).

PHY-H-GE-T-01: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. **(4 Lectures)**

Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. **(10 Lectures)**

Momentum and Energy: Conservation of momentum. Work and energy.

Conservation of energy. Motion of rockets. (6 Lectures)

Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities.(7 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (GENERAL) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

Semester I

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-01: MECHANICS

Fundamentals of Dynamics: Reference frames. Inertial frames; Galilean transformations; Galilean invariance. Review of Newton's Laws of Motion. Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse. Momentum of variable-mass system: motion of rocket. **(6 Lectures)**

Work and Energy: Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Potential Energy. Energy diagram. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non-conservative forces. Law of conservation of Energy. **(4 Lectures)**

Principal Dumkal College, Basantapur Murshidahad W B.

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. **(10 Lectures)**

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHÝSICS (HONOURS) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-03: ELECTRICITY AND MAGNETISM

Electric Field and Electric Potential:

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. **(6 Lectures)**

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.(6 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. **(10 Lectures)**

PHY-H-CC-T-04: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal

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thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer.

PHY-H-GE-T-02: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

CBCS CURRICULUM FOR SEMESTERIZED UNDER-GRADUATE COURSE IN PHYSICS (GENERAL) THE ACADEMIC SESSION 2019-20 SYLLABUS DISTRIBUTION

Semester II

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-02: WAVES AND OPTICS

Superposition of Two Harmonic Waves:

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves. (7 Lectures)



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Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. **(4 Lectures)**

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-05: MATHEMATICAL PHYSICS-II

Fourier Series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier Series. Parseval Identity. (14 Lectures) Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Bessel Functions of the First Kind: Generating Function, simple recurrence relations. Zeros of Bessel Functions and Orthogonality. (24 Lectures) Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (4 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Wave equation and its solution for vibrational modes of a stretched string, rectangular and circular membranes. **(14 Lectures)**

Skill Enhancement Courses (Credit: 02 each) PHY—H-SEC-T-01: ELECTRICAL CIRCUITS & NETWORK SKILLS

Principal Dumkal College, Basantapur Murshidal

Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law, Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with digital multimeter (name of the circuit elements and their ranges), Analog voltmeter and analog ammeter. **(6 Lectures)**

Generators and Transformers: DC Power sources (basic idea). AC and DC generators (basic principle of action). Inductance, capacitance, and impedance. Operation of transformers (Step-up and step-down). **(4 Lectures)**

PHY-H-GE-T-03: MECHANICS

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (4 Lectures)
Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. (10 Lectures)
Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (6 Lectures)
Speed Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities

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Semester III

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-03: ELEMENTS OF MODERN PHYSICS

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

(6 Lectures)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

(8 Lectures)

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions).

(3 Lectures)

Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. (4 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-H-CC-T-08: MATHEMATICAL PHYSICS-III

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula. Simply and multiply connected region. Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. (**30 Lectures**)

Integrals Transforms:

Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (15 Lectures) Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (15 Lectures)

PHY—H-SEC-T-02: RENEWABLE ENERGY AND ENERGY HARVESTING

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. (3 Lectures)

Solar energy: Solar energy, It's importance, storage of solar energy (Thermal storage and Electrical storage, Mechanical storage), solar pond (Basic idea), Principle of operation of non-convective solar pond, applications of solar pond, solar water heating, flat plate collector, solar cooker (basic idea, Design principle and Constructional details of box type solar cooker and its limitation), solar furnace, solar greenhouses (basic idea, types and advantage), Solar Cell principle (No mathematical treatment), application of solar photovoltaic system, advantage and disadvantage of Photovoltaic solar energy conversion. **(6 Lectures)**

PHY-H-GE-T-04: WAVES AND OPTICS

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to



spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegar's method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem -Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels -Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (3 Lectures)

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

(10 Lectures)

Michelson's Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (3 Lectures)

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Semester IV

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

PHY-G-CC-T-04: SOLID STATE PHYSICS

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. **(8 Lectures)**

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes. (8 Lectures)

UNDER-GRADUATE COURSE IN PHYSICS (HONOURS) THE ACADEMIC SESSION 2019-20

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SYLLABUS DISTRIBUTION

3rd Year

FACULTY NAME: MASADULHASSAN, DUMKAL COLLEGE

CLASSICAL MECHANICS

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. Hamilton's equations of motion. Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. Poisson brackets. Canonical transformations. **(22 Lectures)**

PHYSICAL OPTICS

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. (3 Lectures)

Interference: Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index. (9 Lectures)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. **(4 Lectures)**

Diffraction: Kirchhoff s Integral Theorem, Fresnel-Kirchhoff s Integral formula and its application to rectangular slit. **(5 Lectures)**

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. **(8 Lectures)**

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (7 **Lectures)**

NUCLEAR AND PARTICLE PHYSICS

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states. (10 Lectures)

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell



structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. (12 Lectures)

Radioactivity decay:(a) Alpha decay: basics of α -decay processes, theory of a-emission, Gamow factor, Geiger Nuttall law, α -decay spectroscopy. (b) (β - decay: energy kinematics for (β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. (9 Lectures)

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(8 Lectures)**

Nuclear Astrophysics: Early universe, primordial nucleosynthesis (particle nuclear interactions), stellar nucleosynthesis, concept of gamow window, heavy element production: r- and s- process path. **(5 Lectures)**

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe-Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. (6 Lectures)

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector. **(6 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. (5 Lectures)

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. **(14 Lectures)**

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Head of the Department Dept of Physics Dumkal College, Nurshidabad

DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SESSION: 2018-2019, PART-II

S.L	TEACHER	GROUP	MARS	СНА	SYLLABUS	CLASS
NO.	NAME			PTER		
		(A)		1	Management of sports and games in School, college and University	2
		Management of physical		2	Types of tournament- (a) knock-out system (b) league system (c) combination system	2
		education & sports	30	3	Lay-out of play-fields and basic rules (a) Kabaddi, (b)Kho-Kho, (c) Volleyball, (d) Badminton, (e)Football, (f)Hockey, (g) Cricket, (h) Track and Field event.	3
				4	Care and maintenance of sports equipment.	1
1.	MD YUSUF			5	Meaning and principles of sports training, Conditioning, Warming-up and Cooling-down.	1
				6	Components of physical fitness, speed, strength, endurance, agility and flexibility. Health related physical fitness and performance related physical fitness.	2
		(B) Principles of physical		7	Load and adaptation, load fctors, over load-couses and remedies.	2
		education	20	8	Training methods, circuit training, interval, fartek, cross-country, weight training.	2
				9	Mechanical principles applied to sports. Motion-types and laws of motion, anatomical leaver and its types, equilibrium-its types and factors, centre of gravity, fource and its types-centrifugal, centripetal, friection and water resistance.	1
				1	Kabaddi, Kho-Kho, Football, Track and Field event.	2
		Practical	50	2	Gymnastics, Yoga	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SESSION: 2018-2019, PART-II

S.L	TEACHER	GROUP	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		(0)		10	Meaning of Health education	1
		(C) Health education	20	11	Major area of Health Education. Health service-daily health inspection and follow up, health records, clinic and health center. Healthful environment-healthful environment in educational institutions, offices, factories, play ground, auditorium etc.Environmental Hygiene-lighting, ventilation, water supply, waste- disposal.	3
			50	12	Environmental pollution-air, water, soil pollution-causes and control.	2
2.	MUHAMMAD			13	Mental health-problems of maladjustment, minor menial disorders- their causes and precautions.	1
	ALI SK			14	Safety education-safety at Home, School, College, Play ground, Streets.	2
				15	Prevention and control of Communicable dieses-Malaria, Cholera, Common Cold, Influenza	2
				16	First Aid- Sprain, muscle pull, dislocation, fracture, cramps, shock, wonds and bleeding, snake bites, drowning, electric shock, burns and artificial respiration.	2
		(D)		17	Muscular system, various types of muscles, structure of muscle, effects of Exercises on muscle, muscular contraction, Ecentric concentric static, isometric, isotonic, isokinetic exercises, motor unit.	2
				18	Effect of Exercises on circulatory system, blood pressure.	1
		Exercise physiolog	20	19	Effect on Exercises on respiratory system, vital-capacity, oxygen debt.	2
		У	У	20	Cardiovascular endurance, fatigue, muscular endurance.	2
				1	Volleyball, Hockey, Cricket, Badminton	3
		Practical	50	2	First Aid, Practical Not Book.	2

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SESSION: 2018-2019, PART-III

S.L NO.	TEACHER NAME	GROUP	MARKS	CHA PTER	SYLLABUS	CLASS
		(A) Therapeutic aspects of physical activities		1	Osteoporosis- cause, symptom Treatment, Obesity and its control by sports and physical education, cardiovascular disease and its control coronary artery disease, Hypertension, stroke, congestive Heart failure, Diabetes.	2
			30	2	Defination of corrective. Different types of sports injury with treatment- Muscles injury, sprain, bones fracture and dislocation. Waist injury. Massage and different methods of massage- principle of massage, rubbing method, kneading, vibrate method. Massage effects the muscle and circulatory system of blood. Important of exercise in daily life. Isokeinetic exercise.	2
				3	Physiotherapy and different methods of physiotherapy-principles of physiotherapy, importance of physiotherapy, different methods of physiotherapy- Electrotherapy, Hydrotherapy, Cryotherapy, Thermotherapy. Difference between physiotherapy and exercise therapy.	2
1.				4	Rehabilitation and its basic principles. Rehabilitation modalities. Relaxation technique.	2
	ALI			1	Barometer ability test- standing broad jump, zigzag run, medicine bull pass.	2
		(A)		2	A) Administration of fitness testing procedure- medicine bull put, standing broad jump, pull up. B) Measurement of endurance test- i)Measurement of muscular endurance(Knees bent sit-up) ii) Cardiorespiratory endurance(Cooper test) iii) Cardio vascular efficiency(Harvard step test), C) Speed Measurement test.	2 2 2 2 2 3
		Practical	20	3	Athletic (running, jumping, throwing), kho-kho, volleyball, football, cricket, basketball, hockey, badminton, kabaddi.	3

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SESSION: 2018-2019, PART-III

S.L	TEACHER	GROUP	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
	MUHAMMAD ALI SAIKH	(B)	30	5	Modern concept of health and wellness, modern concept of physical fitness, Component of physical fitness, Role of health and physical fitness in the modern society, life style, healthy life style and physical activities, active life style.	3
2.		JHAMMAD I SAIKH Physical activities and life style (A) Practical		6	Growth and development, Difference between growth and development, Characteristic of development process, Physical activity and characteristics of growth and development in infancy stage, Physical activities and characteristics of growth and development in childhood stage.	2
				7	Characteristics of adolescent stage and some physical activities, Write different physical activities for pregnant mother, Physical activities for house wife, Social containts on women participation in sports and games of athletics.	3
				8	Ageing effects and physical activities, Physical activities for aged, Risks of exercise among aged.	1
				9	Disabled and their physical activities- Disabled, Physical disabled, Mantel disabled, Social disabled, Emotional disabled, Juvenile delinquency.	2
				4	Corrective exercise for knee injury, Corrective exercise for shoulder injury, Corrective exercise for hip injury, Corrective exercise for ankle injury, Corrective exercise for trunk injury.	3
			20	5	N.C.C, Blood donation camp, Scouts and guides, Bratachary, Adventure sports, N.S.S.	2
				6	Visit to a higher level tournament and record book .	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1, (July-dec.) Corse Code- CC1A, SESSION: 2018-2019,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L NO.	TEACHER NAME	UNIT	MARKS	CHA PTER	SYLLABUS	CLASS
		Corse Code-		1.1	Meaning and definition of Physical Education.	1
				1.2	Aim and objectives of Physical Education.	1
		Introduction	10	1.3	Modern concept of Physical Education.	1
				1.4	Importance of Physical Education.	1
1						
1.	ALI	Unit- II: Biological and Sociological	10	2.1	Biological Foundation- Meaning and definition of growth and development. Factors affecting growth and development. Differences of growth and development. Principles of growth and development.	3
		of Physical		2.2	Age- Chronological age, anatomical age, physiological age and mental age.	3
		Education		2.3	Sociological Foundation- Meaning and definition of Sociology, Society and Socialization.	2
				2.4	Role of games and sports in National and International integration.	2
				1	Learn and demonstrate the technique of Suryanamaskar.	3
		Practical	20	2	Development of physical fitness through Callisthenics and Aerobic activities.	3

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1 (July-dec.), Corse Code- CC1A, SESSION: 2018-2019,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER	UNIT	MARKS	СНА	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- III: History of		3.1	Historical development of Physical Education and Sports in India- Pre-Independence period and Post-Independence period.	2
		Physical Education	10	3.2	Olympic Movement- Ancient Olympic Games and Modern Olympic Games.	2
				3.3	Brief historical background of Asian Games and Commonwealth Games.	2
				3.4	National Sports Awards- Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award	2
2.	MUHAMMAD ALI SAIKH					
		Unit- IV: Yoga	10	4.1	Meaning and definition of the term Yoga, types, aim, objectives and important of Yoga.	2
		Education	10	4.2	History of Yoga.	3
				4.3	Astanga Yoga	2
				4.4	Hatha Yoga	2
		INTERNAL ASSESSMEN T	15	1	Internal assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

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SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2018-2019

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- II: Tournaments		2.1	Tournaments: Meaning and definition and types of tournaments (Knock-out, League, Combination, Challenge).	3
			10	2.2	Procedure of drawing fixture.	3
			10	2.3	Method of organising Annual Athletic Meet and Play Day.	2
				2.4	Method of organising of Intramural and Extramural competition.	2
1.	MD YUSUF					
	ALI	Unit- IV:		4.2	Meaning and definition of leadership.	1
		Leadership	10	4.3	Principles of leadership activities.	2
				4.4	Qualities of good leader in Physical Education.	1
				4.2	Hierarchy of Leadership in School, College and University level.	2
		Practica		1	Track and Field events (any one).	3
		Lay out knowledge and Officiating ability-	20	2	Games: Football, Kabaddi, Kho-Kho and Volleyball (any one).	4

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DEPARTMENT OF PHYSICAL EDUCATION

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SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2018-2019

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- I:		1.1	Concept and definition of Sports Management.	2
		Introduction		1.2	Important of Sports Management.	2
			10	1.3	Purpose of Sports Management.	2
				1.4	Principles of Sports Management.	1
2						
Ζ.	AD ALI	Unit- III:		3.1	Method of calculation of Standard Athletic Track marking.	3
	SAIKH	Equipment	10	3.2	Care and maintenance of play Ground and gymnasium.	2
				3.3	Importance, care and maintenance of sports Equipment.	2
				3.4	Time Table: Meaning, importance and factors affecting school's physical education Time Table.	2
		INTERNAL ASSESSMENT	15	1	Internal assessment & class attendance	2
l		1	1	1		1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SESSION: 2019-2020, PART-III

S.L NO.	TEACHER NAME	GROUP	MARKS	CHA PTER	SYLLABUS	CLASS
1.		(A)	30	1	Osteoporosis- cause, symptom Treatment, Obesity and its control by sports and physical education, cardiovascular disease and its control coronary artery disease, Hypertension, stroke, congestive Heart failure, Diabetes.	2
	MD YUSUF	Therapeutic aspects of physical activities		2	Defination of corrective. Different types of sports injury with treatment- Muscles injury, sprain, bones fracture and dislocation. Waist injury. Massage and different methods of massage-principle of massage, rubbing method, kneading, vibrate method. Massage effects the muscle and circulatory system of blood. Important of exercise in daily life. Isokeinetic exercise.	3
	ALI			3	Physiotherapy and different methods of physiotherapy-principles of physiotherapy, importance of physiotherapy, different methods of physiotherapy- Electrotherapy, Hydrotherapy, Cryotherapy, Thermotherapy. Difference between physiotherapy and exercise therapy.	3
				4	Rehabilitation and its basic principles. Rehabilitation modalities. Relaxation technique.	2
				1	Barometer ability test- standing broad jump, zigzag run, medicine bull pass.	2
		(A) Practical	20	2	A) Administration of fitness testing procedure- medicine bull put, standing broad jump, pull up. B) Measurement of endurance test- i)Measurement of muscular endurance(Knees bent sit-up) ii) Cardiorespiratory endurance(Cooper test) iii) Cardio vascular efficiency(Harvard step test), C) Speed Measurement test.	3
				3	Athletic (running, jumping, throwing), kho-kho, volleyball, football, cricket, basketball, hockey, badminton, kabaddi.	3

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SESSION: 2019-2020, PART-III

S.L	TEACHER	GROUP	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		(B)		5	Modern concept of health and wellness, modern concept of physical fitness, Component of physical fitness, Role of health and physical fitness in the modern society, life style, healthy life style and physical activities, active life style.	3
		Physical activities and life style	30	6	Growth and development, Difference between growth and development, Characteristic of development process, Physical activity and characteristics of growth and development in infancy stage, Physical activities and characteristics of growth and development in childhood stage.	3
				7	Characteristics of adolescent stage and some physical activities, Write different physical activities for pregnant mother, Physical activities for house wife, Social containts on women participation in sports and games of athletics.	2
				8	Ageing effects and physical activities, Physical activities for aged, Risks of exercise among aged.	2
2.	MUHAMMAD ALI SAIKH			9	Disabled and their physical activities- Disabled, Physical disabled, Mantel disabled, Social disabled, Emotional disabled, Juvenile delinquency.	2
		(A)	20	4	Corrective exercise for knee injury, Corrective exercise for shoulder injury, Corrective exercise for hip injury, Corrective exercise for ankle injury, Corrective exercise for trunk injury.	3
		Practical		5	N.C.C, Blood donation camp, Scouts and guides, Bratachary, Adventure sports, N.S.S.	2
				6	Visit to a higher level tournament and record book .	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1 (July-dec.) Corse Code- CC1A, SESSION: 2019-2020,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Corse Code- CC1A		1.1	Meaning and definition of Physical Education.	2
		Unit- I		1.2	Aim and objectives of Physical Education.	L
		Introduction	10	1.3	Modern concept of Physical Education.	1
				1.4	Importance of Physical Education.	2
1						
1.	ALI	Unit- II: Biological and Sociological	10	2.1	Biological Foundation- Meaning and definition of growth and development. Factors affecting growth and development. Differences of growth and development. Principles of growth and development.	3
		of Physical Education		2.2	Age- Chronological age, anatomical age, physiological age and mental age.	3
				2.3	Sociological Foundation- Meaning and definition of Sociology, Society and Socialization.	2
				2.4	Role of games and sports in National and International integration.	2
				1	Learn and demonstrate the technique of Suryanamaskar.	2
		Practical	20	2	Development of physical fitness through Callisthenics and Aerobic activities.	2

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1 (July-dec.), Corse Code- CC1A, SESSION: 2019-2020,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- III: History of		3.1	Historical development of Physical Education and Sports in India- Pre-Independence period and Post-Independence period.	3
		Physical Education	10	3.2	Olympic Movement- Ancient Olympic Games and Modern Olympic Games.	3
				3.3	Brief historical background of Asian Games and Commonwealth Games.	2
_				3.4	National Sports Awards- Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award	2
2.	ALI SAIKH					
		Unit- IV: Yoga	10	4.1	Meaning and definition of the term Yoga, types, aim, objectives and important of Yoga.	3
		Education	10	4.2	History of Yoga.	2
				4.3	Astanga Yoga	2
				4.4	Hatha Yoga	2
		INTERNAL ASSESSMEN T	15	1	Internal Assessment & class attendance	1

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2019-2020,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- I: Introduction		1.1	Meaning and definition of Anatomy, Physiology and Exercise Physiology.	3
			10	1.2	Importance of Anatomy, Physiology and Exercise Physiology in Physical Education.	2
				1.3	Human Cell- Structure and function.	2
				1.4	Tissue- Types and functions.	2
1.	MD YUSUF					
	ALI	Unit- II: Musculo- skeletal	10	2.1	Skeletal System- Structure of Skeletal System. Classification and location of bones and joints. Anatomical differences between male and female.	3
		System		2.2	Muscular System- Type, location, function and structure of muscle.	3
				2.3	Types of muscular contraction.	2
				2.4	Effect of exercise on muscular system.	2
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1
		SEC1: UNIT-2: Field events	20	2.1	Long Jump: Approach Run, Take-off, Flight in the air (Hang Style/Hitch Kick) and Landing.	3
				2.2	High jump: Approach Run, Take-off, Bar Clearance (Straddle) and Landing.	4
				2.3	Shot put: Holding the Shot, Placement, Initial Stance, Glide, Delivery Stance and Recovery (Perry O'Brien Technique).	4
				2.4	Discus Throw: Holding the Discus, Initial Stance, Primary Swing, Turn, Release and Recovery (Rotation in the circle).	4
				2.5	Javelin Throw: Grip, Carry, Release and Recovery (3/5 Impulse stride).	3
		SEC1: INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2019-2020,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- III:		1.1	Blood- Composition and function.	3
		System		1.2	Heart- Structure and functions. Mechanism of blood circulation through heart.	3
			10	1.3	Blood Pressure, Athletic Heart and Bradycardia.	2
				1.4	Effect of exercise on circulatory system.	2
2.	МИНАММ					
	AD ALI	Unit- IV: Bosniratory		2.1	Structure and function of Respiratory organs.	2
	SAIKH	System	10	2.2	Mechanism of Respiration.	2
				2.3	Vital Capacity, O2 Debt and Second Wind.	3
				2.4	Effect of exercise on respiratory system.	2
				1	Assessments of BMI and WHR.	1
		CC: Practical	20	2	Assessment of Heart rate, Blood Pressure, Respiratory Rate, and Pick Flow Rate	3
				1.1	Starting Techniques: Standing start and Crouch start (its variations) use of Block.	3
		SEC1: UNIT-1:	20	1.2	Acceleration with proper running techniques.	3
		TRACK EVENTS		1.3	Finishing technique: Run Through, Forward Lunging and Shoulder Shrug.	4
				1.4	Relay Race: Starting, Baton Holding/Carrying, Baton Exchange in between zone, and Finishing	3

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2019-2020,

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- II: Tournaments		2.1	Tournaments: Meaning and definition and types of tournaments (Knock-out, League, Combination, Challenge).	4
			10	2.2	Procedure of drawing fixture.	3
			10	2.3	Method of organising Annual Athletic Meet and Play Day.	3
				2.4	Method of organising of Intramural and Extramural competition.	3
1.	MD YUSUF					
	ALI	Unit- IV:		4.2	Meaning and definition of leadership.	2
		Leadership	10	4.3	Principles of leadership activities.	3
				4.4	Qualities of good leader in Physical Education.	3
				4.2	Hierarchy of Leadership in School, College and University level.	3
		Practica		1	Track and Field events (any one).	3
		Lay out knowledge and Officiating ability-	20	2	Games: Football, Kabaddi, Kho-Kho and Volleyball (any one).	4

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SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2019-2020,

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit-I:		1.1	Concept and definition of Sports Management.	2
	introduction		1.2	Important of Sports Management.	2	
			10	1.3	Purpose of Sports Management.	2
				1.4	Principles of Sports Management.	3
2						
2.	AD ALI	Unit- III:		3.1	Method of calculation of Standard Athletic Track marking.	3
	SAIKH	Equipment	10	3.2	Care and maintenance of play ground and gymnasium.	3
				3.3	Importance, care and maintenance of sports Equipment.	2
				3.4	Time Table: Meaning, importance and factors affecting school's physical education Time Table.	3
		INTERNAL ASSESSMENT	15	1	Internal assessment & class attendance	1

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SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2019-2020,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L	TEACHER	UNIT	MARKS	CHA		SYLLABUS	CLASS
NO.	NAME			PTER			
		Unit- II: Health Problems in		2.1	Communicable Diarrhoea.	Diseases- Malaria, Dengue and Chicken Pox and	3
		and Control	10	2.2	Non-communic	able Diseases- Obesity, Diabetes and AIDS, Asthma.	2
				2.3	Nutrition- Nutri Health disorder	itional requirements for daily living. Balance Diet. 's due to deficiencies of Vitamins and Minerals.	3
				2.4	Postural deforr Lordosis, Scolic	nities- Causes and corrective exercise of Kyphosis, osis, Knock Knees and Flat Foot.	3
		Unit- IV: Health and First-aid	10	4.1	First aid- Mean aid.	ing, definition, importance and golden rules of First-	3
1.	1. MD YUSUF	wanagement		4.2	Concept of spo	rts injuries- Sprain, Strain, Facture and Dislocation.	3
A				4.3	Management o therapy and Th	f sports injuries through the application of Hydro- ermo- therapy.	3
				4.4	Management o and Massage th	f sports injuries through the application of Exercise nerapy.	3
		PRACTICAL	20	1.	First-aid Practic Cuff Sling), Roll Eight, Spica.	cal- Triangular Bandage: Slings (Arm Sling, Collar & er Bandages: Simple Spiral, Reverse Spiral, Figure of	2
				2.	Practical know	ledge on Hydro-therapy and Thermo-therapy.	2
		SEC2: UNIT-3 & 4: Asanas &	20	3.1	Standing Position	3.1.1 Ardhachandrasana,3.1.1 Brikshasana,3.1.1Achandrasana,3.1.1Padahastasana	1
		two)		3.2	Sitting Position	3.2.1Ardhakurmasana, 3.2.2 Paschimottanasana 3.2.3Gomukhasana	1
				3.3	Supine Position	3.3.1Setubandhasana, 3.3.2 Halasana, 3.3.3Matsyasana	1
				3.4	Prone Position	3.4.1 Bhujangasana, 3.4.2 Salvasana, 3.4.3 Dhanurasana	1
				3.5	Inverted Position	3.5.1 Sarbangasana, 3.5.2 Shirsasana, 3.5.3 Bhagrasana	1
				4	Pranayama	4.1 Kapalbhati, 4.2 Bhramri, 4.3 Anulam Vilom	1

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DEPARTMENT OF PHYSICAL EDUCATION

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SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2019-2020,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L	TEACHER	UNIT	MARKS	СНА	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- I: Introduction		1.1	Concept, definition and dimension of Health.	3
				1.2	Definition, aim, objectives and principles of Health Education.	2
			10	1.3	Health Agencies- World Health Organization (WHO), United Nations Educational Scientific and Cultural Organization (UNESCO).	3
				1.4	School Health Program- Health Service, Health Instruction, Health Supervision, Health appraisal and Health Record.	3
2. MUHAMM Unit- III: AD ALI Fitne: SAIKH	Unit- III: Physical Fitness and		3.1	Physical Fitness- Meaning, definition and Importance of Physical Fitness.	3	
	SAIKH	Weilness 10	10	3.2	Components of Physical Fitness- Health and Performance related Physical Fitness.	3
				3.3	Concept of Wellness. Relationship between Physical activities and Wellness.	2
				3.4	Ageing- Physical activities and its importance	2
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1
		SEC2: UNIT-1 & 2: GYMNASTICS	20	1	1.1 Forward Roll,1.1 T-Balance,1.1 Forward Roll with Split leg,1.1 Backward Roll,1.1 Cart-Wheel	2
				2	2.1 Dive and Forward Roll, 2.2 Hand Spring, 2.3 Head Spring, 2.4 Neck Spring, 2.5 Hand Stand and Forward Roll, 2.6 Summersault	2
		SEC1: INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1 (July-dec.) Corse Code- CC1A, SESSION: 2020-2021,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Corse Code-		1.1	Meaning and definition of Physical Education.	2
		Unit- I:		1.2	Aim and objectives of Physical Education.	2
		Introduction	10	1.3	Modern concept of Physical Education.	2
				1.4	Importance of Physical Education.	2
1.						
	ALI	Unit- II: Biological and Sociological	10	2.1	Biological Foundation- Meaning and definition of growth and development. Factors affecting growth and development. Differences of growth and development. Principles of growth and development.	4
		of Physical		2.2	Age- Chronological age, anatomical age, physiological age and mental age.	3
		Education		2.3	Sociological Foundation- Meaning and definition of Sociology, Society and Socialization.	2
				2.4	Role of games and sports in National and International integration.	2
				1	Learn and demonstrate the technique of Suryanamaskar.	2
		Practical	20	2	Development of physical fitness through Callisthenics and Aerobic activities.	3

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DEPARTMENT OF PHYSICAL EDUCATION

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SEMESTER-1 (July-dec.), Corse Code- CC1A, SESSION: 2020-2021,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- III: History of		3.1	Historical development of Physical Education and Sports in India- Pre-Independence period and Post-Independence period.	3
		Physical Education	10	3.2	Olympic Movement- Ancient Olympic Games and Modern Olympic Games.	3
			3.3	Brief historical background of Asian Games and Commonwealth Games.	2	
				3.4	National Sports Awards- Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award	3
2.	ALI SAIKH	Unit- IV: Yoga	10	4.1	Meaning and definition of the term Yoga, types, aim, objectives and important of Yoga.	3
		Education	10	4.2	History of Yoga.	2
				4.3	Astanga Yoga	2
				4.4	Hatha Yoga	2
		INTERNAL ASSESSMEN T	15	1	Internal Assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2020-2021,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- I: Introduction		1.1	Meaning and definition of Anatomy, Physiology and Exercise Physiology.	3
			10	1.2	Importance of Anatomy, Physiology and Exercise Physiology in Physical Education.	2
				1.3	Human Cell- Structure and function.	2
				1.4	Tissue- Types and functions.	3
1.	MD YUSUF ALI	Unit- II: Musculo- skeletal	10	2.1	Skeletal System- Structure of Skeletal System. Classification and location of bones and joints. Anatomical differences between male and female.	4
		System		2.2	Muscular System- Type, location, function and structure of muscle.	3
				2.3	Types of muscular contraction.	3
				2.4	Effect of exercise on muscular system.	3
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	3
		SEC1: UNIT-2: Field events	20	2.1	Long Jump: Approach Run, Take-off, Flight in the air (Hang Style/Hitch Kick) and Landing.	3
				2.2	High jump: Approach Run, Take-off, Bar Clearance (Straddle) and Landing.	3
				2.3	Shot put: Holding the Shot, Placement, Initial Stance, Glide, Delivery Stance and Recovery (Perry O'Brien Technique).	3
				2.4	Discus Throw: Holding the Discus, Initial Stance, Primary Swing, Turn, Release and Recovery (Rotation in the circle).	3
				2.5	Javelin Throw: Grip, Carry, Release and Recovery (3/5 Impulse stride).	3
		SEC1: INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2020-2021,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
3		Unit- III:		1.1	Blood- Composition and function.	2
		System		1.2	Heart- Structure and functions. Mechanism of blood circulation through heart.	3
			10	1.3	Blood Pressure, Athletic Heart and Bradycardia.	2
				1.4	Effect of exercise on circulatory system.	2
2.	MUHAMM					
	AD ALI	Unit- IV: Respiratory		2.1	Structure and function of Respiratory organs.	2
	SAIKH	System	10	2.2	Mechanism of Respiration.	2
				2.3	Vital Capacity, O2 Debt and Second Wind.	3
				2.4	Effect of exercise on respiratory system.	2
				1	Assessments of BMI and WHR.	2
		CC: Practical	20	2	Assessment of Heart rate, Blood Pressure, Respiratory Rate, and Pick Flow Rate	2
				1.1	Starting Techniques: Standing start and Crouch start (its variations) use of Block.	3
		SEC1: UNIT-1: Track Events	20	1.2	Acceleration with proper running techniques.	3
				1.3	Finishing technique: Run Through, Forward Lunging and Shoulder Shrug.	3
				1.4	Relay Race: Starting, Baton Holding/Carrying, Baton Exchange in between zone, and Finishing	3

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SEMESTER-5, (July-dec.) Corse Code- DSE 1A, & SEC3, SESSION: 2020-2021,

SUBJECT: Sports Training

SEC3: Indian Games and Racket Sports

S.L	TEACHER	UNIT	MARKS	СНА	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- II: Principle of		2.1	Warming up and Cooling down- Meaning, types and methods.	2
		Training and Conditioning		2.2	Conditioning- Concept of Conditioning and its principles.	3
			10			
				2.3	Training Methods- Circuit Training, Interval Training, Weight Training.	2
				2.4	Periodisation- Meaning, types, aim and contents of different periods.	2
		Unit- III: Training Load and		3.1	Training Load- Meaning, definition, types and factors of training load.	3
		Adaptation	10	3.2	Components of training load.	2
1				3.3	Over Load- Meaning, causes, symptoms and tackling of over load.	3
1.	ALI			3.4	Adaptation- Meaning and conditions of adaptation, Supercompensation.	2
		DSE: Practical	20	1.	Practical Experience of Weight Training and Circuit Training (any one).	2
				2.	Measurement of Speed, Strength (Grip/Leg), Explosive Strength (Leg) and Flexibility (any two).	3
		SEC3: Indian Games and Racket Sports.	20	1.	Skills in Raiding: Touching with hands, Use of leg-toe touch, squat leg thrust, side kick, mule kick, arrow fly kick, crossing of baulk line. Crossing of Bonus line.	3
		A. Fundamental		2.	Skills of holding the raider: Various formations, catching from particular position, different catches, catching formation and techniques.	3
		skills		3.	Additional skills in raiding: Escaping from various holds, techniques of escaping from chain formation, offense and defence.	3
				4.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretations and duties of the officials.	2
		KHO-KHO A. Fundamental		1.	Skills in Chasing: Sit on the box (Parallel & Bullet toe method), Get up from the box (Proximal & Distyal foot method), Give Kho (Simple, Early, Late & Judgment), Pole Turn, Pole Dive, Tapping, Hammering, Rectification of foul.	4
		SKIIIS		2.	Skills in running: Chain Play, Ring play and Chain & Ring mixed play.	2
				3.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretations and duties of the officials.	2

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DUMKAL COLLEGE

SEMESTER-5, (July-dec.) Corse Code- DSE 1A, & SEC3, SESSION: 2020-2021,

SUBJECT: Sports Training

SEC3: Indian Games and Racket Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- I:		2.1	Meaning and definition of Sports Training.	2
		Introduction		2.2	Aim and characteristics of Sports Training.	2
			10	2.3	Principles of Sports Training.	2
				2.4	Importance of Sports Training.	2
		Unit- IV: Training		3.1	Strength- Means and methods of strength development.	2
2.	MUHAMM	lechniques	10	3.2	Speed- Means and methods of speed development.	2
	AD ALI			3.3	Endurance- Means and methods of endurance development.	2
	SAIKH			3.4	Flexibility- Means and methods of flexibility development.	2
		INTERNAL	20	1	Internal Assessment & class attendance	1
		ASSESSMENT				
		SEC3: Indian Games and	20	1.	1. Basic Knowledge: Various parts of the Racket and Grip.	2
		Racket Sports.		2.	2. Service: Short service, Long service, Long-high service.	2
		BADMINTON		3.	3. Shots: Over head shot, Defensive clear shot, Attacking clear shot, Drop shot, Net shot, Smash.	3
		skills		4.	4. Game practice with application of Rules and Regulations.	2
				В.	B. Rules and their interpretations and duties of the officials.	3
		TABLE TENNIS		1.	 Basic Knowledge: Various parts of the Racket and Grip (Shake Hand & Pen Hold Grip). 	2
		A. Fundamental		2.	2. Stance: Alternate & Parallel.	2
		skills		3.	3. Push and Service: Backhand & Forehand.	2
				4.	4. Chop: Backhand & Forehand.	2
				5.	5. Receive: Push and Chop with both Backhand & Forehand.	2
				6.	6. Game practice with application of Rules and Regulations.	2
				В.	B. Rules and their interpretations and duties of the officials.	2
		INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2020-2021,

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
		Unit- II: Tournaments		2.1	Tournaments: Meaning and definition and types of tournaments (Knock-out, League, Combination, Challenge).	4
			10	2.2	Procedure of drawing fixture.	3
			10	2.3	Method of organising Annual Athletic Meet and Play Day.	3
				2.4	Method of organising of Intramural and Extramural competition.	3
1.	MD YUSUF					
	ALI	Unit- IV:		4.2	Meaning and definition of leadership.	2
		Leadership	10	4.3	Principles of leadership activities.	3
				4.4	Qualities of good leader in Physical Education.	3
				4.2	Hierarchy of Leadership in School, College and University level.	3
		Practica		1	Track and Field events (any one).	3
		Lay out knowledge and Officiating ability-	20	2	Games: Football, Kabaddi, Kho-Kho and Volleyball (any one).	4

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SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2020-2021,

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	CHA	SYLLABUS	CLASS
NO.	NAME			PTER		
	Unit-I:		1.1	Concept and definition of Sports Management.	2	
	miloduction		1.2	Important of Sports Management.	2	
			10	1.3	Purpose of Sports Management.	2
				1.4	Principles of Sports Management.	3
2						
2.	AD ALI	Unit- III: Facilities and Equipment	10	3.1	Method of calculation of Standard Athletic Track marking.	3
	SAIKH			3.2	Care and maintenance of play ground and gymnasium.	3
				3.3	Importance, care and maintenance of sports Equipment.	2
				3.4	Time Table: Meaning, importance and factors affecting school's physical education Time Table.	3
		INTERNAL ASSESSMENT	15	1	Internal assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2020-2021,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L	TEACHER	UNIT	MARKS	CHA		SYLLABUS	CLASS
NO.	NAME			PTER			
		Unit- II: Health Problems in India-		2.1	Communicable Diarrhoea.	e Diseases- Malaria, Dengue and Chicken Pox and	3
		Prevention and Control	10	2.2	Non-communio	cable Diseases- Obesity, Diabetes and AIDS, Asthma.	2
				2.3	Nutrition- Nutr Health disorders due t	ritional requirements for daily living. Balance Diet.	3
				2.4	Postural deform	mities- Causes and corrective exercise of Kyphosis.	3
					Lordosis, Scolic	osis, Knock Knees and Flat Foot.	
1.	MD YUSUF						
	A11						
		Unit- IV: Health and First-aid	10	4.1	First aid- Mean aid.	ning, definition, importance and golden rules of First-	3
		Management		4.2	Concept of spo	orts injuries- Sprain, Strain, Facture and Dislocation.	3
				4.3	Management of therapy and Th	of sports injuries through the application of Hydro- nermo- therapy.	3
				4.4	Management of and Massage t	of sports injuries through the application of Exercise herapy.	3
		PRACTICAL	20	1.	First-aid Practi	ical- Triangular Bandage: Slings (Arm Sling, Collar &	2
					Cuff Sling), Roll Eight, Spica.	ler Bandages: Simple Spiral, Reverse Spiral, Figure of	
					Practical know	ledge on Hydro-therapy and Thermo-therapy.	2
		SEC2: UNIT-3 & 4:		3.1	Standing	3.1.1 Ardhachandrasana, 3.1.2 Brikshasana,	1
		Asanas &	20		Position	3.1.3 Padahastasana	
		Pranayama (any two)		3.2	Sitting Position	3.2.1Ardhakurmasana, 3.2.2 Paschimottanasana 3.2.3Gomukhasana	1
		SEC2: UNIT-3 & 4:		3.3	Supine	3.3.1Setubandhasana, 3.3.2 Halasana,	1
		Pranavama (anv			Position	3.3.3Matsyasana	
		two)		3.4	Prone	3.4.1 Bhujangasana, 3.4.2 Salvasana, 3.4.3	1
		,			Position	Dhanurasana	
				3.5	Inverted Position	3.5.1 Sarbangasana, 3.5.2 Shirsasana, 3.5.3 Bhagrasana	1
				1.	Pranayama (any two)	4.1 Kapalbhati, 4.2 Bhramri, 4.3 Anulam Vilom	1

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SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2020-2021,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

S.L NO.	TEACHER NAME	UNIT	MARKS	CHA PTER	SYLLABUS	CLASS
		Unit- I:		1.1	Concept, definition and dimension of Health.	3
				1.2	Definition, aim, objectives and principles of Health Education.	2
			10	1.3	Health Agencies- World Health Organization (WHO), United Nations Educational Scientific and Cultural Organization (UNESCO).	3
				1.4	School Health Program- Health Service, Health Instruction, Health Supervision, Health appraisal and Health Record.	3
2.	MUHAMM AD ALI	Unit- III: Physical Fitness and		3.1	Physical Fitness- Meaning, definition and Importance of Physical Fitness.	3
	SAIKH	vveiness 10	3.2	Components of Physical Fitness- Health and Performance related Physical Fitness.	3	
				3.3	Concept of Wellness. Relationship between Physical activities and Wellness.	2
				3.4	Ageing- Physical activities and its importance	2
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1
		SEC2: UNIT-1 & 2: GYMNASTICS	20	1	1.1 Forward Roll, 1.1 T-Balance, 1.1 Forward Roll with Split leg, 1.1 Backward Roll, 1.1 Cart-Wheel	2
		SEC1: INTERNAL ASSESSMENT	10	2	2.1 Dive and Forward Roll, 2.2 Hand Spring, 2.3 Head Spring, 2.4 Neck Spring, 2.5 Hand Stand and Forward Roll, 2.6 Summersault	2

SEC2: Gymnastics and Yoga

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SEMESTER-6, (January-Jun), Corse Code- DSE 1B, SESSION: 2020-2021,

SUBJECT: Psychology in Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	СНА	SYLLABUS	CLASS
NO.	NAME			PTER		
1 M		Unit- I:		1.1	Meaning and definition Psychology.	3
		Introduction		1.2	Importance and scope of Psychology.	2
			10	1.3	Meaning and definition Sports Psychology.	2
			1.4	Need for knowledge of Sports Psychology in the field of Physical Education.	3	
	ALI	Unit- IV: Stress and Anxiety		4.1	Stress- Meaning, definition and types of Stress.	3
			10	4.2	Causes of Stress.	2
				4.3	Anxiety- Meaning, definition and types of Anxiety.	3
				4.4	Management of Stress and Anxiety through physical activity and sports.	3
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1

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SEMESTER-6, (January-Jun), SEC4, SESSION: 2020-2021,

SUBJECT: SEC4: BALL GAMES (Any two)

S.L	TEACHER NAME	UNIT	MA	CHAP	SYLLABUS	CLASS
NO.			RKS	TER		
		SEC4: BALL GAMES (Anv	20	1.	Kicking: Kicking the ball with inside of the foot, Kicking the ball with Full Instep of the foot, Kicking the ball with Inner Instep of the foot, Kicking the ball with Outer Instep of the foot and Lofted Kick.	3
		two).		2.	Trapping: Trapping- the Rolling ball, and the Bouncing ball with sole of the foot.	2
		FOOTBALL		3.	Dribbling: Dribbling the ball with Instep of the foot, Dribbling the ball with Inner and Outer Instep of the foot.	2
				4.	Heading: In standing, running and jumping condition.	2
		A. Fundamental		5.	Throw-in: Standing throw-in and Running throw-in.	3
		skills		6.	Feinting: With the lower limb and upper part of the body.	2
				7	Tackling: Simple Tackling, Slide Tackling.	2
				8	Goal Keeping: Collection of Ball, Ball clearance- kicking, throwing and deflecting.	3
				9	Game practice with application of Rules and Regulations.	2
1.	MD YUSUF ALI			В.	Rules and their interpretation and duties of officials.	3
		HANDBALL		1.	Catching, Throwing and Ball control,	2
		• • · · · · · · · · ·		2.	Goal Throws: Jump shot, Center shot, Dive shot, Reverse shot.	2
		A. Fundamental		3.	Dribbling: High and low.	2
		SKIIIS		4.	Attack and counter attack, simple counter attack, counter attack from two wings and center.	2
				5.	Blocking, GoalKeeping and Defensive skills.	2
				6.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	2
		BASKETBALL		1.	Passing: Two hand Chest Pass, Two hands Bounce Pass, One hand Baseball Pass, Side arm Pass, Overhead Pass, Hook Pass.	2
				2.	Receiving: Two hand receiving, One hand receiving, Receiving in stationary position, Receiving while Jumping and Receiving while Running.	2
		A. Fundamental Skills		3.	Dribbling: How to start dribble, drop dribble, High Dribble, Low Dribble, Reverse Dribble, Rolling Dribble.	2
				4.	Shooting: Lay-up shot and its variations, One hand set shot, Two hands jump shot, Hook shot, Free Throw.	2
				5.	Rebounding: Defensive rebound and Offensive rebound.	2
				6.	Individual Defence: Guarding the player with the ball and without the ball, Pivoting.	2
				7.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	2

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SEMESTER-6, (January-Jun), Corse Code- DSE 1B, SESSION: 2020-2021,

SUBJECT: Psychology in Physical Education and Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHA PTER	SYLLABUS	CLASS
		Unit-II:		2.1	Meaning and definition of learning.	2
		Learning		2.2	Theories of learning and Laws of learning.	2
			10	2.3	Learning curve: Meaning and Types.	3
				2.4	Transfer of learning- Meaning, definition type and factors affecting transfer of learning.	3
2.	MUHAMM	Unit- III: Psychological	10	3.1	Motivation- Meaning, definition, type and importance of Motivation in Physical Education and Sports.	2
	AD ALI SAIKH	Factors	10	3.2	Emotion- Meaning, definition, type and importance of Emotion in Physical Education and Sports.	3
				3.3	Personality- Meaning, definition and type Personality traits.	3
				3.4	Role of physical activities in the development of personality.	2
		PRACTICAL	20	1.	Assessment of Personality, Stress and Anxiety (any one)	2
				2.	Measurement of Reaction Time, Depth Perception and Mirror Drawing (any one).	2

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SEMESTER-6, (January-Jun), SEC4, SESSION: 2020-2021,

SUBJECT: SEC4: BALL GAMES (Any two)

S.L	TEACHER NAME	UNIT	MA	СНАР	SYLLABUS	CLASS
NO.			RKS	TER		
					Comiton Under ann ann ion Cide ann ann ion Tonnis ann ion	
		SEC4: BALL GAMES (Any two).	20	1.	Floating service.	3
		VOLLEYBALL		2.	Pass: Under arm pass, Over head pass.	2
		A. Fundamental skills		3.	Spiking and Blocking.	2
				4.	Game practice with application of Rules and Regulations.	3
2	ΜΠΗΦΜΜΦΟ ΑΠ			5.	Rules and their interpretation and duties of officials.	2
	SAIKH	NETBALL		1.	Catching: one handed, two handed, with feet grounded and in flight.	2
				2.	Throwing (Different passes and their uses): One hand passes (shoulder, high shoulder, underarm, bounce, lob), two hand passes (Push, overhead and bounce).	3
				3.	Footwork: Landing on one foot, landing on two feet, Pivot, Running pass.	3
				4.	Shooting: One hand, forward step shot, and backward step shot.	2
				5.	Techniques of free dodge and sprint, sudden sprint, sprint and stop, sprinting with change at speed.	3
				6.	Defending: Marking the player, marking the ball, blocking, inside the circle, outside the circle. Defending the circle edge against the passing.	2
				7.	Intercepting: Pass and shot.	2
				8.	Game practice with application of Rules and Regulations.	3
				В.	Rules and their interpretation and duties of officials.	2
		THROWBALL A. Fundamental Skills		1.	Overhand service, Side arm service, two hand catching, one hand overhead return, side arm return.	3
				2.	Rules and their interpretations and duties of officials.	2
		INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1 (July-dec.) Corse Code- CC1A, SESSION: 2021-2022,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.	NAME			TER		
		Corse Code- CC1A		1.1	Meaning and definition of Physical Education.	1
		Unit- I: Introduction	10	1.2	Aim and objectives of Physical Education.	1
			10	1.3	Modern concept of Physical Education.	1
				1.4	Importance of Physical Education.	1
1.	MD YUSUF					
	ALI	Unit- II: Biological and Sociological Foundations of Physical	10	2.1	Biological Foundation- Meaning and definition of growth and development. Factors affecting growth and development. Differences of growth and development. Principles of growth and development.	3
		Education		2.2	Age- Chronological age, anatomical age, physiological age and mental age.	3
				2.3	Sociological Foundation- Meaning and definition of Sociology, Society and Socialization.	2
				2.4	Role of games and sports in National and International integration.	2
				1	Learn and demonstrate the technique of Suryanamaskar.	3
		Practical	20	2	Development of physical fitness through Callisthenics and Aerobic activities.	3

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DUMKAL COLLEGE

SEMESTER-1 (July-dec.), Corse Code- CC1A, SESSION: 2021-2022,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER NAME	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.				TER		
		Unit- III: History		3.1	Historical development of Physical Education and Sports in	3
		of Physical			India- Pre-Independence period and Post-Independence	
		Education			period.	
			10	3.2	Olympic Movement- Ancient Olympic Games and Modern	3
					Olympic Games.	5
				3.3	Brief historical background of Asian Games and	2
					commonwearth Games.	
2.	MUHAMMAD ALI			3.4	National Sports Awards- Arjuna Award, Rajiv Gandhi Khel	3
	SAIKH				Ratna Award, Dronacharya Award	0
						_
		Unit- IV: Yoga		4.1	Meaning and definition of the term Yoga, types, aim,	3
		Education	10		objectives and important of foga.	
			10	4.2	History of Yoga.	2
						_
				4.3	Astanga Yoga	2
					Hatha Yoga	2
				4.4		2
		INTERNAL	15	1	Internal Assessment & class attendance	1
		ASSESSMENT				-

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DEPARTMENT OF PHYSICAL EDUCATION

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2021-2022,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	CHAP	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- I: Introduction		1.1	Meaning and definition of Anatomy, Physiology and Exercise Physiology.	3
			10	1.2	Importance of Anatomy, Physiology and Exercise Physiology in Physical Education.	2
				1.3	Human Cell- Structure and function.	2
				1.4	Tissue- Types and functions.	3
1.	MD YUSUF ALI	Unit- II: Musculo- skeletal System	10	2.1	Skeletal System- Structure of Skeletal System. Classification and location of bones and joints. Anatomical differences between male and female.	4
				2.2	Muscular System- Type, location, function and structure of muscle.	3
				2.3	Types of muscular contraction.	3
				2.4	Effect of exercise on muscular system.	3
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	3
		SEC1: UNIT-2: Field events	20	2.1	Long Jump: Approach Run, Take-off, Flight in the air (Hang Style/Hitch Kick) and Landing.	3
				2.2	High jump: Approach Run, Take-off, Bar Clearance (Straddle) and Landing.	3
				2.3	Shot put: Holding the Shot, Placement, Initial Stance, Glide, Delivery Stance and Recovery (Perry O'Brien Technique).	3
				2.4	Discus Throw: Holding the Discus, Initial Stance, Primary Swing, Turn, Release and Recovery (Rotation in the circle).	3
				2.5	Javelin Throw: Grip, Carry, Release and Recovery (3/5 Impulse stride).	3
		SEC1: INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2021-2022,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	CHAP	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- III: Circulatory		1.1	Blood- Composition and function.	2
		System	10	1.2	Heart- Structure and functions. Mechanism of blood circulation through heart.	3
				1.3	Blood Pressure, Athletic Heart and Bradycardia.	2
				1.4	Effect of exercise on circulatory system.	2
2.	MUHAMMAD					
	ALI SAIKH	Unit- IV: Respiratory		2.1	Structure and function of Respiratory organs.	2
	Sys	System	20	2.2	Mechanism of Respiration.	2
		CC: Practical		2.3	Vital Capacity, O2 Debt and Second Wind.	3
				2.4	Effect of exercise on respiratory system.	2
				1	Assessments of BMI and WHR.	2
				2	Assessment of Heart rate, Blood Pressure, Respiratory Rate, and Pick Flow Rate	2
		SEC1: UNIT-1:	20	1.1	Starting Techniques: Standing start and Crouch start (its variations) use of Block.	3
		Track Events		1.2	Acceleration with proper running techniques.	3
				1.3	Finishing technique: Run Through, Forward Lunging and Shoulder Shrug.	3
				1.4	Relay Race: Starting, Baton Holding/Carrying, Baton Exchange in between zone, and Finishing	3

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SEMESTER-5, (July-dec.) Corse Code- DSE 1A, & SEC3, SESSION: 2021-2022,

SUBJECT: Sports Training

SEC3: Indian Games and Racket Sports

S.L	TEACHER	UNIT	MARKS	CHAP	SYLLABUS	CLASS
NO.	NAME			TER		02/05
		Unit- II: Principle		2.1	Warming up and Cooling down- Meaning, types and methods.	2
		Conditioning	10	2.2	Conditioning- Concept of Conditioning and its principles.	3
				2.3	Training Methods- Circuit Training, Interval Training, Weight Training.	2
1				2.4	Periodisation- Meaning, types, aim and contents of different periods.	2
1.	ALI	Unit- III: Training Load and	10	3.1	Training Load- Meaning, definition, types and factors of training load.	3
		Adaptation		3.2	Components of training load.	2
				3.3	Over Load- Meaning, causes, symptoms and tackling of over load.	3
				3.4	Adaptation- Meaning and conditions of adaptation, Supercompensation.	2
		DSE: Practical	20	1.	Practical Experience of Weight Training and Circuit Training (any one).	2
				2.	Measurement of Speed, Strength (Grip/Leg), Explosive Strength (Leg) and Flexibility (any two).	3
		SEC3: Indian Games and Backet Sports	20	1.	Skills in Raiding: Touching with hands, Use of leg-toe touch, squat leg thrust, side kick, mule kick, arrow fly kick, crossing of baulk line. Crossing of Bonus line.	3
		KABADDI A. Fundamental		2.	Skills of holding the raider: Various formations, catching from particular position, different catches, catching formation and techniques.	3
		skills		3.	Additional skills in raiding: Escaping from various holds, techniques of escaping from chain formation, offense and defence.	3
				4.	Game practice with application of Rules and Regulations.	2
		KHO-KHO A. Fundamental		В.	Rules and their interpretations and duties of the officials.	2
		skills		1.	Skills in Chasing: Sit on the box (Parallel & Bullet toe method), Get up from the box (Proximal & Distyal foot method), Give Kho (Simple, Early, Late & Judgment), Pole Turn, Pole Dive, Tapping, Hammering, Rectification of foul.	4
				2.	Skills in running: Chain Play, Ring play and Chain & Ring mixed play.	2
				3.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretations and duties of the officials.	2

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SEMESTER-5, (July-dec.) Corse Code- DSE 1A, & SEC3, SESSION: 2021-2022,

SUBJECT: Sports Training

SEC3: Indian Games and Racket Sports

S.L	TEACHER	UNIT	MARKS	CHAP	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- I:		2.1	Meaning and definition of Sports Training.	2
		moduction	10	2.2	Aim and characteristics of Sports Training.	2
			10	2.3	Principles of Sports Training.	2
				2.4	Importance of Sports Training.	2
2.	MUHAMMAD	Unit- IV: Training Techniques		3.1	Strength- Means and methods of strength development.	2
	ALI SAIKH	•	10	3.2	Speed- Means and methods of speed development.	2
				3.3	Endurance- Means and methods of endurance development.	2
				3.4	Flexibility- Means and methods of flexibility development.	2
		INTERNAL ASSESSMENT	20	1	Internal Assessment & class attendance	1
		SEC3: Indian Games and	20	1.	1. Basic Knowledge: Various parts of the Racket and Grip.	2
		Racket Sports.		2.	2. Service: Short service, Long service, Long-high service.	2
		BADMINTON A. Fundamental		3.	3. Shots: Over head shot, Defensive clear shot, Attacking clear shot, Drop shot, Net shot, Smash.	3
		skills		4.	4. Game practice with application of Rules and Regulations.	2
				В.	B. Rules and their interpretations and duties of the officials.	3
		TABLE TENNIS		1.	1. Basic Knowledge: Various parts of the Racket and Grip (Shake Hand & Pen Hold Grip).	2
		A. Fundamental skills		2.	2. Stance: Alternate & Parallel.	2
				3.	3. Push and Service: Backhand & Forehand.	2
				4.	4. Chop: Backhand & Forehand.	2
				5.	5. Receive: Push and Chop with both Backhand & Forehand.	2
				6.	6. Game practice with application of Rules and Regulations.	2
				В.	B. Rules and their interpretations and duties of the officials.	2
		INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2021-2022,

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- II: Tournaments		2.1	Tournaments: Meaning and definition and types of tournaments (Knock-out, League, Combination, Challenge).	4
			10	2.2	Procedure of drawing fixture.	3
				2.3	Method of organising Annual Athletic Meet and Play Day.	3
				2.4	Method of organising of Intramural and Extramural competition.	3
1.						
		Unit- IV:		4.2	Meaning and definition of leadership.	2
		Leadership	10	4.3	Principles of leadership activities.	3
				4.4	Qualities of good leader in Physical Education.	3
				4.2	Hierarchy of Leadership in School, College and University level.	3
		Practica		1	Track and Field events (any one).	3
		Lay out knowledge and Officiating ability-	20	2	Games: Football, Kabaddi, Kho-Kho and Volleyball (any one).	4

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SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2021-2022,

CORE PAPER- 2: Management of Physical Education and Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Unit- I: Introduction		1.1	Concept and definition of Sports Management.	2
			10	1.2	Important of Sports Management.	2
			10	1.3	Purpose of Sports Management.	2
				1.4	Principles of Sports Management.	3
2.	MUHAMMAD					
	ALI SAIKH	Unit- III: Facilities and Equipment		3.1	Method of calculation of Standard Athletic Track marking.	3
			10	3.2	Care and maintenance of play ground and gymnasium.	3
				3.3	Importance, care and maintenance of sports Equipment.	2
				3.4	Time Table: Meaning, importance and factors affecting school's physical education Time Table.	3
		INTERNAL ASSESSMENT	15	1	Internal assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

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SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2021-2022,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER		SYLLABUS	CLASS	
		Unit- II: Health Problems in		2.1	Communicable Diarrhoea.	e Diseases- Malaria, Dengue and Chicken Pox and	3	
		India- Prevention and Control	10	2.2	Non-communio	Non-communicable Diseases- Obesity, Diabetes and AIDS, Asthma.		
				2.3	Nutrition- Nuti Health disorde	ritional requirements for daily living. Balance Diet. rs due to deficiencies of Vitamins and Minerals.	3	
				2.4	Postural deform Lordosis, Scolid	mities- Causes and corrective exercise of Kyphosis, osis, Knock Knees and Flat Foot.	3	
1.	Unit- IV: Ho 1. MD YUSUF and First-	Unit- IV: Health and First-aid	10	4.1	First aid- Mean aid.	ing, definition, importance and golden rules of First-	3	
	ALI	Management	10	4.2	Concept of spo	rts injuries- Sprain, Strain, Facture and Dislocation.	3	
				4.3	Management of therapy and Th	of sports injuries through the application of Hydro- nermo- therapy.	3	
				4.4	Management o and Massage t	Management of sports injuries through the application of Exercise and Massage therapy.		
		PRACTICAL	20	1.	First-aid Practi Cuff Sling), Rol Eight, Spica.	ical- Triangular Bandage: Slings (Arm Sling, Collar & Ier Bandages: Simple Spiral, Reverse Spiral, Figure of	2	
					Practical know	ledge on Hydro-therapy and Thermo-therapy.	2	
		SEC2: UNIT-3 & 4: Asanas &	20	3.1	Standing Position	3.1.1 Ardhachandrasana, 3.1.2 Brikshasana, 3.1.3 Padahastasana	1	
		Pranayama (any two)		3.2	Sitting Position	3.2.1Ardhakurmasana, 3.2.2 Paschimottanasana 3.2.3Gomukhasana	1	
		SEC2: UNIT-3 & 4:		3.3	Supine Position	3.3.1Setubandhasana, 3.3.2 Halasana, 3.3.3Matsyasana	1	
		Asanas & Pranayama (any		3.4	Prone Position	3.4.1 Bhujangasana, 3.4.2 Salvasana, 3.4.3 Dhanurasana	1	
		two)		3.5	Inverted Position	3.5.1 Sarbangasana, 3.5.2 Shirsasana, 3.5.3 Bhagrasana	1	
				1.	Pranayama (any two)	4.1 Kapalbhati, 4.2 Bhramri, 4.3 Anulam Vilom	1	

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SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2021-2022,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- I: Introduction		1.1	Concept, definition and dimension of Health.	3
			10	1.2	Definition, aim, objectives and principles of Health Education.	2
			10	1.3	Health Agencies- World Health Organization (WHO), United Nations Educational Scientific and Cultural Organization (UNESCO).	3
2.	MUHAMMAD			1.4	School Health Program- Health Service, Health Instruction, Health Supervision, Health appraisal and Health Record.	3
		Unit- III: Physical Fitness and	10	3.1	Physical Fitness- Meaning, definition and Importance of Physical Fitness.	3
		weiness		3.2	Components of Physical Fitness- Health and Performance related Physical Fitness.	3
				3.3	Concept of Wellness. Relationship between Physical activities and Wellness.	2
				3.4	Ageing- Physical activities and its importance	2
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1
		SEC2: UNIT-1 & 2: GYMNASTICS	20	1	1.1 Forward Roll,1.1 T-Balance,1.1 Forward Roll with Split leg,1.1 Backward Roll,1.1 Cart-Wheel	2
		SEC1: INTERNAL ASSESSMENT	10	2	2.1 Dive and Forward Roll, 2.2 Hand Spring, 2.3 Head Spring, 2.4 Neck Spring, 2.5 Hand Stand and Forward Roll, 2.6 Summersault	2

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DUMKAL COLLEGE

SEMESTER-6, (January-Jun), Corse Code- DSE 1B, SESSION: 2021-2022,

SUBJECT: Psychology in Physical Education and Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Unit- I: Introduction		1.1	Meaning and definition Psychology.	2
			10	1.2	Importance and scope of Psychology.	3
				1.3	Meaning and definition Sports Psychology.	2
				1.4	Need for knowledge of Sports Psychology in the field of Physical Education.	2
		Unit- IV: Stress and Anxiety		4.1	Stress- Meaning, definition and types of Stress.	3
1.	MD YUSUF		10	4.2	Causes of Stress.	3
	ALI			4.3	Anxiety- Meaning, definition and types of Anxiety.	2
				4.4	Management of Stress and Anxiety through physical activity and sports.	3
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1

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SEMESTER-6, (January-Jun), SEC4, SESSION: 2021-2022,

SUBJECT: SEC4: BALL GAMES (Any two)

S.L	TEACHER NAME	UNIT	MARKS	CHAPTER	SYLLABUS	CLASS
NO.						
		SEC4: BALL GAMES (Any two).	20	1.	Kicking: Kicking the ball with inside of the foot, Kicking the ball with Full Instep of the foot, Kicking the ball with Inner Instep of the foot,	3
		FOOTBALL			Kicking the ball with Outer instep of the foot and Lofted Kick.	2
		A. Fundamental skills		2.	the foot.	2
				3.	Dribbling: Dribbling the ball with Instep of the foot, Dribbling the ball with Inner and Outer Instep of the foot.	2
1	MD YUSUF ALI			4.	Heading: In standing, running and jumping condition.	2
1.				5.	Throw-in: Standing throw-in and Running throw-in.	3
				6.	Feinting: With the lower limb and upper part of the body.	2
				7	Tackling: Simple Tackling, Slide Tackling.	2
				8	Goal Keeping: Collection of Ball, Ball clearance- kicking, throwing and deflecting.	3
				9	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	3
		HANDBALL		1.	Catching, Throwing and Ball control,	2
		A. Fundamental Skills		2.	Goal Throws: Jump shot, Center shot, Dive shot, Reverse shot.	2
				3.	Dribbling: High and low.	2
				4.	Attack and counter attack, simple counter attack, counter attack from	2
					two wings and center.	
				5.	Blocking, GoalKeeping and Defensive skills.	2
				6.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	2
		BASKETBALL A. Fundamental Skills		1.	Passing: Two hand Chest Pass, Two hands Bounce Pass, One hand Baseball Pass, Side arm Pass, Overhead Pass, Hook Pass.	2
				2.	Receiving: Two hand receiving, One hand receiving, Receiving in stationary position, Receiving while Jumping and Receiving while Running.	2
				3.	Dribbling: How to start dribble, drop dribble, High Dribble, Low Dribble, Reverse Dribble, Rolling Dribble.	2
				4.	Shooting: Lay-up shot and its variations, One hand set shot, Two hands jump shot, Hook shot, Free Throw.	2
				5.	Rebounding: Defensive rebound and Offensive rebound.	2
				6.	Individual Defence: Guarding the player with the ball and without the ball, Pivoting.	2
				7.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	2

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SEMESTER-6, (January-Jun), Corse Code- DSE1B, SESSION: 2021-2022,

SUBJECT: Psychology in Physical Education and Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Unit- II: Learning		2.1	Meaning and definition of learning.	2
				2.2	Theories of learning and Laws of learning.	2
			10	2.3	Learning curve: Meaning and Types.	3
2. MUHAN ALI SA				2.4	Transfer of learning- Meaning, definition type and factors affecting transfer of learning.	3
	MUHAMMAD ALI SAIKH	Unit- III: Psychological	10	3.1	Motivation- Meaning, definition, type and importance of Motivation in Physical Education and Sports.	2
		Factors		3.2	Emotion- Meaning, definition, type and importance of Emotion in Physical Education and Sports.	3
				3.3	Personality- Meaning, definition and type Personality traits.	3
				3.4	Role of physical activities in the development of personality.	2
		PRACTICAL	20	1.	Assessment of Personality, Stress and Anxiety (any one)	2
				2.	Measurement of Reaction Time, Depth Perception and Mirror Drawing (any one).	2

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SEMESTER-6, (January-Jun), SEC4, SESSION: 2021-2022,

SUBJECT: SEC4: BALL GAMES (Any two)

S.L	TEACHER NAME	UNIT	MAR	CHAPT	SYLLABUS	CLASS
NO.			KS	ER		
		SEC4: BALL GAMES (Any two).	20	1.	Service: Under arm service, Side arm service, Tennis service, Floating service.	3
		VOLLEYBALL		2.	Pass: Under arm pass, Over head pass.	2
		A. Fundamental skills		3.	Spiking and Blocking.	2
				4.	Game practice with application of Rules and Regulations.	3
2.	MUHAMMAD ALI			5.	Rules and their interpretation and duties of officials.	2
	SAIKH	NETBALL A. Fundamental Skills		1.	Catching: one handed, two handed, with feet grounded and in flight.	2
				2.	Throwing (Different passes and their uses): One hand passes (shoulder, high shoulder, underarm, bounce, lob), two hand passes (Push, overhead and bounce).	3
				3.	Footwork: Landing on one foot, landing on two feet, Pivot, Running pass.	3
				4.	Shooting: One hand, forward step shot, and backward step shot.	2
				5.	Techniques of free dodge and sprint, sudden sprint, sprint and stop, sprinting with change at speed.	3
				6.	Defending: Marking the player, marking the ball, blocking, inside the circle, outside the circle. Defending the circle edge against the passing.	2
				7.	Intercepting: Pass and shot.	2
				8.	Game practice with application of Rules and Regulations.	3
				В.	Rules and their interpretation and duties of officials.	2
		THROWBALL		1.	Overhand service, Side arm service, two hand catching, one hand overhead return, side arm return.	3
				2.	Rules and their interpretations and duties of officials.	2
		INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-1 (July-dec.) Corse Code- CC1A, SESSION: 2022-2023,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Corse Code- CC1A		1.1	Meaning and definition of Physical Education.	1
		Unit- I: Introduction	10	1.2	Aim and objectives of Physical Education.	1
			10	1.3	Modern concept of Physical Education.	1
				1.4	Importance of Physical Education.	1
1.	MD YUSUF					
	ALI Unit- II: Biological and Sociological Foundations of Physical	Unit- II: Biological and Sociological Foundations of Physical	10	2.1	Biological Foundation- Meaning and definition of growth and development. Factors affecting growth and development. Differences of growth and development. Principles of growth and development.	3
		Education		2.2	Age- Chronological age, anatomical age, physiological age and mental age.	3
				2.3	Sociological Foundation- Meaning and definition of Sociology, Society and Socialization.	2
				2.4	Role of games and sports in National and International integration.	2
				1	Learn and demonstrate the technique of Suryanamaskar.	3
		Practical	20	2	Development of physical fitness through Callisthenics and Aerobic activities.	3

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SEMESTER-1 (July-dec.), Corse Code- CC1A, SESSION: 2022-2023,

SUBJECT: CORE PAPER-1: FOUNDATION AND HISTORY OF PHYSICAL EDUCATION

S.L	TEACHER NAME	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.				TER		
		Unit III: History		2.1	Historical development of Physical Education and Sports in	2
		onit- III: History		5.1	India- Pre-Independence period and Post-Independence	3
		of Physical			period.	
		Education			P	
			10	3.2	Olympic Movement- Ancient Olympic Games and Modern	3
					Olympic Games.	
				3.3	Brief historical background of Asian Games and	2
					Commonwealth Games.	-
2.	MUHAMMAD ALI			3.4	National Sports Awards- Arjuna Award, Rajiv Gandhi Khel	3
	SAIKH				Ratna Award, Dronacharya Award	3
		Unit- IV: Yoga	Unit- IV: Yoga Education	4.1	Meaning and definition of the term Yoga, types, aim,	3
		Education			objectives and important of Yoga.	
			10	4.2	History of Yoga.	2
						2
				4.3	Astanga Yoga	2
				4.4	Hatha Yoga	2
		INTERNAL	15	1	Internal Assessment & class attendance	1
		ASSESSMENT				
				I	I	1

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2022-2023,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- I: Introduction		1.1	Meaning and definition of Anatomy, Physiology and Exercise Physiology.	3
			10	1.2	Importance of Anatomy, Physiology and Exercise Physiology in Physical Education.	2
				1.3	Human Cell- Structure and function.	2
				1.4	Tissue- Types and functions.	3
1.	MD YUSUF ALI	Unit- II: Musculo- skeletal System	10	2.1	Skeletal System- Structure of Skeletal System. Classification and location of bones and joints. Anatomical differences between male and female.	4
				2.2	Muscular System- Type, location, function and structure of muscle.	3
				2.3	Types of muscular contraction.	3
				2.4	Effect of exercise on muscular system.	3
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	3
		SEC1: UNIT-2: Field events	20	2.1	Long Jump: Approach Run, Take-off, Flight in the air (Hang Style/Hitch Kick) and Landing.	3
				2.2	High jump: Approach Run, Take-off, Bar Clearance (Straddle) and Landing.	3
				2.3	Shot put: Holding the Shot, Placement, Initial Stance, Glide, Delivery Stance and Recovery (Perry O'Brien Technique).	3
				2.4	Discus Throw: Holding the Discus, Initial Stance, Primary Swing, Turn, Release and Recovery (Rotation in the circle).	3
				2.5	Javelin Throw: Grip, Carry, Release and Recovery (3/5 Impulse stride).	3
		SEC1: INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

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SEMESTER-3, (July-dec.) Corse Code- CC1C, & SEC1, SESSION: 2022-2023,

SUBJECT: CORE PAPER- 3: Anatomy, Physiology and Exercise Physiology

SEC1: Track and Field

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- III: Circulatory	10	1.1	Blood- Composition and function.	2
		System		1.2	Heart- Structure and functions. Mechanism of blood circulation through heart.	3
				1.3	Blood Pressure, Athletic Heart and Bradycardia.	2
			1.4	Effect of exercise on circulatory system.	2	
2.	MUHAMMAD					
	ALI SAIKH Unit- IV: Respiratory System	Unit- IV: Respiratory	10	2.1	Structure and function of Respiratory organs.	2
		System		2.2	Mechanism of Respiration.	2
				2.3	Vital Capacity, O2 Debt and Second Wind.	3
				2.4	Effect of exercise on respiratory system.	2
				1	Assessments of BMI and WHR.	2
		CC: Practical	20	2	Assessment of Heart rate, Blood Pressure, Respiratory Rate, and Pick Flow Rate	2
		SEC1: UNIT-1:	20	1.1	Starting Techniques: Standing start and Crouch start (its variations) use of Block.	3
	Track Events	Track Events	20	1.2	Acceleration with proper running techniques.	3
				1.3	Finishing technique: Run Through, Forward Lunging and Shoulder Shrug.	3
				1.4	Relay Race: Starting, Baton Holding/Carrying, Baton Exchange in between zone, and Finishing	3

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SEMESTER-5, (July-dec.) Corse Code- DSE 1A, & SEC3, SESSION: 2022-2023,

SUBJECT: Sports Training

SEC3: Indian Games and Racket Sports

51	TEACHER	LINIT	MARKS	СНАР	SVILABLIS	
NO.	NAME	ONT	MARKS	TER	JILLADUJ	CLASS
		Unit- II: Principle		2.1	Warming up and Cooling down- Meaning, types and methods.	2
		Conditioning	10	2.2	Conditioning- Concept of Conditioning and its principles.	3
				2.3	Training Methods- Circuit Training, Interval Training, Weight Training.	2
1				2.4	Periodisation- Meaning, types, aim and contents of different periods.	2
1.	ALI	Unit- III: Training Load and	10	3.1	Training Load- Meaning, definition, types and factors of training load.	3
		Adaptation		3.2	Components of training load.	2
				3.3	Over Load- Meaning, causes, symptoms and tackling of over load.	3
				3.4	Adaptation- Meaning and conditions of adaptation, Supercompensation.	2
		DSE: Practical	20	1.	Practical Experience of Weight Training and Circuit Training (any one).	2
				2.	Measurement of Speed, Strength (Grip/Leg), Explosive Strength (Leg) and Flexibility (any two).	3
		SEC3: Indian Games and Racket Sports.	20	1.	Skills in Raiding: Touching with hands, Use of leg-toe touch, squat leg thrust, side kick, mule kick, arrow fly kick, crossing of baulk line. Crossing of Bonus line.	3
		KABADDI A. Fundamental skills		2.	Skills of holding the raider: Various formations, catching from particular position, different catches, catching formation and techniques.	3
				3.	Additional skills in raiding: Escaping from various holds, techniques of escaping from chain formation, offense and defence.	3
				4.	Game practice with application of Rules and Regulations.	2
		KHO-KHO A. Fundamental		В.	Rules and their interpretations and duties of the officials.	2
		skills		1.	Skills in Chasing: Sit on the box (Parallel & Bullet toe method), Get up from the box (Proximal & Distyal foot method), Give Kho (Simple, Early, Late & Judgment), Pole Turn, Pole Dive, Tapping, Hammering, Rectification of foul.	4
				2.	Skills in running: Chain Play, Ring play and Chain & Ring mixed play.	2
				3.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretations and duties of the officials.	2

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SEMESTER-5, (July-dec.) Corse Code- DSE 1A, & SEC3, SESSION: 2022-20223,

SUBJECT: Sports Training

SEC3: Indian Games and Racket Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Unit- I:		2.1	Meaning and definition of Sports Training.	2
		miloduction		2.2	Aim and characteristics of Sports Training.	2
			10	2.3	Principles of Sports Training.	2
				2.4	Importance of Sports Training.	2
2.	MUHAMMAD	Unit- IV: Training Techniques		3.1	Strength- Means and methods of strength development.	2
	ALI SAIKH	•	10	3.2	Speed- Means and methods of speed development.	2
				3.3	Endurance- Means and methods of endurance development.	2
				3.4	Flexibility- Means and methods of flexibility development.	2
	INTERNAL ASSESSMENT	20	1	Internal Assessment & class attendance	1	
		SEC3: Indian Games and	20	1.	1. Basic Knowledge: Various parts of the Racket and Grip.	2
		Racket Sports.		2.	2. Service: Short service, Long service, Long-high service.	2
		BADMINTON A. Fundamental		3.	3. Shots: Over head shot, Defensive clear shot, Attacking clear shot, Drop shot, Net shot, Smash.	3
		skills		4.	4. Game practice with application of Rules and Regulations.	2
				В.	B. Rules and their interpretations and duties of the officials.	3
		TABLE TENNIS		1.	1. Basic Knowledge: Various parts of the Racket and Grip (Shake Hand & Pen Hold Grip).	2
		A. Fundamental skills		2.	2. Stance: Alternate & Parallel.	2
				3.	3. Push and Service: Backhand & Forehand.	2
				4.	4. Chop: Backhand & Forehand.	2
				5.	5. Receive: Push and Chop with both Backhand & Forehand.	2
				6.	6. Game practice with application of Rules and Regulations.	2
				В.	B. Rules and their interpretations and duties of the officials.	2
		INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

Head of the Department Dept of Physical Education Dumkal College, Murshidabad Principal Dumkal College, Basantapur Murshidabad, W.B.

DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2022-2023,

CORE PAPER- 2: Management of Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	
NO.	NAME			TER		
		Unit- II:		2.1	Tournaments: Meaning and definition and types of	4
		Tournaments			tournaments (Knock-out, League, Combination, Challenge).	
				2.2	Procedure of drawing fixture.	3
			10			
				2.3	Method of organising Annual Athletic Meet and Play Day.	3
				2.4	Method of organising of Intramural and Extramural competition.	3
1.						
		Unit- IV: Leadership		4.2	Meaning and definition of leadership.	2
			10	4.3	Principles of leadership activities.	3
				4.4	Qualities of good leader in Physical Education.	3
				4.2	Hierarchy of Leadership in School, College and University level.	3
		Practica		1	Track and Field events (any one).	3
		Lay out knowledge and Officiating ability-	20	2	Games: Football, Kabaddi, Kho-Kho and Volleyball (any one).	4

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-2 (January-Jun), Corse Code- CC1B, SESSION: 2022-2023,

CORE PAPER- 2: Management of Physical Education and Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Unit- I:		1.1	Concept and definition of Sports Management.	4
				1.2	Important of Sports Management.	3
			10	1.3	Purpose of Sports Management.	3
2. MUHAMM ALI SAIKH				1.4	Principles of Sports Management.	3
	MUHAMMAD					
	ALI SAIKH	Unit- III: Facilities and Equipment		3.1	Method of calculation of Standard Athletic Track marking.	2
			10	3.2	Care and maintenance of play ground and gymnasium.	3
				3.3	Importance, care and maintenance of sports Equipment.	3
				3.4	Time Table: Meaning, importance and factors affecting school's physical education Time Table.	3
		INTERNAL ASSESSMENT	15	1	Internal assessment & class attendance	3

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2022-2023,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER		SYLLABUS	CLASS
		Unit- II: Health Problems in		2.1	Communicable Diarrhoea.	e Diseases- Malaria, Dengue and Chicken Pox and	3
		India- Prevention and Control	10	2.2	Non-communi Asthma.	cable Diseases- Obesity, Diabetes and AIDS,	2
				2.3	Nutrition- Nut Health disorde	ritional requirements for daily living. Balance Diet. ers due to deficiencies of Vitamins and Minerals.	3
				2.4	Postural defor Lordosis, Scolie	mities- Causes and corrective exercise of Kyphosis, osis, Knock Knees and Flat Foot.	3
1.		Unit- IV: Health and First-aid	10	4.1	First aid- Mear First-aid.	ning, definition, importance and golden rules of	3
		Management	10	4.2	Concept of spo Dislocation.	orts injuries- Sprain, Strain, Facture and	3
				4.3	Management of therapy and Ther	of sports injuries through the application of Hydro- nermo- therapy.	3
	PRAC			4.4	Management o Exercise and N	of sports injuries through the application of lassage therapy.	3
		PRACTICAL	20	1.	First-aid Pract & Cuff Sling), R Figure of Eight	First-aid Practical- Triangular Bandage: Slings (Arm Sling, Collar & Cuff Sling), Roller Bandages: Simple Spiral, Reverse Spiral, Figure of Eight, Spica.	
					Practical know	2	
		SEC2: UNIT-3 & 4: Asanas &	20	3.1	Standing Position	3.1.1 Ardhachandrasana, 3.1.2 Brikshasana, 3.1.3 Padahastasana	1
		Pranayama (any two)		3.2	Sitting Position	3.2.1Ardhakurmasana, 3.2.2 Paschimottanasana 3.2.3Gomukhasana	1
		SEC2: UNIT-3 & 4:		3.3	Supine Position	3.3.1Setubandhasana, 3.3.2 Halasana, 3.3.3Matsyasana	1
		Asanas & Pranayama (any		3.4	Prone Position	3.4.1 Bhujangasana, 3.4.2 Salvasana, 3.4.3 Dhanurasana	1
		two)		3.5	Inverted Position	3.5.1 Sarbangasana, 3.5.2 Shirsasana, 3.5.3 Bhagrasana	1
				1.	Pranayama (any two)	4.1 Kapalbhati, 4.2 Bhramri, 4.3 Anulam Vilom	1

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-4, (January-Jun), Corse Code- CC1D, & SEC2, SESSION: 2022-2023,

SUBJECT: CORE PAPER- 4: Health Education, Physical Fitness and Wellness

SEC2: Gymnastics and Yoga

S.L	TEACHER	UNIT	MARKS	CHAP	SYLLABUS	CLASS
NO.	NAME			IER		
		Unit- I:		1.1	Concept, definition and dimension of Health.	3
	MUHAMMAD ALI SAIKH		10	1.2	Definition, aim, objectives and principles of Health Education.	2
				1.3	Health Agencies- World Health Organization (WHO), United Nations Educational Scientific and Cultural Organization (UNESCO).	3
2.				1.4	School Health Program- Health Service, Health Instruction, Health Supervision, Health appraisal and Health Record.	3
		Unit- III: Physical Fitness and Wollnoss	ıl 10	3.1	Physical Fitness- Meaning, definition and Importance of Physical Fitness.	3
		weiness		3.2	Components of Physical Fitness- Health and Performance related Physical Fitness.	3
				3.3	Concept of Wellness. Relationship between Physical activities and Wellness.	2
				3.4	Ageing- Physical activities and its importance	2
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1
		SEC2: UNIT-1 & 2:	20	1	1.1 Forward Roll, 1.1 T-Balance, 1.1 Forward Roll with Split leg,	2
		GYMNASTICS			1.1 Backward Roll, 1.1 Cart-Wheel	
		SEC1: INTERNAL ASSESSMENT	10	2	2.1 Dive and Forward Roll, 2.2 Hand Spring, 2.3 Head Spring, 2.4 Neck Spring,	2
					2.5 Hand Stand and Forward Roll, 2.6 Summersault	

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-6, (January-Jun), Corse Code- DSE 1B, SESSION: 2022-2023,

SUBJECT: Psychology in Physical Education and Sports

S.L	TEACHER	UNIT	MARKS	СНАР	SYLLABUS	CLASS
NO.	NAME			TER		
		Unit- I: Introduction		1.1	Meaning and definition Psychology.	2
			10	1.2	Importance and scope of Psychology.	3
				1.3	Meaning and definition Sports Psychology.	2
				1.4	Need for knowledge of Sports Psychology in the field of Physical Education.	2
		Unit- IV: Stress and Anxiety	10	4.1	Stress- Meaning, definition and types of Stress.	3
1.				4.2	Causes of Stress.	3
				4.3	Anxiety- Meaning, definition and types of Anxiety.	2
				4.4	Management of Stress and Anxiety through physical activity and sports.	3
		INTERNAL ASSESSMENT	15	1	Internal Assessment & class attendance	1

Head of the Department Dept of Physical Education Dumkal College, Murshidabad

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Principal Dumkal College, Basantapur Murshidabad, W.B.

DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-6, (January-Jun), SEC4, SESSION: 2022-2023,

SUBJECT: SEC4: BALL GAMES (Any two)

S.L	TEACHER NAME	UNIT	MARKS	CHAPTER	SYLLABUS	CLASS
NO.						
		SEC4: BALL GAMES (Any two). FOOTBALL	20	1.	Kicking: Kicking the ball with inside of the foot, Kicking the ball with Full Instep of the foot, Kicking the ball with Inner Instep of the foot, Kicking the ball with Outer Instep of the foot and Lofted Kick.	3
		A. Fundamental skills		2.	Trapping: Trapping- the Rolling ball, and the Bouncing ball with sole of the foot.	2
				3.	Dribbling: Dribbling the ball with Instep of the foot, Dribbling the ball with Inner and Outer Instep of the foot.	2
				4.	Heading: In standing, running and jumping condition.	2
				5.	Throw-in: Standing throw-in and Running throw-in.	3
1.	MD TOSOF ALI			6.	Feinting: With the lower limb and upper part of the body.	2
				7	Tackling: Simple Tackling, Slide Tackling.	2
				8	Goal Keeping: Collection of Ball, Ball clearance- kicking, throwing and deflecting.	3
				9	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	3
		HANDBALL		1.	Catching, Throwing and Ball control,	2
				2.	Goal Throws: Jump shot, Center shot, Dive shot, Reverse shot.	2
		A. Fundamental Skills		3.	Dribbling: High and low.	2
				4.	Attack and counter attack, simple counter attack, counter attack from two wings and center.	2
				5.	Blocking, GoalKeeping and Defensive skills.	2
				6.	Game practice with application of Rules and Regulations.	2
				В.	Rules and their interpretation and duties of officials.	2
		BASKETBALL A. Fundamental Skills		1.	Passing: Two hand Chest Pass, Two hands Bounce Pass, One hand Baseball Pass, Side arm Pass, Overhead Pass, Hook Pass.	2
				2.	Receiving: Two hand receiving, One hand receiving, Receiving in stationary position, Receiving while Jumping and Receiving while Running.	2
				3.	Dribbling: How to start dribble, drop dribble, High Dribble, Low Dribble, Reverse Dribble, Rolling Dribble.	2
				4.	Shooting: Lay-up shot and its variations, One hand set shot, Two hands jump shot, Hook shot, Free Throw.	2
				5.	Rebounding: Defensive rebound and Offensive rebound.	2
				6.	Individual Defence: Guarding the player with the ball and without the ball, Pivoting.	2

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		7.	Game practice with application of Rules and Regulations.	2
		В.	Rules and their interpretation and duties of officials.	2

DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-6, (January-Jun), Corse Code- DSE1B, SESSION: 2022-2023,

SUBJECT: Psychology in Physical Education and Sports

S.L NO.	TEACHER NAME	UNIT	MARKS	CHAP TER	SYLLABUS	CLASS
		Unit- II: Learning		2.1	Meaning and definition of learning.	2
			10	2.2	Theories of learning and Laws of learning.	2
			10	2.3	Learning curve: Meaning and Types.	3
				2.4	Transfer of learning- Meaning, definition type and factors affecting transfer of learning.	3
2.	MUHAMMAD ALI SAIKH	Unit- III: Psychological	10	3.1	Motivation- Meaning, definition, type and importance of Motivation in Physical Education and Sports.	2
		Factors		3.2	Emotion- Meaning, definition, type and importance of Emotion in Physical Education and Sports.	3
				3.3	Personality- Meaning, definition and type Personality traits.	3
				3.4	Role of physical activities in the development of personality.	2
		PRACTICAL	20	1.	Assessment of Personality, Stress and Anxiety (any one)	2
				2.	Measurement of Reaction Time, Depth Perception and Mirror Drawing (any one).	2

Head of the Department Dept of Physical Education Dumkal College, Murshidabad

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DEPARTMENT OF PHYSICAL EDUCATION

DUMKAL COLLEGE

SEMESTER-6, (January-Jun), SEC4, SESSION: 2022-2023,

SUBJECT: SEC4: BALL GAMES (Any two)

S.L	TEACHER NAME	UNIT	MAR	CHAPT	SYLLABUS	CLASS
NO.			KS	ER		
		SEC4: BALL GAMES (Any two).	20	1.	Service: Under arm service, Side arm service, Tennis service, Floating service.	3
		VOLLEYBALL		2.	Pass: Under arm pass, Over head pass.	2
		A. Fundamental skills		3.	Spiking and Blocking.	2
				4.	Game practice with application of Rules and Regulations.	3
2.	MUHAMMAD ALI			5.	Rules and their interpretation and duties of officials.	2
	SAIKH	NETBALL A. Fundamental Skills		1.	Catching: one handed, two handed, with feet grounded and in flight.	2
				2.	Throwing (Different passes and their uses): One hand passes (shoulder, high shoulder, underarm, bounce, lob), two hand passes (Push, overhead and bounce).	3
				3.	Footwork: Landing on one foot, landing on two feet, Pivot, Running pass.	3
				4.	Shooting: One hand, forward step shot, and backward step shot.	2
				5.	Techniques of free dodge and sprint, sudden sprint, sprint and stop, sprinting with change at speed.	3
				6.	Defending: Marking the player, marking the ball, blocking, inside the circle,	2
					outside the circle. Defending the circle edge against the passing.	
				7.	Intercepting: Pass and shot.	2
				8.	Game practice with application of Rules and Regulations.	3
				В.	Rules and their interpretation and duties of officials.	2
		THROWBALL A. Fundamental Skills		1.	Overhand service, Side arm service, two hand catching, one hand overhead return, side arm return.	3
				2.	Rules and their interpretations and duties of officials.	2
		INTERNAL ASSESSMENT	10	1	Internal Assessment & class attendance	1

Head of the Department Dept of Physical Education Dumkal College, Murshidabad

5002. Principal Dumkal College, Basantapur Murshidabad, W.B.

Department of Computer Science Syllabus Distribution for the academic session 2022-23 B.Sc. Honours. in Computer Science

Vear	SE	Damas	Name	of the T	eacher- Sadekul Islam(SI)	
/Part	M	Paper	Marks - Theory(T) /Practical(P)	Group	Title	Credit
111	1	CCI	40-T	Α	Computer Fundamental and Programming using C	4
			20-P	В	Programming using C. Lab	2
		CC2	40-T	Α	Digital System Design	4
		CEL	20-P	В	Digital System Design Lab	2
		GEI	40-T	۸	Computer Fundamental and Programming using C	4
		0.00	20-P	В	Programming using C Lab	2
	- 11	CC3	40-T	A	Programming in C++	4
			20-P		Programming in C++ Lab	2
		CC4	60-T	A	Computer System Architecture	6
		GE2	40-T	A	Database Management Systems	4
	1		20-P	В	Database Management Systems Lab	2
2	m	CC5	40-T	A	Data Structures	4
			20-P	В	Data Structures Lab	2
		CC6	40-T	A	Design and Analysis of Algorithms	4
			20-P	в	Design and Analysis of Algorithms Lab	2
		CC7	40-T	A	Discrete Structures	6
		GE1	40-T	A	Computer Fundamental and Programming using C	4
			·20-P	В	Programming using C. Lab	2
	IV	CC8	. 60-T	A	Operating System	6
		CC9	60-T	A	Computer Networks	6
		CC10	40-T	A	Database Management Systems	4
1			20-P	В	Database Management Systems Lab	2
		GE2	40-T	A	Database Management Systems	4
			20-P	В	Database Management Systems Lab	2
3	V	CCII	60-T	A	Theory of Computation	6
- 13		CC12	40-T	A	Internet Technologies	4
- 4			20-P	В	Internet Technologies LAB	2
		DSE1	40-T	A	Microprocessor/ Digital Image Processing	6
		Town of the	20-T	B	Microprocessor/ Digital Image Processing Lab	
		DSE2	40-T	Α	Numerical Methods/ Machine Learning	4
12	(Real		20-P	в	Numerical Methods/ Machine Learning Lab	2
1000	VI	CC13	60-T	Α	Software Engineering	6
	-	CC14	·40-T ·	А	Computer Graphics 1	4
	236		20-T	В	Computer Graphics Lab	2
	2	DDSE3	40-T	A	System Programming/Introduction to Data Science	4
- 1		NAL C	20-P	B	System Programming/Introduction to Data Science Lab	2
		DSE4	60-p	A	Project Work/Dissertation	6

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Head of the Department Dept of Computer Science Dumkal College, Murshidabad

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Department of Computer Science Syllabus Distribution for the academic session 2021-22 B.Sc. Honours. in Computer Science

	1		Name	of the T	eacher- Sadekul Islam(SI)	
Year /Part	SE M	Paper	Marks - Theory(T) /Practical(P)	Group	Title	Credit
1	1	CC1	40-T	A	Computer Fundamental and Programming using C	4
	1 8	1	20-P	В	Programming using C Lab	2
		CC2	40-T	A	Digital System Design	4
	1 6		20-P	В	Digital System Design Lab	2
		GEI	40-T	Α	Computer Fundamental and Programming using C	4
	1		20-P	В	Programming using C Lab .	2
	11.2	CC3	. 40-T	A	Programming in C++	4
		5-05430 a	20-P		Programming in C++ Lab	2
	1 1	CC4	60-T	A	Computer System Architecture	6
		GE2	40-T	A	Database Management Systems	4
		0.010104	20-P	В	Database Management Systems Lab	2
2	ш	CC5	40-T	A	Data Structures	4
			20-P	В	Data Structures Lab	2
		CC6	40-T	A	Design and Analysis of Algorithms	4
			20-P	В	Design and Analysis of Algorithms Lab	2
	1 1	CC7	40-T	A	Discrete Structures	6
		GEI	40-T	A	Computer Fundamental and Programming using C	4
	1		20-P	В	Programming using C Lab	2
	IV	CC8	60-T	A	Operating System	6
	1	CC9	60-T	A	Computer Networks	6
	1 6	CC10	40-T	A	Database Management Systems	4
		core	20-P	B	Database Management Systems Lab !	2
	6 6	GE2	40-T	A	Database Management Systems	4
		SNEW COL	20-P	В	Database Management Systems Lab	2
3	V	CCII	60-T	A	Theory of Computation	6
	1	CC12	40-T	A	Internet Technologies	4
		0012	20-P	В	Internet Technologies LAB	2
		DSEL	40-T	A	Microprocessor/ Digital Image Processing	6
	the state	DSEI	20-T	B	Microprocessor/ Digital Image Processing Lab	
		DSE2	40-T	A	Numerical Methods/ Machine Learning	4
			20-P	В	Numerical Methods/ Machine Learning Lab	2
	VI	CC13	60-T	A	Software Engineering	6
	1000	CC14	40-T	A	Computer Graphics	4
		and country of	20-T	В	Computer Graphics Lab	2
		DDSE3	40-T	A	System Programming/Introduction to Data Science	4
		00363	·20-P .	В	System Programming/Introduction to Data Science Lab	2
		DSEA	· 60-p	A	Project Work/Dissertation	6

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Head of the Department Dept. of Computer Science Dumkal College, Murshidabad

Department of Computer Science Syllabus Distribution for the academic session 2020-21 B.Sc. Honours. in Computer Science

'ear	SE	Paper	Marke Thomas (11)	or the r	cacher- Sauerui Istain(SI)	0.0
Part	M	raper	/Practical(P)	Group	Title	Credit
1	1	CCI	40-T	٨	Computer Fundamental and Programming using C	4
			20-P	в	Programming using C Lab	2
		CC2	40-T	Α	Digital System Design	4
		-	20-P	В	Digital System Design Lab	2
		GEI	40-T	٨	Computer Fundamental and Programming using C	4
	-		20-P	В	Programming using C Lab	2
	11	CC3	40-T	Α	Programming in C++	4
			20-P		Programming in C++ Lab	2
		CC4	60-T	Α	Computer System Architecture	6
		GE2	· '40-T	A	Database Management Systems 1	4
			20-P	В	Database Management Systems Lab	2
	111	CC5	40-T	A	Data Structures	4
			20-P	В	Data Structures Lab	2
		CC6	40-T	Α	Design and Analysis of Algorithms	4
	8	Consider 1	20-P	В	Design and Analysis of Algorithms Lab	2
		CC7	40-T	Α	Discrete Structures	6
		GE1	40-T	A	Computer Fundamental and	4
			20-P	В	Programming using C Lab	2
	IV	CCS	60-T	A	Operating System	6
	100	CC9	60-T	A	Computer Networks	6
		CCIO	40-T	Δ.	Database Management Systems	4
		cero	20-P	B	Database Management Systems Lab	2
		GE2	40-T	A	Database Management Systems	4
		1 100000	20-P	B	Database Management Systems Lab	2
-	V	CCII	-60-T.	A	Theory of Computation	6
		CC12	40-T	A	Internet Technologies	4
			20-P	в	Internet Technologies LAB	2
		DSEI	40-T	A	Microprocessor/ Digital Image Processing	6
		705-586 3	20-T	в	Microprocessor/ Digital Image Processing Lab	
		DSE2	40-T	A	Numerical Methods/ Machine Learning	4
		Section 1	20-P	В	Numerical Methods/ Machine Learning Lab	2
1	VI	CC13	60-T	A	Software Engineering	6
1	-	CC14	40-T	А	Computer Graphics	4
			20-T	В	Computer Graphics Lab	2
1	-	DDSE3	40-T	A	System Programming/Introduction to Data Science	4
	-	15124635477.02	20-P	В	System Programming/Introduction to Data Science Lab	2
1		DSE4	60-p	A	Project Work/Dissertation	6

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Head of the Department Dept. of Computer Science Dumkal College, Murshidabad

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Department of Computer Science Syllabus Distribution for the academic session 2019-20 B.Sc. Honours. in Computer Science

Valley of the	2012/04/04	Paper	Marks -Theory(T)	Group	Title	Credi	
/Part	M		/Practical(P)	Circup	The	cicui	
1		CC1	40-T	Α	Computer Fundamental and Programming using C	4	
			20-P	В	Programming using C Lab	2	
		CC2	40-T	Α	Digital System Design	4	
			20-P	В	Digital System Design Lab	2	
			GE1	40-T	A	Computer Fundamental and Programming using C	4
			20-P	В	Programming using C Lab	2	
	11	CC3	40-T	A	Programming in C++	4	
			20-P		Programming in C++ Lab	2	
	1	CC4		A	Computer System Architecture	6	
	ं	GE2		Δ	Database Management Systems	4	
		OE2	20-P	B	Database Management Systems Lab	2	
					Duniouserrang	4	
2 1	111	CC5	40-T	A	Data Structures	2	
	19-102-5		20-P	В	Data Structures Lab	4	
		CC6	40-T	A	Design and Analysis of Algorithms Design and Analysis of Algorithms Lab	2	
			20-P		Disagte Characterite	6	
_		CC7	40-T	A	Discrete Structures	4	
2		GEI	40-T	Α	Programming using C	2	
			20-P	В	Programming using C Lab	4	
	N.	CC8	60-T	A	Operating System	6	
	12	CC9	60-T	A	Computer Networks	0	
		0010	40-T	A	Database Management Systems	1 7	
		CCIV	20-9	В	Database Management Systems Lab	4	
		CE2	.40-T	A	Database Management Systems	2	
		062	20-P	В	Database Management Systems Lab	1 2	
		100	80-T	A	Graph Theory	2	
3		vii		В	Discrete Mathetical Structures	2	
	1.002	1000		C	Numerical Optimization Techniques	2	
	SHU I			D	Formal Language and Automata Theory	2	
		VIII	80-T	٨	Graphics Oceanization-II	2	
				B	Computer Organization & Computer Network, Internet Technology	2	
	-	1 - 4 - 2	and the second second	0	Software Engineering	2	
		IX	80-T	A	Data Base Management System	2	
	1	200		B	Sustem Software		
		2-1-1-1-1		C	RDRMS		
		X	80-P	A	Unix Shell Programming		

Sadeku) Islam

Head of the Department Dept of Computer Science Dumkal College, Murshidabad

Department of Computer Science Syllabus Distribution for the academic session 2018-19 B.Sc. Honours. in Computer Science

			Name	of the T	eacher- Sadekul Islam(SI)			
r r /Part	E M	Paper	Marks - Theory(T) /Practical(P)	Group	Title	Credit		
1	1	CC1	40-T	А	Computer Fundamental and Programming using C	4		
			20-P	В	Programming using C Lab	2		
		CC2	40-T	Α	Digital System Design	4		
			20-P	В	Digital System Design Lab	2		
		GE1	40-T	Α	Computer Fundamental and Programming using C	4		
			20-P	В	Programming using C Lab	2		
	11	CC3	40-T	Α	Programming in C++	4		
			20-P	В	Programming in C++ Lab	2		
		CC4	60-T	А	Computer System Architecture	6		
		GE2	40-T	A	Database Management Systems	4		
		e 11 S	· 20-P · · ·	В	Database Management Systems Lab	2		
2	1	IV	50-T	Α	Computer Organization-I	4		
				В	Microprocessor	2		
		V 50-T	V	V 50-T	50-T	Α	Data Structures	4
				В	Object Oriented Programming	2		
		VI	VI 100-P	Α	Hardware: Microprocessor	3		
				В	Software: Object Oriented Programming	3		
3		VII	80-T	А	Graph Theory	2		
				В	Discrete Mathetical Structures	2		
				С	Numerical Optimization Techniques	2		
				D	Formal Language and Automata Theory	2		
		VIII	80-T	Α	Graphics	2		
				В	Computer Organization-II	2		
				С	Data Communication & Computer Network, Internet Technology	2		
	t	. IX	· 80-T · · ·	Α	Software Engineering • 1	2		
				В	Data Base Management System	2		
	1			С	System Software	2		
	T	X	80-P	A	RDBMS	3		
		ALC: NO		В	Unix Shell Programming	3		
	t	XI	80-P	A	Project	6		

Sadeka) Islam

Head of the Department Dept of Computer Science Dumkal College, Murshidabad

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NAME OF TEACHER	Year	PAPER	CONTENT
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		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (কাবা)
Achintya Kumar	Part-I	Paper -2	অলংকার
Gangopadnyay		Paper -2	বৈষঃৰ পদাৰলী
		Paper -1	সাহিত্যের ইতিহাস মধ্যযুগ (মঙ্গগকাব্য)
		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (উপন্যাস, ঘেটগল্প)
Soma Karmakar	Part-I	Paper -1	ভাষাতন্ত্র (পর্ব- ঝ,এঃ, ট, ঠ)
		Paper -2	রামায়ণ
		Paper -1	সাহিত্যের ইতিহাস প্রাচীন যুগ (আরাকান সাহিত্য, শান্ড পদাবলী)
		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (নাটক ও সাময়িক পত্র)
Jahangir Hussein	Part-I	Paper -1	ভাষাতত্ত্ব (পৰ্ব- ক, খ, গ,ম)
2	-	Paper -2	ছন্দ
		Paper -1	সাহিত্যের ইতিহাস প্রাচীন যুথ (অনুবাদ সাহিত্য, জীবনী সাহিত্য)
		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (গদ্য ও প্রবন্ধ)
Rabiul Hague	Part-I	Paper -1	ভাষাতন্ত্র (পর্ব- ৪, চ, ছ,জ)
		Paper - 2	ব্যয়দামঞ্চল

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Achintya Kumar Gangopadhyay	Part-II	Paper- 4	নির্বাচিত সমালোচনা সংকলন (পর্ব- গ)
		Paper- 3	ঘরে বাইরে
		Paper- 4	প্রবন্ধ সাহিত্যের রপচেদ
Soma Karmakar	Part-II	Paper- 4	প্রবন্ধ সঞ্চলন (পর্ব-ড)
		Paper- 3	গৃহদাহ
Jahangir Hussein	Part-II	Paper- 4	নিৰ্বাচিত প্ৰবন্ধ (পৰ্ব –খ)
		Paper- 3	কথাসাহিত্যের রূপজেদ
Rabiul Hague	Part-II	Paper- 3	গল্পজন্ম
	-	Paper- 4	পালামৌ

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		Paper- 6	অপুনিক কৰিচা
Achintya Kumar Gangopadhyay	Part-III	Paper- 6	फिया
		Paper- 7	<u> উলেকেটাৰ সেশাই</u>
		Paper- 8	ইংরজি সহিত্যের ইতিহাস
		Paper- 8	জন্ম ভিজ্ঞাসা
		Paper- 8	কাৰস্টেন্সৰ্য বিচাৰ
		Paper- 5	Taki
		Paper- 6	ৰাহেৰা শ্ৰপনিতি
Soma Karmakar	Part-III	Paper- 6	हेल्ला
		Paper- 7	eli
		Paper-8	लाकारिस
		Paper-5	eram o fundinas era
		Paper- 5	र्वत्र शाहल
Jahongir Hussein	Part-III	Paper- 6	rfeat
		Paper- 7	ગાસ્ટ નીડારી
		Paper- 8	সহিলেজ পাস
		Paper- 8	সহিতেল নাইজগ
		Paper- 5	নাহতত রগ্যাঁত
		Paper- 6	8544
tabiul Hague	Part-III	Paper- 7	অন্যদোন অধিকান
		Paper- 7	অধুনিক গয
		Paper - B	সংস্ত সহিবের ইতিহাস

Alto In Anthonyon Sumar Ganguly Dr. Achineya Sumar Ganguly Hasa af the Department in Bungan DUMKAL COLLEGE DUMKAL COLLEGE



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		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (কাবা)
Dr. Achintya Kumar	Part-I	Paper -2	অলংকার
Gangopadnyay		Paper -2	বৈষঃব পদাবলী
		Paper -1	সাহিত্যের ইতিহাস মধ্যযুগ (মঙ্গগকাব্য)
		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (উপন্যাস, ছোটগল্প)
Soma Karmakar	Part-I	Paper -1	ভাষাতন্তু (পর্ব- ঝ,এঃ, ট, ঠ)
		Paper -2	রামায়ণ
		Paper -1	সাহিত্যের ইতিহাস প্রাচীন যুগ (আরাকান সাহিত্য, শান্ড পদাবলী)
		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (নাটক ও সাময়িক পত্র)
Jahangir Hussein	Part-I	Paper -1	ভাষাতত্ত্ব (পর্ব- ক, খ, গ,য)
	-	Paper -2	ছন্দ
		Paper -1	সাহিত্যের ইতিহাস প্রাচীন যুথ (অনুবাদ সাহিত্য, জীবনী সাহিত্য)
-		Paper -1	সাহিত্যের ইতিহাস আধুনিক যুগ (গদ্য ও প্রবন্ধ)
Rabiul Hague	Part-I	Paper -1	ভাষাতন্ত্ব (পর্ব- গু, চ, ছ,জ)
		Paper - 2	অয়দামঙ্গল

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Dr. Achintya Kumar Gangopadhyay	Part-II	Paper- 4	নির্বাচিত সমালোচনা সংকলন (পর্ব- গ)
		Paper- 3	খরে বাইরে
	-	Paper- 4	প্রবন্ধ সাহিত্যের রপডেদ
Soma Karmakar	Part-II	Paper- 4	গ্রবন্ধ সন্ধলন (পর্ব-ড)
		Paper- 3	গৃহদাহ
Jahangir Hussein	Part-II	Paper- 4	নির্বাচিত প্রবন্ধ (পর্ব -খ)
		Paper- 3	কথাসাহিত্যের রূপভেন
Rabiul Hague	Part-II	Paper- 3	গর্ভচ্চ
		Paper- 4	পালামৌ

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0r. Achintya Kumar	Part-III	Paper- 6	াচরা
and a barren barr		Paper- 7	চিলেকেইল সেপাই
		Paper- 8	ইংরজি সহিচেত্র ইতিবাস
		Paper- 8	কাৰা জিল্পান
		Paper- 8	কানচেশীন্দর্য বিচার
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		Paper- 6	সায়ের জনইবির
ioma Karmakar	Part-III	Paper- 6	मेहमा
		Paper- 7	शरि
		Paper- 8	লাকবহিয়
		Paper- 5	লম্মৰ ও নিয়াইকের ভাল
		Paper- 5	খুবচাহান
ahangir Hussein	Part-III	Paper- 6	সন্ধিয
		Paper- 7	শহন্য পালগ
		Paper-8	স্থিয়েয় পাল
		Paper- 8	সহিলেন নটিলগ
		Paper- 5	गरिक वन्त्रीह
		Paper- 6	चाहरूना
labiul Hague	Part-HI	Paper- 7	অরদের অনিকার
		Paper- 7	আধুনিক গল্প
		Paper - 0	সংস্কৃত সহিলোর ইতিহাস

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Soma Karmakar	Part-II	Paper- 4	গ্রবন্ধ সন্ধলন (পর্ব-ড)
	-	Paper- 3	গৃহলাহ
Tamal Kanti Pal	Part-II	Paper- 4	নিৰ্বাচিত প্ৰবন্ধ (পৰ্ব –খ)
		Paper- 3	কথাসাহিত্যের রূপভেন
Motiur Blswas	Part-II	Paper- 3	গরওয়ে
Rejuanur Jaman Shah	Part-II	Paper- 4	প্রবন্ধ সাহিত্যের রুপণ্ডেদ
	_	Paper- 4	পালামৌ

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		Paper- 6	আবুনিক কবিৱা
Dr. Achintya Kumar Gangopadhyay	Part-III	Paper 7	চিলোকোরার দেশাই
		Paper- 8	ইংৰলি সহিতেৰে ইডিযাদ
		Paper- 8	কান্য জিজাসা
		Paper- 6	কাকের রূপরীতি
ioma Karmakar	Part-III	Paper- 6	रीत्रज्ञन
		Paper- 7	কবি
		Paper- 8	গোকসহিত্য
	-	Paper- 8	কান্যসৌন্দর্য বিভার
		Paper- 5	নালমক ও মিয়েটারের ধানা
		Paper- 5	ভাতমৰ
Famal Kanti Pal	Part-III	Paper- 6	অঞ্চলগ
		Paper- 8	সচিত্রের পথে
-		Paper- 5	গাটকের স্তপ্রাহি
		Paper 5	পুরজাবান
Notiur Biswas	Part-III	Paper- 6	গঞ্জিতা
	-	Paper- 7	শ্যসর পাঁচলী
	-	Paper- 8	সহিলের নাটারণ
		Paper- 6	fiar
lejuanur Jaman Shah	Part-III	Paper- 7	ফরাণার অধিকার
		Paper 7	অধুনিক পদ্ব
		Paper - 8	শংকৃত মহিতের ইতিহাম

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		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)
		BNG-H-CC-T-2	বাংলা সহিত্যের ইতিহাস
Dr. Achintya Kumar Gangopadhyay	1 st semester	BNG-H-GE-T-1	ৰাংলা সহিত্যের ইতিহাস (গাটন ৬ মধ্যয়গ)
		BNG-G-AECC-T-1	বাংলা
		BNG-H-CC-T-1	বাংলা ভাষাভত্ব (গ্রথম ভাগ)
		BNG-H-CC-T-2	বাংলা ভাষাতত্ব (মিতীয় ভ্রাণ)
Soma Karmakar	1 st semester	BNG-H-GE-T-1	हम
		BNG-G-CC-T-1	হন্দ ও অগস্থার
		BNG-G-AECC-T-1	ছোটপায়
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ)
		BNG-H-CC-T-2	ৰাংলা সাহিত্যের ইতিহাস (আধনিক যগ)
lamal Kanti Pal	1st semester	BNG-H-GE-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযগ)
		BNG-G-AECC-T-1	কবিতা
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধাযুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
Motiur Biswas	1st semester	BNG-H-GE-T-1	বৈষ্ণৰ পদাবলী
		BNG-G-CC-T-1	বৈষ্ণৰ পদাবলী
Rejanur Jaman Shah	1st semester	BNG-H-CC-T-1	বাংশাসাহিতোরইতিহাস (প্রাচীন ও যধাযুগ)
		BNG-H-CC-T-2	বাংগাসহিত্যেরইডিহাস

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		BNG-H-CC-T-4	অলক্ষ্যর
		BENG-H-AECC-T-1	বাংলা
Dr. Achintya Kumar Gangonadhyay	2 nd semester	BNG-H-GE-T-2	কাৰ্যকৰিতা
Gangopaunyay		BNG-G-CC-T-2	বাংলা সহিত্যের ইতিহাস
	-	BNG-H-CC-T-3	(আধুনিক যুগ) বৈশ্বৰ পদাবলী
		BNG-H-GE-T-2	ভাষ্যতথ্
Soma Karmakar	2nd semester	BNG-H-AECC-T-1	পর রচনা, প্রভিবেদন
		BNG-G-LCC-T-1	মেঘনাদবধ কাব্য
		BNG-G-CC-T-2	বাংশা ভাষাতন্ত্
		BNG-H-CC-T-3	কৃত্তিবাদী রামায়ণ
		BNG-H-CC-T-4	অগ্রদামসন
Tamal Kanti Pal	2nd	BNG-H-GE-T-2	উপন্যাস ও ছোটগয়
	seniester	BNG-H-AECC-T-1	য়োটগল্প ও কবিতা
	1	BNG-G-LCC-T-1	শান্ড শদাধলী
		BNG-H-CC-T-3	বৈশ্বৰ পদাবলী
	10	BNG-H-CC-T-4	শান্ড পদাবদী
Motiur Biswas	2nd	BNG-H-GE-T-2	সাময়িক পত্র ও নাটক
	semester	BNG-H-AECC-T-1	পরিভাষা
	_	BNG-G-CC-T-2	উপন্যাস, ছোটগল্প, সাময়িক পত্র ও নাটক
	10	BNG-H-CC-T-4	শান্ডপদাবলী
		BENG-H-GE-T-2	বাংলাসহিত্যেরইতিহাস

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Rejanur Jaman Shah	2nd semester	BENG-G-LCC-T-1	শান্ডপদাবলী	
		BENG-G-LCC-T-1	পথানদীরমাঝি	_
		BENG-G-CC-T-2	উপন্যাস ও ছোটগল্প	

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DEPARTMENT OF BENGALI

Distribution of Syllabus 2018-2019 Session (3rd SEMESTER)

		BNG-H-CC-T-6	ব্যাহ্মসিংহ
		BNG-H-GE-T-3	সহিত্যের ইতিহাস
Dr. Achintya Kumar	3 rd semester	BNG-H-SEC-T-1	ছোটগল্পের নাট্যরাপ ও গ্রন্থ পর্যালোচনা
Gangopaunyay		BNG-G-CC-T-3	জীবনশ্বৃতি
		BNG-G-SEC-T-1	হোটগল্পের নাট্যরূপ ও গ্রন্থপর্যালোচনা
		BNG-H-CC-T-5	ৰথসেইবেল রগজেন
		BNG-H-CC-T-6	ম্বে নাইনে
		BNG-H-CC-T-7	হাবক নিবছের রগজেন
Soma Karmakar	3rd semester	BNG-H-GE-T-1	इस
		BNG-H-SEC-T-1	ধানান বিদি, রাজ রিডিং এবং গ্রন্থ পর্যালোচনা
		BNG-G-CC-T-3	ষ্ঠাবনপুথি
		BNG-Q-SEC-T-1	বান্যন বিধি, প্রন্ফ সংশেষন
		BNG-H-CC-T-5	ত্রাধুনিক বাংলা ডেটগস্ত
		BNG-H-GE-T-1	বাংগা সহিংমের ইতিহাস (প্রাইন ও মধ্যযুগ)
Famal Kanti Pal	3rd semester	BNG-G-CC-T-3	ভয়নজাছনী
		BNG-G-SEC-T-1	ফবিতা ও নাটক পঠ
		BNG-H-CC-T-5	রবীন্দ্রনাথের মোটগল্প
		BNG-H-CC-T-6	শ্রীকান্দ্র (প্রথম গান)
		BNG-H-CC-T-7	আমার জীবন
Motiur Biswas	3rd semester	BNG-H-GE-T-1	रेतधन जनवनी
		BNG-G-CC-T-3	শানমৌ
		BNG-G-SEC-T-1	গ্রন্থ পর্যালোচনা
		BNG-H-CC-T-7	বামলাকান্তের দপ্তর
Rejanur Jaman Shah	3rd semester	Hereit and the second sec	
Rejanur Jaman Shah	3rd semester	BNG-G-CC-T-3	छीरती, आध्रछीरगी

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Principal Dumkal College, Basantapur Murshidabad, W.B.

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Distribution of Syllabus 2019-2020 Session (Part-III).

NAME OF TEACHER	Year	PAPER	CONTENT
		Paper- 5	এবং ইন্দ্রজিং
		Paper- 6	আধুনিক কবিৱা
Dr. Achintya Kumar Gangopadhyay	Part-III	Paper- 7	ডিলেকোঠার দেশাই
		Paper- 8	ইংরাজি সাহিজের ইতিহাস
	-	Paper-8	কাৰ্য জিজাসা
		Paper 6	কান্যের রূপরীতি
Soma Karmakar	Part-III	Paper- 6	বীরাঙ্গন
	1	Paper- 7	শ্ববি
	-	Paper- 8	গোকসাহিত্য
		Paper- 8	কাৰ্যসৌন্দৰ্য বিচর
		Paper 5	রসমঞ্চ ও বিয়েটারের ধারা
		Paper- 5	ভাৰমন্ত
Tamal Kanti Pal	Part-III	Paper- 6	অন্তকণ
		Paper- 8	সাহিজের গথে
	1	Paper- S	নাটকের রূপরীতি
	-	Paper 5	নুরহাহান
Metiur Blowas	Part-III	Paper- G	সঞ্চিত্য
	i i	Paper- 7	শধের শাঁচালী
		Paper- 8	সহিজের নামিকণ
		Paper-6	ाज्या
Rejuanur Jaman Shah	Part-III	Paper- 7	অরশ্যের অধিকার
		Paper- 7	बाहुमिक ग्रह्म
		Paper - II	নংস্কৃত সহিত্যের ইতিহাল

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DEPARTMENT OF BENGALI

Distribution of Syllabus 2019-2020 Session (1" SEMESTER)

NAME OF TEACHER	SEMESTER	PAPER	CONTENT
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)
		BNG-H-CC-T-2	বাংলা সহিত্যের ইতিহাস
Dr. Achintya Kumar Gangopadhyay Soma Karmakar	1 st semester	BNG-H-GE-T-1	ৰাংলা সহিত্যের ইতিহাস (গাটন ৬ মধ্যয়গ)
		BNG-G-AECC-T-1	বাংলা
		BNG-H-CC-T-1	বাংলা ভাষাভত্ব (গ্রথম ভাগ)
		BNG-H-CC-T-2	বাংলা ভাষাতত্ব (মিতীয় ভ্রাণ)
	1 st semester	BNG-H-GE-T-1	हम
		BNG-G-CC-T-1	হন্দ ও অগস্থার
		BNG-G-AECC-T-1	ছোটপায়
Tamal Kanti Pal Motiur Biswas		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ)
		BNG-H-CC-T-2	ৰাংলা সাহিত্যের ইতিহাস (আধনিক যগ)
	1st semester	BNG-H-GE-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযগ)
		BNG-G-AECC-T-1	কবিতা
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধাযুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
	1st semester	BNG-H-GE-T-1	বৈষ্ণৰ পদাবলী
		BNG-G-CC-T-1	বৈষ্ণৰ পদাবলী
Rejanur Jaman Shah	1st semester	BNG-H-CC-T-1	বাংশাসাহিতোরইতিহাস (প্রাচীন ও যধাযুগ)
		BNG-H-CC-T-2	বাংগাসহিত্যেরইডিহাস

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Distribution of Syllabus 2019-2020 Session (2nd SEMESTER)

		BNG-H-CC-T-4	অলম্বার
		BENG-H-AECC-T-1	বালো
Dr. Achintya Kumar Gangopadhyay	2 nd semester	BNG-H-GE-T-2	কাৰ্যকৰিয়া
		BNG-G-CC-T-2	বাংলা সহিত্যের ইতিহাস
		BNG-H-CC-T-3	(আব্রামক বুগা) বৈদ্ধব পদাবলী
	_	BNG-H-GE-T-2	aucod
Soma Karmakar	2nd semester	BNG-H-AECC-T-1	পত্র বচনা, প্রতিবেদন
		BNG-G-LCC-T-1	মেখনাদবধ কাৰা
		BNG-G-CC-T-2	বাংগ্য ভাষাভাষ্
		BNG-H-CC-T-3	কৃত্তিবাসী রামায়ণ
		BNG-H-CC-T-4	বহাগনালগ্
lamal Kanti Pal	2nd semester	BNG-H-GE-T-2	উপন্যান ও যোটগল্প
		BNG-H-AECC-T-1	জেটপল্প ক কৰিবা
		BNG-G-LCC-T-1	শ্বক পদকেন্দ্র
-	1	BNG-H-CC-T-3	বৈষ্ণৰ পদাৰ্শনী
		BNG-H-CC-T-4	শান্ড পদাবেদী
Motiur Biswas	2nd somester	BNG-H-GE-T-2	স্মধিক শত্র ও নাটক
		BNG-H-AECC-T-1	পরিভাষ্য
		BNG-G-CC-T-2	উপনাস, ছেটগ্য, সামচিক গ্যা ও নাটক
		BNG-H-CC-T-4	শাগুলদাবলী
		BENG-H-GE-T-2	বাংলাসহিচেরেইডিহাস
Rejanur Jaman Shah	2nd semester	BENG-G-LCC-T-1	শান্ড পদাবলী
		BENG-G-LCC-T-1	পরানদীরমারি
		BENG-G-CC-T-2	উপন্যাস ও ছোটগল্প

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Distribution of Syllabus 2019-2020 Session (3rd SEMESTER)

		BNG-H-CC-T-6	রাজসিংহ
		BNG-H-GE-T-3	সাহিত্যের ইতিহাস
Dr. Achintya Kumar	3rd	BNG-H-SEC-T-1	ছোটগল্পের নাট্যরূপ ও গ্রন্থ পর্যালোচনা
Gangopadnyay	semester	BNG-G-CC-T-3	জীবনশ্বৃতি
		BNG-G-SEC-T-1	ছোটগঞ্জের নাট্যরূপ ও গ্রন্থপর্যালোচনা
		BNG-H-CC-T-5	কথাসাহিত্যের রূপচেন
		BNG-H-CC-T-6	মরে বাইরে
		BNG-H-CC-T-7	গ্রবন্ধ নিবছের রূপতেদ
Soma Karmakar	3rd semester	BNG-H-GE-T-1	हम
		BNG-H-SEC-T-1	বানান বিধি, প্রফ রিডিং এবং গ্রন্থ পর্যলোচনা
		BNG-G-CC-T-3	র্জাবনস্থৃতি
		BNG-G-SEC-T-1	বানান বিধি, প্রনফ সংশোধন
	3rd semester	BNG-H-CC-T-5	আধুনিক বংলা ছোটগল্প
		BNG-H-GE-T-1	বাংলা সাহিজের ইতিহাস (প্রাচীন ও মধ্যযুগ)
Tamai Kanti Pal		BNG-G-CC-T-3	ভয়ণকাহিনী
		BNG-G-SEC-T-1	কৰিছা ও নাটক গাঁঠ
		BNG-H-CC-T-5	রবীন্দ্রনাথের হোটগঞ্জ
		BNG-H-CC-T-6	ন্তিকান্দ্র (প্রথম পর্ব)
		BNG-H-CC-T-7	व्यामारा औरन
Motiur Biswas	3rd semester	BNG-H-GE-T-1	বৈষ্ণৰ গদাবদী
		BNG-G-CC-T-3	পালামৌ
		BNG-G-SEC-T-1	গ্রন্থ পর্যলোচনা
		BNG-H-CC-T-7	কমলাকান্তের দণ্ডর
Rejanur Jaman Shah	3rd	BNG-G-CC-T-3	জীবনী, আয়্মজীবনী

Achiga Ja & JAg. Dr. Achineya Rumar Gang of the Department In DUMKAL COLLEG



Principal Dumkal College, Basantapur Murshidabad, W.B.

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Distribution of Syllabus 2019-2020 Session (4th SEMESTER)

		BNG-H-CC-T-8	রবীন্দ্রনাথের প্রবন্ধ
		BNG-H-CC-T-9	কাব্যের রপচ্চেদ ও কাব্যজিজাসা
Dr. Achintya Kumar Gangonadhyay	4th semester	BNG-H-GE-T-4	কাধ্য-কবিতা
		BNG-H-SEC-T-2	পৰ্ব- ৩
		BNG-G-CC-T-4	প্রবন্ধ
		BNG-G-SEC-T-2	পৰ্ব- ও
		BNG-H-CC-T-9	বীরাঙ্গন
		BNG-H-CC-T-10	গ্রাক্ চরিশ কবিতা
		BNG-H-SEC-T-2	গবেষণার রীঠি পদ্ধতি, সহিত্য বিষয়ক প্রবন্ধ রচনা
Soma Karmakar	4th	BNG-G-LCC-T-2	ছোটগল্প
	semester	BNG-H-CC-T-4	কপালকুওলা
		BNG-G-SEC-T-2	প্রতিবেদন ও বিজ্ঞাপন রহনা
		BNG-H-CC-T-8	বাংলা সমলোচনামূলক প্রবন্ধ
		BNG-H-CC-T-9	উন্নিংশ শতকের গীতিকবিতা সংকলন
		BNG-H-CC-T-10	সঞ্চিতা
Tamal Kanti Pal	4th semester	BNG-H-GE-T-2	সাহিত্যের ইতিহাস : গদা, প্রবন্ধ ও কাব্য কবিতা
		BNG-G-CC-T-4	একেই কি বলে সভাৱা
		BNG-G-SEC-T-2	সহিত্য বিষয়ক লবদ রচনা
		BNG-H-CC-T-9	কান্দের সংজ্ঞা ও রূপভেদ
Motiur Biswas		BNG-H-CC-T-10	উন্তর চরিশ বাংগা কবিতা
	10	BNG-H-GE-T-2	ভাষাতব্
	4th	BNG-G-LCC-T-2	ছাৰঘর
		BNG-G-CC-T-4	বাংলা হাবছ
		BNG-G-SEC-T-2	সঞ্চলেনা ও সংবাদ পাঠ
		BNG-H-CC-T-8	সমালোচনামূলক প্রবন্ধ
Rejanur Jaman Shah	4th semester	BNG-H-GE-T-4	উপন্যাস ও হোটগন্ধ

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Distribution of Syllabus 2020-2021 Session (1st SEMESTER)

NAME OF TEACHER	S EMESTER	PAPER	CONTENT
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধাযুগ)
		BNG-H-CC-T-2	বাংলা সহিত্যের ইতিহাস
Dr. Achintya Kumar Gangopadhyay	1 st somester	BNG-H-GE-T-1	বাংলা সহিত্যের ইতিহাস (প্রাচীন ও মধাযগ)
		BNG-G-AECC-T-1	বাংলা
		BNG-H-CC-T-1	ৰাংলা ভাষাতত্ব (প্ৰথম ডাগ)
		BNG-H-CC-T-2	বাংগা ভাষাতত্ত্ব (দিতীয় ভাগ)
Soma Karmakar	1** semester	BNG-H-GE-T-1	हम
		BNG-G-CC-T-1	হন্দ ও অলঙ্কার
		BNG-G-AECC-T-1	জেটগল্প
	1st semester	BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
famal Kanti Pal		BNG-H-GE-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধাযগ)
		BNG-G-AECC-T-1	ক্ষিতা
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধাযুগ)
		BNG-H-CC-T-2	ৰাংলা সাহিত্যের ইতিহাস (আধনিক যগ)
Motiur Biswas	1st semester	BNG-H-GE-T-1	বৈশ্বৰ পদাবলী
	1	BNG-G-CC-T-1	বৈঞ্চব পদাবলী
Rejanur Jaman Shah	1st semester	BNG-H-CC-T-1	বাংলাস্যহিত্যেরইতিহাস (প্রাচীন ও মধ্যমূল)
		BNG-H-CC-T-2	বাংলাসাহিত্যেরইভিহাস

Achiga the Softy. Dr. Achineyo Rumar Gang of the D DUMK KAL COLLE



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Distribution of Syllabus 2020-2021 Session (2nd SEMESTER)

		BNG-H-CC-T-4	थनहात
		BENG-H-AECC-T-1	বাংলা
ir. Achintya Kumar Gangopadhyay	2 ^{og} semester	BNG-H-GE-T-2	কাৰ্যক্ৰিয়
		BNG-G-CC-T-2	বাংগা সহিত্যের ইতিহাস
			(আধুনিক ঘুণ)
		BND-H-CC-T-3	বৈষ্ণৰ পদাবলী
		BN0-H-GE-T-2	ভাষাতর্
loma Karmakar	2nd semaster	BNG-H-AECC-T-1	পত্র রচনা, প্রতিবেদন
	÷	BNG-G-LCC-T-1	মেঘনাদৰখ কাৰ্য
		BNG-G-CC-T-2	ধাংশা ভাষাতত্ত্ব
		BNG-H-CC-T-3	কৃত্তিবাসী রামাচণ
		BNO-H-CC-T-4	ব্যাদামঙ্গণ
Famal Kanti Pal	2nd semaster	BNG-H-GE-T-2	উপনাস ও ছোটগয়
		BNG-H-AECC-T-1	হোটগল্প ও কবিতা
		BNG-G-LCC-T-1	শান্ড গদাবলী
		BHG-H-CC-T-3	বৈষ্ণৰ পদাবলী
		BNG-H-CC-T-4	শাক্ত গদাবনী
Notice Biswes	2nd semester	8H0H-06T-2	সাময়িক পত্র ও নটক
		BNG-H-AECO-T-1	পরিভাষা
		8NG-G-CC-T-2	উপন্যাস, ছেটপছ, সামহিক পর ও নাটক
		BNG-H-CC-T-4	শাক্তপদাবদী
		BENG-H-GE-T-2	বাংলাসহিত্যেরইতিহাস
Rejanur Jaman Shah	2nd semanter	BENG-G-LCC-T-1	শান্ডপদাবলী
		BENG-G-LCC-T-1	পর্যানদীরমর্হি
		BENG-G-CC-T-2	উপন্যাস ৫ ছোটগল্প

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Distribution of Syllabus 2020-2021 Session (3rd SEMESTER)

		BNG-H-CC-T-6	রাজসিংহ
		BNG-H-GE-T-3	সাহিত্যের ইতিহাস
Dr. Achintya Kumar Gangonadhuau	3rd	BNG-H-SEC-T-1	ছোটগল্পের নাটারাপ ও গ্রন্থ পর্যালোচনা
sangopeanyey	semester	BNG-G-CC-T-3	জীবনশ্তি
		BNG-G-SEC-T-1	ছোটগল্লের নাট্যরূপ ও গ্রন্থপর্যালোচনা
		BNG-H-CC-T-5	কথাসাহিত্যের রূপচেদ
		BNG-H-CC-T-6	মরে বাইরে
		BNG-H-CC-T-7	গ্রবন্ধ নিবন্ধের রাগতেদ
ioma Karmakar	3rd semester	BNG-H-GE-T-1	इ.स.
		BNG-H-SEC-T-1	বাদান বিধি, প্রুফ রিডিং এবং গ্রন্থ পর্যলোচনা
		BNG-G-CC-T-3	জীৱনপ্থতি
		BNG-G-SEC-T-1	বানান বিধি, প্রনঞ্চ সংশোধন
		BNG-H-CC-T-5	আধুনিক বাংলা ছোটগয়
		BNG-H-GE-T-1	ৰাংলা সাহিতোর ইতিহাস (প্রাচীন ও মধাযুগ)
Famal Kanti Pal	3rd semester	BNG-G-CC-T-3	জমণকাহিনী
		BNG-G-SEC-T-1	কলিয়া ও নাটক গাঠ
	10	BNG-H-CC-T-5	রবীন্দ্রনাথের হেউগল্ল
		BNG-H-CC-T-6	ষ্টাকান্দ্র (প্রথম পর্ব)
	1	BNG-H-CC-T-7	আমার জীবন
Motiur Biswas	3rd	BNG-H-GE-T-1	ৰৈষ্ণৰ পদ্যবলী
		BNG-G-CC-T-3	পালমৌ
		BNG-G-SEC-T-1	এছ পর্যালেচনা
		BNG-H-CC-T-7	কমলাকান্তের দণ্ডর
Rejanur Jaman Shah	3rd Semester	BNG-G-CC-T-3	জীবনী, আন্মজীবনী
		BNG-G-LCC-T-2	কবিতা

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Distribution of Syllabus 2020-2021 Session (4th SEMESTER)

		BNG-H-CC-T-8	রবীন্দ্রনাথের প্রবন্ধ
		BNG-H-CC-T-9	কাব্যের রপন্তেদ ও কাব্যজিজ্ঞাসা
Dr. Achintya Kumar Gangopadhyay	4th	BNG-H-GE-T-4	কাধ্য-কবিতা
		BNG-H-SEC-T-2	পৰ্ব- ৩
		BNG-G-CC-T-4	প্রবন্ধ
		BNG-G-SEC-T-2	পর্ব- ও
		BNG-H-CC-T-9	বাঁরাঙ্গন
		BNG-H-CC-T-10	গ্রাক চল্লিশ কবিতা
		BNG-H-SEC-T-2	গবেষণার রীতি পদ্ধতি, সাহিত্য বিষয়ক গ্রবন্ধ রালা
Soma Karmakar	4th	BNG-G-LCC-T-2	ছোটগস্ক
		BNG-H-CC-T-4	ষপালকুওনা
		BNG-G-SEC-T-2	প্রতিবেদন ও বিজ্ঞাপন রচনা
		BNG-H-CC-T-8	বালো সমলোচনামূলক প্ৰবন্ধ
		BNG-H-CC-T-9	উনবিংশ শতকের গীতিকবিতা সংকলন
	4th semester	BNG-H-CC-T-10	সঞ্চাইতা
Tamal Kanti Pal		BNG-H-GE-T-2	সাহিত্যের ইতিহাস : গদা, প্রবন্ধ ও কাব্য-কবিতা
		BNG-G-CC-T-4	একেই কি বলে সভাতা
		BNG-G-SEC-T-2	সহিত্য বিষয়ক প্রবন্ধ রচনা
		BNG-H-CC-T-9	কার্যের সংজ্ঞা ও রূপভেন
		BNG-H-CC-T-10	উত্তর চল্লিশ বাংগা কবিতা
		BNG-H-GE-T-2	চামারত্ব
Motiur Biswas	4th	BNG-G-LCC-T-2	ভাৰমহ
		BNG-G-CC-T-4	বাংশা প্রবন্ধ
	1	BNG-G-SEC-T-2	সম্বর্গদা ও সংবাস পাঠ
		BNG-H-CC-T-8	সমালোচনামূলক প্রবন্ধ
Rejanur Jaman Shah	4th semester	BNG-H-GE-T-4	উপন্যাস ও ছোটগল্প

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Distribution of Syllabus 2020-2021 Session (5th SEMESTER)

		BNG-H-CC-T-11	হাঁসুলিবাঁকের ইতিকথা
		BNG-H-DSE-T-1	সাহিত্যতত্ত্ব
		BNG-H-DSE-T-2	বাংলাদেশ বহিরবঙ্গের প্রবন্ধ
Dr. Achintya Kumar Gangopadhyay	5 th semester	BNG-G-DSE-T-1	সাহিত্যতত্ত্ব
		BNG-G-SEC-T-3	তরুমূলক গান
		BNG-G-SEC-T-3	পৰ্ব- ত
		BNG-H-CC-T-12	নাটকের রূপজেন এবং রঙ্গমঞ্চ থিয়েটারের ধারা
		BNG-H-DSE-T-1	সহিত্যতন্ত্র
ioma Karmakar	5th semester	BNG-H-DSE-T-2	শাটক - কবর
	semester	BNG-G-DSE-T-4	সহিত্যতত্ত্ব
		BNG-G-GE-T-1	লখের রশি
		BNG-H-CC-T-11	পথের পাঁচালী
		BNG-H-CC-T-12	রখের রশি
		BNG-H-DSE-T-1	সাহিত্য সমালেচনামূলক প্রবন্ধ
'amal Kanti Pal	5th semester	BNG-H-DSE-T-2	গ্রবন্ধ
		BNG-G-GE-T-1	নীল্দপ্থ
		BNG-G-SEC-T-3	অন্তমূলক গান
	1	BNG-H-CC-T-11	অম্যবস্যার খান
	5th semester	BNG-H-DSE-T-2	ফেটগর
Motiur Biswas		BNG-G-DSE-T-4	সাহিত্য সমালোচনা
		BNG-G-GE-T-1	নাটকের রূপ্ডেন ও বালো রহ্মহয়
		BNG-G-SEC-T-3	ভার্জ্যাইয়া, অটিয়ালি, আলকাপ
		BNG-G-GE-T-1	শাটকের রাগতেন
Rejanur Jaman Shah	5th semester	BNG-G-GE-T-1	রঙ্গমঞ্চ ও থিয়েটারের ধারা
		BNG-H-DSE-T-2	বাংলাদেশবহিরবঙ্গেরকবিতা

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Distribution of Syllabus 2021-2022 Session (1st SEMESTER)

NAME OF TEACHER	SEMESTER	PAPER	CONTENT
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন যুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (অধ্যন্ত যুগ)
Dr. Achintya Kumar	1=1 semester	BNG-H-GE-T-1	অলপ্ধার
oangopaunyay		BNG-G-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধাযুগ)
		BNG-H-CC-T-1	বাংগা ভাষাতত্ব (প্রথম ভাগ)
		BNG-H-CC-T-2	বাংলা ভাষ্যভন্থ (খিতীয় ভাগ)
Soma Karmakar	1ª semester	BNG-H-GE-T-1	हम
		BNG-G-CC-T-1	হন্দ ও অলভাব
		BNG-G-AECC-T-1	ছোইগল্প
	1st semester	BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধাযুগ)
		BNG-H-CC-T-2	ৰাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
Tamal Kanti Pal		BNG-H-GE-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)
		BNG-G-AECC-T-1	কৰিতা
		BNG-H-CC-T-1	ৰাংলা সাহিত্যের ইতিহাস (মধ্যযুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
Motiur Biswas	1st semester	BNG-H-GE-T-1	যৈষ্ণব পদাবদী
	1	BNG-G-CC-T-1	বৈশ্বব পদাবলী

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Distribution of Syllabus 2021-2022 Session (2nd SEMESTER)

		BNG-H-CC-T-3	ष्टम.
		BNG-H-CC-T-4	অলঙ্কার
Dr. Achintya Kumar Gangopadhyay	2 nd semester	BNG-H-GE-T-2	গনা, গ্রবদ্ধ ও কাব্য কবিডা
oangopaunyay		BNG-G-LCC-T-1	উপন্যাস - পত্নীসমাজ
		BNG-G-CC-T-2	ৰাংলা সাহিত্যের ইতিহাস (জাধনিক যগ)
		BNG-H-CC-T-3	বৈশ্বর পদাবলী
		BNG-H-GE-T-2	ভাষাতপু
Soma Karmakar	2nd semester	BNG-H-AECC-T-1	পর রচনা, প্রতিবেদন
		BNG-G-LCC-T-1	মেঘনাদৰখ কাৰা
		BNG-G-CC-T-2	বাংশা ভাষাতত্ত্ব
	2nd semester	BNG-H-CC-T-3	কৃত্তিবাসী রামায়ণ
		BNG-H-CC-T-4	অয়দামসণ
Tamal Kanti Pal		BNG-H-GE-T-2	উপনাস ও ছোটগল্প
		BNG-H-AECC-T-1	জোটগল্প ও কবিতা
		BNG-G-LCC-T-1	শ্যন্ত গদাবলী
		BNG-H-CC-T-3	বৈদ্ধৰ পদাননী
		BNG-H-CC-T-4	শ্যাক্ত শান্যবদী
Motiur Biswas	2nd	BNG-H-GE-T-2	সায়নিক পত্র ও নটক
	semester	BNG-H-AECC-T-1	পরিচায়া
		BNG-G-CC-T-2	উপন্যাস, ছেটগন্ন, সাময়িক পত্র ও নাটক

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Distribution of Syllabus 2021-2022 Session (3rd SEMESTER)

	1	BNG-H-CC-T-6	রাজসিংহ
		BNG-H-CC-T-7	কমলাকান্ডের দন্তর
		BNG-H-GE-T-3	সাহিত্যের ইতিহাস
Dr. Achintya Kumar Ganganadhyay	3rd	BNG-H-SEC-T-1	ছোটপল্লের নাট্যরূপ ও গ্রন্থ পর্যালোচনা
onigopaniyay	Jennester	BNG-G-CC-T-3	জীবনস্মৃতি
		BNG-G-SEC-T-1	ছোটগল্পের নাট্যরূপ ও গ্রন্থপর্যালোচনা
		BNG-H-CC-T-5	কথাসাহিতের রূপজেন
		BNG-H-CC-T-6	দ্বরে বাইরে
	1	BNG-H-CC-T-7	প্রবন্ধ নিবক্ষের রপ্রচেদ
Soma Karmakar	3rd semester	BNG-H-GE-T-1	इम
		BNG-H-SEC-T-1	বাদান বিধি, প্রুফ রিডিং এবং গ্রন্থ পর্যলোচনা
	1	BNG-G-CC-T-3	ঞ্জীবনযুতি
		BNG-G-SEC-T-1	বানান বিধি, প্রন্ফ সংশেখন
		BNG-H-CC-T-5	আধূনিক বাংলা ছেটগল্প
		BNG-H-GE-T-1	ৰাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)
Tamal Kanti Pal	3rd	BNG-G-CC-T-3	জীবনী, আৰ্জীবনী ও ভ্ৰমণকাহিনী
	Semester	BNG-G-LCC-T-2	কবিতা
		BNG-G-SEC-T-1	কবিতা ত শাটক শাঠ
		BNG-H-CC-T-5	রবীন্দ্রনাথের ছেউগর
		BNG-H-CC-T-6	প্রীকার (প্রথম পর্ন)
		BNG-H-CC-T-7	আমার জীবন
Motiur Biswas	3rd	BNG-H-GE-T-1	বৈদ্ধব পদ্যবন্ধী
		BNG-G-CC-T-3	পানামৌ
		BNG-G-SEC-T-1	গ্রন্থ পর্যাল্যেচনা

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Distribution of Syllabus 2021-2022 Session (4th SEMESTER)

		BNG-H-CC-T-8	রবীন্দ্রনাথের প্রবন্ধ
		BNG-H-CC-T-8	সমালোচনামূলক প্রবন্ধ
		BNG-H-CC-T-9	কাব্যের রপঙ্চেদ ও কাব্যলিজ্ঞাসা
Dr. Achintya Kumar Gangopadhyay	4th semester	BNG-H-GE-T-4	কাৰ্য-কবিতা
		BNG-H-SEC-T-2	পৰ্ব- ৩
		BNG-G-CC-T-4	প্রবন্ধ
		BNG-G-SEC-T-2	পর্ব- ও
		BNG-H-CC-T-9	বীরাঙ্গনা
		BNG-H-CC-T-10	গ্রাক্ চল্লিশ কবিতা
		BNG-H-SEC-T-2	গবেষণার রীচি পছডি, সাহিত্য বিষয়ক প্রবন্ধ রচনা
Soma Karmakar	4th semester	BNG-G-LCC-T-2	জেটগর
		BNG-H-CC-T-4	কপালকুঞা
		BNG-G-SEC-T-2	প্রতিবেদন ও বিজ্ঞাপন বয়না
		BNG-H-CC-T-8	বাংলা সমচলচনামূলক প্রবন্ধ
		BNG-H-CC-T-9	উনবিংশ শতকের গীতিকবিতা সংবলন
	4th semester	BNG-H-CC-T-10	সঞ্চয়িতা
Tamal Kanti Pal		BNG-H-GE-T-2	সাহিত্যের ইতিহাস : গদা, প্রবন্ধ ও কারা-কবিতা
		BNG-G-CC-T-4	একেই কি বলে সন্তৱ৷
		BNG-G-SEC-T-2	সহিত্য বিষয়ক প্রবন্ধ রচনা
		BNG-H-CC-T-9	কার্জের সংজ্ঞা ও রাপজেন
		BNG-H-CC-T-10	উত্তন চল্লিশ বাংলা কৰিতা
	16	BNG-H-GE-T-2	ভাষাতত্ত্ব
		BNG-H-GE-T-4	উপন্যাস ও হোটগল্প
Motiur Biswas	4th	BNG-G-LCC-T-2	ভাকমৰ
	semester	BNG-G-CC-T-4	বংগা প্রবন্ধ
		BNG-G-SEC-T-2	সন্ধালনা ও সংবাদ পাঠ

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Distribution of Syllabus 2021-2022 Session (5th SEMESTER)

	1	BNG-H-CC-T-11	হাঁসুলিবাঁকের ইতিকথা
		BNG-H-DSE-T-1	সাহিত্যতত্ত্ব
	0	BNG-H-DSE-T-2	বাংলাদেশ বহিরবঙ্গের প্রবন্ধ
		BNG-H-DSE-T-2	বাংলাদেশ বহিরবঙ্গের কবিতা
Dr. Achintya Kumar Gangopadhyay	5th semester	BNG-G-DSE-T-1	সাহিত্যতত্ত্ব
	Semister	BNG-G-SEC-T-3	তত্ত্বমূলক গান
		BNG-G-SEC-T-3	পর্ব- ও
		BNG-H-CC-T-12	নাউকের রূপজেন এবং রঙ্গমঞ্চ থিয়েটারের ধারা
		BNG-H-DSE-T-1	সহিত্যতত্ব
Soma Karmakar	5th semester	BNG-H-DSE-T-2	নাটক - কবর
		BNG-G-DSE-T-4	সহিত্যতত্ব
		BNG-G-GE-T-1	রখের রশি
		BNG-H-CC-T-11	পথের পাঁচালী
		BNG-H-CC-T-12	রমের রশি
		BNG-H-DSE-T-1	সাহিতা সমলেচনামূলক প্রবন্ধ
lamal Kanti Pal	5th	BNG-H-DSE-T-2	প্রবন্ধ
	Semester	BNG-G-GE-T-1	নীলদর্শণ
		BNG-G-SEC-T-3	কত্বমূলক ধান
		BNG-H-CC-T-11	অমৰসাৱ গান
	li i	BNG-H-DSE-T-2	মোটগর
Aotiur Biswas	5th semester	BNG-G-DSE-T-4	সাহিত্য সমালোচনা
		BNG-G-GE-T-1	নাটকের রূপচেন ও বাংলা রঙ্গমঞ্জ
		BNG-G-SEC-T-3	ভাব্যাইয়া, ডাটিয়ালি, আলকাপ

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		BNG-H-CC-T-14	ইংরাজী সাহিত্যের ইতিহাস
		BNG-H-DSE-T-3	গোয়েন্দাসহিত্য
Dr. Achintya Kumar Gangopadhyay	6 TH	BNG-G-DSE-T-2	গোয়েন্সাসহিত্য
	Junear	BNG-H-DSE-T-4	ছোটগল্প
		BNG-G-SEC-T-4	গ্রবন্ধ রচনা
		BNG-H-CC-T-13	পরিবেশ সংক্রম্ভ গছ
		BNG-H-CC-T-14	লোকসাহিত্য
Soma Karmakar	6 th semester	BNG-H-DSE-T-4	নাটক- চুউপা আদালত চলছে
		BNG-G-DSE-T-2	বাংলা রূপকথা ও উপকথা
		BNG-G-SEC-T-4	প্রন্ফ সংশোধন ও আই.পি.এ.
		BNG-H-CC-T-13	পরিবেশ স্যাক্রনন্ত প্রবন্ধ
	-	BNG-H-CC-T-14	সংস্কৃত সহিতেরে ইঠিহান
Tamal Kanti Pal	6 th semester	BNG-H-DSE-T-3	আবোল-ভাবোল
		BNG-G-GE-T-2	পরিবেশ সংক্রমন্ত গল্প ও উপন্যাস
		BNG-G-DSE-T-2	আবোলতাবোল
-	10	BNG-H-CC-T-13	উপন্যস- প্রকৃতি গাঠ
		BNG-H-DES-T-3	বাংলা রূপকথা 6 উপকথা
		BNG-H-DSE-T-4	প্রাদেশিক ভোটগায়
Motiur Biswas	6th semester	BNG-G-DSE-T-2	গেন্ডেন্স সহিত্য
		BNG-G-GE-T-2	পরিবেশ সংক্রান্ত কবিতা ও প্রবন্ধ
		BNG-G-SEC-T-4	সাহিত্য বিষয়ক প্রবাদ রচনা

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NAME OF TEACHER	SEMESTER	PAPER	CONTENT
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন যুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (অধ্যন্ত যুগ)
Dr. Achintya Kumar	1=t semester	BNG-H-GE-T-1	অলঙ্খার
oangopaunyay		BNG-G-CC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)
		BNG-H-CC-T-1	বাংগা ভাষাতত্ব (প্রথম ভাগ)
		BNG-H-CC-T-2	বাংলা ভাষ্যভন্থ (খিতীয় ভাগ)
Soma Karmakar	1 st semester	BNG-H-GE-T-1	हम
		BNG-G-CC-T-1	হন্দ ও অলভাব
		BNG-G-AECC-T-1	বাংলা সাহিত্যের ইতিহাস (প্রার্থনিক বু অলম্বার বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধাযুগ) বাংলা ভাষাভত্ব (রিডীয় ভাগ) বাংলা ভাষাভত্ব (রিডীয় ভাগ) ছন্দ ছন্দ ও অলম্বার হোটগন্ন হেয়টগন্ন বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ) বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ) বাংলা সাহিত্যের ইতিহাস (প্রাচ্না প্র মধ্যযুগ) করিয় বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ বাংলা সাহিত্যের ইতিহাস (প্রাণ্ডনিক যুগ) বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ বাংলা সাহিত্যের ইতিহাস (মধ্যযুগ
		BNG-H-CC-T-1	বাংলা সাহিত্যের ইতিহাস (মধাযুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
Tamal Kanti Pal	1st semester	BNG-H-GE-T-1	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)
		BNG-G-AECC-T-1	কৰিতা
		BNG-H-CC-T-1	ৰাংলা সাহিত্যের ইতিহাস (মধ্যযুগ)
		BNG-H-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ)
Motiur Biswas	1st semester	BNG-H-GE-T-1	যৈন্ধব পদাবদী
	1	BNG-G-CC-T-1	বৈশ্বব পদাবলী

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DEPARTMENT OF BENGALI

Distribution of Syllabus 2022-2023 Session (2nd SEMESTER)

		BNG-H-CC-T-3	ष्टम्
		BNG-H-CC-T-4	অলম্ভার
Dr. Achintya Kumar Gangonadhyay	2 nd semester	BNG-H-GE-T-2	গনা, প্রবন্ধ ও কাব্য কবিডা
oangopaunyay		BNG-G-LCC-T-1	উপন্যাস - পত্নীসমাজ
		BNG-G-CC-T-2	বাংলা সাহিত্যের ইতিহাস (আধনিক যগ)
		BNG-H-CC-T-3	বৈদ্ধর পদ্যবদী
		BNG-H-GE-T-2	ভাষাতবু
Soma Karmakar	2nd semester	BNG-H-AECC-T-1	পর রচনা, প্রতিবেদন
		BNG-G-LCC-T-1	মেঘনাদৰখ কাৰা
		BNG-G-CC-T-2	পদা, প্রবন্ধ ও রাবা কবিডা উপন্যাস - পর্য্তীসমাজ বাংলা সাহিত্যের ইতিহাস (আধুনিক যুগ) বৈদ্ধর পদাবলী তাথাতত্ব পর রচনা, প্রতিবেদন প্র রচনা, প্রতিবেদন বাংলা ভাষাতত্ব কৃত্তিরাসী রামায়ণ অমদামঙ্গণ উপন্যস ও হোটগল্প উপন্যস ও হোটগল্প হোটগল্প ও কবিতা পান্ড গলবলী বিদ্ধর পদাবলী
	1	BNG-H-CC-T-3	কৃত্তিবাসী রামায়ণ
	5	BNG-H-CC-T-4	বয়ন্দমঙ্গ
Tamal Kanti Pal	2nd	BNG-H-GE-T-2	উপনাস ও হোটগল্প
	semester	BNG-H-AECC-T-1	জোটগল্প ও কবিতা
	20 C	BNG-G-LCC-T-1	শান্ড গদাবলী
	1	BNG-H-CC-T-3	বৈষ্ণৰ পদানলী
		BNG-H-CC-T-4	শান্ড শন্যবদী
Motiur Biswas	2nd	BNG-H-GE-T-2	সাময়িক পত্র ও নটক
	semester	BNG-H-AECC-T-1	পরিচায়া
		BNG-G-CC-T-2	উপন্যাস, ছেটগল্প, সাময়িক পত্র ও নাটক

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		BNG-H-CC-T-6	রাজসিংহ
	1	BNG-H-CC-T-7	কমলাকান্তের দন্তর
		BNG-H-GE-T-3	সাহিত্যের ইতিহাস
Dr. Achintya Kumar Gangopadhyay	3rd semester	BNG-H-SEC-T-1	ছোটগল্লের নাট্যরূপ ও গ্রন্থ পর্যালোচনা
		BNG-G-CC-T-3	জীবনশ্বতি
		BNG-G-SEC-T-1	দ্বোটগল্পের নাট্যরূপ ও গ্রন্থপর্যালোচনা
		BNG-H-CC-T-5	কথাসাহিতেরে রূপঞেন
		BNG-H-CC-T-6	ছরে বাইরে
		BNG-H-CC-T-7	প্রবন্ধ নিবন্ধের রপত্রেদ
Soma Karmakar	3rd semester	BNG-H-GE-T-1	<u>इन्म</u>
		BNG-H-SEC-T-1	বানান বিধি, প্রুফ রিডিং এবং গ্রন্থ পর্যলোচনা
		BNG-G-CC-T-3	কমলাকান্ডের দন্ডর সাহিত্যের ইতিহাস ঘ্রেটগল্লের নাট্যরূপ ও গ্রন্থ পর্যালোচন জীবনস্মৃতি হোটগল্লের নাট্যরূপ ও গ্রন্থ পর্যালোচন হুম্ম ঘরে বাইরে গ্রন্থ বাহরে গ্রন্থ হাব বাইরে গ্রন্থ হাব বাইরে গ্রন্থ বাহরে রঙ্গভেদ ছন্দ বানান বিদি, প্রন্ফ রিভিং এবং গ্রন্থ পর্যলোচন জীবনস্মৃতি বানান বিদি, প্রন্ফ রিভিং এবং গ্রন্থ পর্যলোচন জীবনস্মৃতি বানান বিদি, প্রন্ফ রিভিং এবং গ্রন্থ পর্যলোচন জীবনস্মৃতি বানান বিদি, প্রন্ফ রিভিং এবং গ্রন্থ পর্যলোচন জীবন হান্ডি গ্রন্থ প্রান্ত বালা ভেটপল্প বান্লা সাহিজের ইভিয়ান (প্রান্ডীন ও মধ্যমুন্দ জীবনী, আত্মজীবনী ও জ্ঞমনকাহিনী কবিতা কবিতা উবিজ্ঞ (প্রথম পর্ব) আমার জীবন বৈম্কর পানাবনী
		BNG-G-SEC-T-1	বানান বিধি, প্রথফ সংশোধন
		BNG-H-CC-T-5	আধূনিক বাংলা ছেটপন্ন
		BNG-H-GE-T-1	বাংলা সাহিজের ইতিহাস (প্রাচীন ও মধ্যযুগ)
Tamal Kanti Pal	3rd semester	BNG-G-CC-T-3	জীৰনী, আত্মজীৰনী ও অমণকাহিনী
		BNG-G-LCC-T-2	কবিতা
	10	BNG-G-SEC-T-1	কৰিতা ও নাটক পাঠ
	1	BNG-H-CC-T-5	রবীন্দ্রনাথের মেউগল্প
		BNG-H-CC-T-6	শ্রীকান্ত (হাধম গার্গ)
		BNG-H-CC-T-7	আমার জীবন
Motiur Biswas	3rd semester	BNG-H-GE-T-1	বৈশ্বব পদাবলী

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		BNG-H-CC-T-8	বাংলা প্রবন্ধ এবং প্রবীন্দ্রশাধের প্রবন্ধ
		BNG-H-GE-T-2	সাহিত্যের ইতিহাস : উপনাস, ছোটগল্প, সাময়িক পত্র, নাটক
Dr. Achintya Kumar Gangopadhyay	4th semester	BNG-H-SEC-T-2	প্রতিবেদন, বিজ্ঞাপন রচনা, সঞ্চালনা, সংবাদ পাঠ
		BNG-G-LCC-T-2	কবিতা
-		BNG-H-CC-T-9	বীরাঙ্গনা
		BNG-H-CC-T-10	গ্রাক্ চল্লিশ কবিতা
		BNG-H-SEC-T-2	গবেষণান নীতি পদ্ধতি, সাহিত্য বিষয়ক প্ৰবন্ধ নচনা
Soma Karmakar	4th semester	BNG-G-LCC-T-2	হোটগল্প
	Juneator	BNG-H-CC-T-4	কপালকুডনা
		BNG-G-SEC-T-2	প্রতিবেদন ও বিজ্ঞাপন রচনা
		BNG-H-CC-T-8	বাংলা সমলোচনামূলক প্রবন্ধ
		BNG-H-CC-T-9	উনবিংশ শচকের গীতিকবিতা সংকলন
	2	BNG-H-CC-T-10	পঞ্চিতা
Tamal Kanti Pal	4th semester	BNG-H-GE-T-2	সাহিত্যের ইতিহাস : গদা, প্রবন্ধ ও কার্ড কবিতা
		BNG-G-CC-T-4	একেই কি বলে সন্তব্য
		BNG-G-SEC-T-2	সহিত্য বিষয়ক প্রবন্ধ রচনা
1	1	BNG-H-CC-T-9	কাবের সংজ্ঞা ও রূপচেদ
	ti i	BNG-H-CC-T-10	উন্তর চল্লিশ বাংগা কবিতা
		BNG-H-GE-T-2	হায়াত বু
Motiur Biswas	4th	BNG-G-LCC-T-2	ভাকঘর
		BNG-G-CC-T-4	বাংলা প্রবন্ধ
		BNG-G-SEC-T-2	সঞ্চলেনা ও সংবাদ পাঠ

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Distribution of Syllabus 2022-2023 Session (5th SEMESTER)

		BNG-H-CC-T-11	হাঁসুলিবাঁকের ইতিকথা
	1	BNG-H-DSE-T-1	সাহিত্যতত্ত্ব
		BNG-H-DSE-T-2	বাংলাদেশ বহিরবঙ্গের গ্রবন্ধ
		BNG-H-DSE-T-2	বাংলাদেশ বহিরবঙ্গের কবিতা
Dr. Achintya Kumar Gangopadhyay	5th semester	BNG-G-DSE-T-1	সাহিত্যতত্ত্ব
angopaunyay		BNG-G-SEC-T-3	তভুম্লক গান
		BNG-G-SEC-T-3	পর্ব- ও
		BNG-H-CC-T-12	নাউকের রূপজেন এবং রঙ্গমঞ্জ থিয়েটারের ধারা
		BNG-H-DSE-T-1	সহিত্যতত্ত্ব
5oma Karmakar	5th semester	BNG-H-DSE-T-2	নাটক - কবর
		BNG-G-DSE-T-4	শহিত্যকণ্
		BNG-G-GE-T-1	রখের রশি
		BNG-H-CC-T-11	পথের পাঁচানী
	3	BNG-H-CC-T-12	রখের রশি
		BNG-H-DSE-T-1	সাহিত্য সমল্যেচনামূলক প্ৰবন্ধ
famal Kanti Pal	5th	BNG-H-DSE-T-2	প্রবন্ধ
		BNG-G-GE-T-1	নীলদর্গণ
		BNG-G-SEC-T-3	তত্ত্বমূলক গান
		BNG-H-CC-T-11	অমাৰসাৱ পান
	16	BNG-H-DSE-T-2	হেটগর
Aotiur Biswas	5th	BNG-G-DSE-T-4	সাহিত্য সমালোচনা
	Semester	BNG-G-GE-T-1	নাটকের রূপচেন ও বাংলা রাজমঞ্জ
	10	BNG-G-SEC-T-3	নাওয়াইয়া, জটিয়ালি, আলকাশ
		BNG-H-CC-T-11	হাঁসুলিবাঁকের ইতিকথা
		BNG-H-DSE-T-1	সাহিত্যতন্ত্র

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Distribution of Syllabus 2022-2023 Session (6th SEMESTER)

		BNG-H-CC-T-14	ইংরাজী সাহিত্যের ইতিহাস
		BNG-H-DSE-T-3	গোয়েন্দাসহিত্য
Dr. Achintya Kumar Gangopadhyay	6 TH semester	BNG-G-DSE-T-2	গোয়েন্সাসহিত্য
		BNG-H-DSE-T-4	ছোটগল্প
		BNG-G-SEC-T-4	গ্রবন্ধ রচনা
		BNG-H-CC-T-13	পরিবেশ সংক্রান্দ্র গল্প
	1	BNG-H-CC-T-14	লোকসাহিত্য
Soma Karmakar	6th semester	BNG-H-DSE-T-4	নাটক- চুউপা আদালত চলছে
		ster BNG-G-DSE-T-2 বাংলা রূপকথা ও উপকৃষ BNG-G-SEC-T-4 প্রফ সংশোধন ৬ আই.পি.এ	বাংলা রূপকথা ও উপকথা
		BNG-G-SEC-T-4	প্রফ সংশোধন ও আই,পি.এ.
		BNG-H-CC-T-13	পরিবেশ সংক্রনন্ধ প্রবন্ধ
		BNG-H-CC-T-14	সংস্কৃত সহিতেরে ইতিহাস
Tamal Kanti Pal	6 th semester	BNG-G-SEC-T-4 প্রবন্ধ রচনা BNG-H-CC-T-13 পরিবেশ সংক্রান্ত গয় BNG-H-CC-T-14 লোকসাহিত্য BNG-H-DSE-T-4 নাটক- চুউণা আদালত চলহে BNG-G-DSE-T-2 বাংলা রূপকথা ও উপকথা BNG-G-SEC-T-4 প্রাংলা রূপকথা ও উপকথা BNG-G-SEC-T-4 প্রাংলা রূপকথা ও উপকথা BNG-G-SEC-T-4 প্রাংলা রূপকথা ও উপকথা BNG-H-CC-T-13 পরিবেশ সংক্রান্ড প্রবন্ধ BNG-H-CC-T-14 সংস্কৃত সহিতোর ইতিহাস BNG-H-DSE-T-3 আবোল-তাবোল BNG-G-GE-T-2 প্রিবেশ সংক্রান্ত গয় ও উপন্যাস BNG-G-DSE-T-2 আবোল-তাবোল BNG-G-DSE-T-2 আবোলতাবোল BNG-H-DSE-T-3 উপন্যাস- প্রকৃতি গার্ট BNG-H-DSE-T-3 উপন্যাস- প্রকৃতি গার্ট BNG-H-DSE-T-3 উপন্যাস- প্রকৃতি গার্ট BNG-H-DES-T-3 বিংল ক্রাক্ষ ৬ উপকথা BNG-H-DSE-T-4 রাচেনপিক ছেটপান্ন	
		BNG-G-GE-T-2	পরিবেশ সংক্রনন্ত গল্প ও উপন্যাস
		BNG-G-DSE-T-2	আবোলতাবোল
	17	BNG-H-CC-T-13	উপনাস- গুরুতি গাঠ
		BNG-H-DES-T-3	বংগ রগক্যা ৬ উপকথা
		BNG-H-DSE-T-4	প্রাদেশিক ছোটগল্প
Motiur Biswas	6 ^{III} semester	BNG-G-DSE-T-2	গেয়েন্দা সহিত্য
		BNG-G-GE-T-2	গৱিবেশ সংক্রান্দ্র কবিতা ও প্রবন্ধ
		BNG-G-SEC-T-4	সহিত্য বিষয়ক প্রবন্ধ রচনা

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Curriculum Plan of Dipanwita Chowdhury for Even Semesters						
Department of History						
	1	Dumkal Co	llege			
Name of Teacher	Year	Course	Content	No of Period		
Dipanwita	2nd sem	Course-III	Unit-3: Age of the Guptas	05		
Chowdhury	(Hons)	Ancient India from	Debates on golden age	03		
		the Maurya to Late		0.0		
		Gupta period	Consolidation of Second Magadhan empire	04		
			Brahminical revival and growth of feudalism	04		
			Decline of the Gupta power	03		
			Beginning of political decentralization of India	04		
		Assessing Harshavardhana as the last great emperor	03			
Dipanwita Chowdhury	nwita2nd semwdhury(Hons GE)& 2 nd sem(Gen)	2nd sem B.A. (General (Hons GE) Program) in History & 2 nd sem& Also 2 nd sem(Gen)(Hons GE)	Unit-2: Delhi on the eve of the Mughal ascent - Timur's invasion - the Sayyids and Lodis	8		
		Course – II	Babur's adventure - Babur's central			
	His Inc	History of Medieval India	Asian connection - Humayun's misfortune	6		
			Sher Shah Sur and Afghan rule in India	5		
			Making of the Mughal State from Akbar to Aurangzeb.	10		
Dipanwita Chowdhury	4 th sem (Hons)	Course – IX History of Late Medieval India	Unit -4: Emergence of successor states – Bengal, Awadh, Mysore and Hyderabad.	10		
Dipanwita Chowdhury	4 th sem (Hons	Skill Enhancement Elective Course (For	Unit-1: History of Music in Bengal	3		
	G	both Honours and General)	Influence of Vaishnava poetry of the 13th – 14th century	2		
		Course – I	Mixture of Hindu and Islamic trends	2		



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		The Bengal Music	Patronage of Nawabs and big landlords particularly the Baro Bhuiyans	3
Dipanwita Chowdhury	4 th sem (Hons)	Skill Enhancement Elective Course Course – II	Unit-2: Technologies and instruments of electronic communication –	4
		Studies in Electronic	state and administration –	4
		System	people and their culture	4
Dipanwita Chowdhury	^{6th} sem (Hons)	Course – XIII Modern Europe:	Unit-4: The socialist challenge - from utopian to Marxian socialist	4
		From Nationalism to Socialism	The German, French and Russian variety of socialist politics	6
Dipanwita Chowdhury	^{6th} sem (Hons) (Hons) Course – XIV Trends in World Politics from the Fir to the Second World War	Course – XIV Trends in World Politics from the First to the Second World	Unit-3: Aspects of the war economy in the inter-war period - the depression and new theories of mixed economy	6
		War	The collapse of the Weimer state in Germany	3
			The rise of the Nazis to power	3
			Fascism in Italy	3
Dipanwita Chowdhury	^{6th} sem (Hons)	Discipline Specific Elective Course Course - I History of Bangladesh from Liberation to the present day	Unit 3: Bangladesh after independence – society, economy and politics	8
Dipanwita Chowdhury	^{6th} sem (Hons)	Discipline Specific Elective Course	Unit-1: Women in the Indian tradition	3
		Course – III History of Women in India	Different socio-religious movements in pre-colonial India and women's position re-defined	4



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Dipanwita Chowdhury	^{6th} sem (General)	Skill Enhancement Course (SEC) Semester-VI	Unit IV: Legacy of European Culture in India with special focus on the South, the East and the North East –	8
		Course-I History and Tourism in India	revisiting Bengal at Kolkata, Serampore, Chandannagar, Hooghly, the Duars and the hill station of Darjeeling	8

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Curriculum Plan of Jayanta Kar for Even Semesters							
	Department of History Dumkal College						
Name of Teacher	Year	Course	Content	No of Period			
Jayanta Kar	2nd sem (Hons))	Course-IV History of Early Medieval India	Unit-3: Condition in the pre-Sultanate period - Polity, Society, Economy, Religion and Culture - towards transition.	08			
Jayanta Kar	2nd sem (Hons GE) & 2 nd sem	B.A. (General Program) in History & Also 2 nd sem (Hons CE)	Unit-1: Northern India under the Delhi Sultanate - consolidation of the Sultanate from 1206 to 1286 AD;	10			
(Gen)	(Gen)	Course – II	Decline of the Delhi Sultanate	3			
		History of Medieval India	The Khalji Revolution and the omnipotent state under the Khaljis	4			
			The Tughluq period of reforms and counter reforms;	5			
			The successor states of Bijoynagar, Bahmani and Benga	8			
			Society, economy, art, architecture and literature.	5			
Jayanta Kar	2nd sem (Hons GE) & 2 nd sem (Gen)	B.A. (General Program) in History & Also 2 nd sem	Unit-2: Delhi on the eve of the Mughal ascent - Timur's invasion - the Sayyids and Lodis	8			
		(Gen) (Hons GE) Course – II History of Medieval India	Babur's adventure - Babur's central Asian connection - Humayun's misfortune	6			
			Sher Shah Sur and Afghan rule in India	5			
			Making of the Mughal State from Akbar to Aurangzeb.	10			
			Society and culture – religion of the masses - language, music and literature;	10			



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			art and architecture.	
Jayanta Kar	4 th sem (Hons)	Course - VIII History of Mughal India	Unit-1: Survey of sources and different aspects of historiography of Mughal India Reading of the texts of AbulFazal, Badauni, Abdul Hamid Lahori and Bernier Studies in the writings of Sir Jadunath Sarkar and historians from Delhi and Aligarh schools	4 10 6
Dipanwita Chowdhury	4 th sem (Hons)	Course – IX History of Late Medieval India	Unit -4: Emergence of successor states – Bengal, Awadh, Mysore and Hyderabad.	10
Dipanwita 4 th sem Chowdhury (Hons	4 th sem (Hons	Skill Enhancement Elective Course (For both Honours and General) Course – I The Bengal Music	Unit-1: History of Music in Bengal Influence of Vaishnava poetry of the 13th – 14th century	3 2
			Mixture of Hindu and Islamic trends Patronage of Nawabs and big landlords particularly the Baro Bhuiyans	2 3
Dipanwita Chowdhury	4 th sem (Hons)	Skill Enhancement Elective CourseCourse – IIStudies in Electronic CommunicationSystem	Unit-2: Technologies and instruments of electronic communication – state and administration – people and their culture	4 4 4
Jayanta Kar	Jayanta Kar (Gen) 4 th sem (Gen) B.A. (General Program) in History & Also 4 th sem (Hons GE) Course – IV History of Europe from the Fifteenth to the Twentieth Century	B.A. (General Program) in History & Also 4 th sem (Hons GE)	Unit-4: Roots of European imperialism Nazism and Fascism The World Wars as the total wars: from	3 4 8
		Course – IV History of Europe from the Fifteenth to the Twentieth Century	the League of Nations to the UNO The Cold War after 1945 - various military and economic alliances Regional conflicts in the bi-polar	6 12



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			world, Vietnam, Korea, Cuba, the middle East and Afghanistan	
Jayanta Kar ^{6th} sem (Hons) Course – X Modern Eur	Course – XIII Modern Europe:	Unit-3: Politics of democracy - industrial society and its critics	4	
		Socialism	New concept of welfare state	3
			Revolution in medical science	3
			Reason, social change and social reform -the new woman	5
			Arts transformed	2
Jayanta Kar	^{6th} sem (Hons)	Course – XIV Trends in World Politics from the First to the Second World War	Unit-1: Different theories of world politics - the Marxist and non-Marxist approaches	5
Jayanta Kar ^{6th} sem (Hons)	^{6th} sem (Hons)	Discipline Specific Elective Course Course - I	Unit-1: The genesis – issues of conflict between Pakistani non-Bengali elite group	6
		History of Bangladesh from Liberation to the present day	Rising Bengali middle class of East Pakistan	3
Jayanta Kar	^{6th} sem (Hons)	Discipline Specific Elective Course	Unit-3: The nationalist resolution on the women's question	3
		Course – III	women in the freedom movement in	3
		History of Women in India	India	
Jayanta Kar	^{6th} sem (Hons)	6 th sem Hons GE Course – II History of Mediaval	Unit-2: Delhi on the eve of the Mughal ascent - Timur's invasion - the Sayyids and Lodis	5
		India	Babur's adventure - Babur's central Asian connection - Humayun's misfortune	6



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			Sher Shah Sur and Afghan rule in India Making of the Mughal State from Akbar to Aurangzeb	6 8
Jayanta Kar	^{6th} sem (General)	Skill Enhancement Course (SEC) Semester-VI Course-I History and Tourism in India	Unit II: Looking for Immortal India – Kasi, Rameswaram, Kurukshetra, Prayagraja, Gaya, Puri, Madurai, Dwarka, Ujjain, Kanchi, Ayodhya, Mathura, Sringeri, Srirangam, Kedarnath, Badrinath, Pushkar, Tirupati, Nasik, Khajuraho, Kamakhya, and Dakshineswar	12

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Curriculum Plan of Kartik Chandra Das for Even Semesters				
		Department of	History	
		Dumkal Co	llege	
Name of Teacher	Year	Course	Content	No of Period
Kartik Chandra Das	tik Chandra 2nd sem (Hons) Course-III Ancient India f	Course-III Ancient India from	Unit-4: Early India in retrospect	02
		the Maurya to Late Gupta period	Society and culture and environment	06
		1 1	Literature and Philosophy	04
			Art and architecture	06
			Guild - trade and industry	02
Kartik Chandra Das	Kartik Chandra Das2nd sem (Hons)Course-I History of Medieval	Course-IV History of Early Medieval India	Unit-1: Sources of History and historiography of the period	04
			Contemporary texts and travelogues	04
			Indigenous literature and archaeology	04
Kartik Chandra Das	2nd sem (Hons GE) & 2 nd sem	B.A. (General Program) in History	Unit –3: Agrarian crisis and the decline of the Mughal Empire	5
	(Gen)	& Also 2 nd sem (Hons GE) Course – II History of Medieval India	Regional polity – the Marathas under Shivaji and the Peshwas	8
			The Sikh challenge - emergence of successor states – Bengal, Awadh, Mysore and Hyderabad.	10
Kartik Chandra Das	4 th sem (Hons)	Course - VIII History of Mughal India	Unit-3 : Routes of trade and commodity pattern of internal transactions, overseas trade and commodity pattern	8
			Markets and monetary system	6
Kartik Chandra Das	4 th sem (Hons)	Course – IX History of Late	Unit-3: Decline of the Mughal Empire - agrarian crisis	6
		Medieval India	The eighteenth-century debate	3

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Kartik Chandra Das	handra 4 th sem (Hons) Course - X Rise of Modern Europe	Unit-3: People in the French Revolution – aristocracy, bourgeois, peasants and workers	8	
		Europe	The Constituent Assembly and its achievements	3
			Girondins and Jacobins - the Reign of Terror and the Rise and fall of the Jacobin Republic	6
			The Thermidorian reaction and the Directory	3
			The Napoleonic Era	8
			Interpreting the French Revolution.	2
Kartik Chandra4th semDas(Hons)	4 th sem (Hons)	Skill Enhancement Elective Course (For both Honours and General)	Unit-3: Aspects of folk culture and folk music of Bengal – Baul, Bhatiali, Bhawaiya, Dhamali, Gambhira, Jhumur, Kavigaan and Jatra	10
		Course – I		
		The Bengal Music		
Kartik Chandra	^{4th} sem	B.A. (General	Unit-2: Seventeenth century crisis	2
Das	(Gen)	Program) in History & Also 4 th sem (Hons GE)	From scientific to Industrial Revolution	4
			Glorious Revolution in England and	4
		Course – IV (History	and state structure	
		of Europe from the Fifteenth to the	American War of Independence, birth of new democratic politics	5
		Twontiour Contury)	Rise of industrial societies in Europe	2
			The transition debate	3
Kartik Chandra	^{6th} sem	Discipline Specific	Unit-2: Feminism revisited in the	3
Das	(HOIIS)	Elective Course	Indian context	
		Course – III	the women's question in 19th century	4
		History of Women in India	the debates on Sati and Purdah	
Kartik Chandra	^{6th} sem	6 th sem Hons GE	Unit – 4: Mughal India in retrospect -	2
Das	(Hons)	Course – II	state and religion	
		History of Medieval India	Evolution of the administrative system- mansab and jagir	5



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			Management of land and agriculture	4
			Features of urban economy, trade and industry	6
			society and culture – religion of the masses - language, music and literature	8
			Art and architecture	4
Kartik Chandra Das	^{6th} sem (General)	Skill Enhancement Course (SEC) Semester-VI	Unit 1: Recollecting cultural heritage of India from the Epics for a tourist	5
		Course-I History and Tourism in India	Displaying India's heritage through art and architecture, particularly in South India – the culture of Indian History	5

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Curriculum Plan of Sanchita Mondal for Even Semesters					
		Department of	History		
		Dumkal Co	llege		
Name of Teacher	Year	Course	Content	No of Period	
Sanchita Mondal	2nd sem	Course-III	Unit-1: The Maurya rule in Magadha	05	
	(110113)	Ancient India from	Asoka's Dhamma and administration	04	
		Gupta period	The policy of cultural conquest.	02	
Sanchita Mondal	2nd sem	Course-IV	Unit-2: From centralized to	02	
	History of Early Medieval India	History of Early	decentralized India		
		Medieval India	The Rajputs of North India	03	
			Palas and Senas in Bengal	06	
				00	
			Kingdoms of the South – The Pallavas,	08	
			Kashirakutas, Chalukyas aliu Cholas		
Sanchita Mondal	4 th sem (Hons)	History of Mughal	Unit-4: Urban centres - morphology of cities	5	
		India	Urban economy – crafts, technology and industry - imperial karkhanas	8	
			Urban social structure, merchant	8	
			craftsmen and labourer		
Sanchita Mondal	4 th sem	Course - X	Unit-4: The unity and disunity in	5	
	(Hons)	Rise of Modern Europe	and		
			Rise of Metternich	3	
			Struggle between forces of continuity and change.	3	
Sanchita Mondal	4 th sem (Hons)	Skill Enhancement Elective Course	Unit-1: Different communication theories –	4	

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	41	Course – II Studies in Electronic Communication System	communication in a globalized society and economy – aspects of electronic communication	5
Sanchita Mondal	^{4th} sem (Gen)	Image: Semigration of the semigrati	Unit-3: The French Revolution; society, economy, and polity	4
	& Al (Hon	(Hons GE) Course – 1V	Philosophers and the ideological revolution	2
		History of Europe	The Napoleonic era	8
	from the Fifteenth to the Twentieth Century	The Vienna Settlement and the Metternich system	4	
		Revolutions of 1830 and 1848	6	
		Birth of the united nation	2	
			Unification of Germany and Italy as big nation states	6
			Karl Marx and the socialist challenge in Europe	4
Sanchita Mondal	^{6th} sem (Hons)	Course – XIV Trends in World Politics from the First	Unit-4: The World after 1945 - theories of the Cold War and the division of Europe	6
	to th War	War	The emergence of the American and Soviet spheres of influence – various military and economic alliances	4
				4
		Regional conflicts in the bi-polar world, Vietnam, Korea, Cuba, the middle east and Afghanistan	10	
Sanchita Mondal	^{6th} sem (Hons)	Discipline Specific Elective Course	Unit 4: Foreign policy of Bangladesh – relations with India	4

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•				
•		Course - I History of Bangladesh from Liberation to the present day	Role of Bangladesh in the SAARC and ASEAN	4
Sanchita Mondal	Sanchita Mondal ^{6th} sem (Hons) ^{6th} sem Ho (Hons) Course – II History of M India	6 th sem Hons GE Course – II History of Medieval India	E Unit-1: Northern India under the Delhi Sultanate - consolidation of the Sultanate from 1206 to 1286 AD Eval The Khalji Revolution and the omnipotent state under the Khaljis The Tughluq period of reforms and Counter reforms Decline of the Delhi Sultanate	8
				6
			The successor states of Bijoynagar, Bahmani and Bengal - society, economy, art, architecture and literature	8

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Curriculum Plan of Dipanwita Chowdhury for odd Semesters					
	Department of History Dumkal College				
Name of Teacher	Year	Course	Content	No of Period	
			Unit-1: Historiography of early India	03	
		Course – I	historical interpretations	02	
Dipanwita Chowdhury	1st sem (Hons)	History of Early India, from remote past to	imperialist vs nationalist school	02	
Chowaliary	(110113)	the end of the	leftist vs liberal school	02	
		Vedic Polity s	secular vs religious school	02	
			The Vedic literature	02	
Dipanwita Chowdhury	1st sem GE (Hons)	Generic Elective Course – I Human Rights in India	Unit-3: History of human right movements in India – intensity and impact.	06	
Dipanwita Chowdhury	1st sem GE (Hons)	Generic Elective Course – II History of Indian Environment	Unit-1: Concepts and theories of environment and ecology developed in India, idealist, materialist, non- materialist and post-materialist philosophies.	05	
Dipanwita Chowdhury	3 rd sem	Course - VI Rise of the	Unit-4: Europe from Thirty Years' War to Seven Years' War	07	
	(Hons)	Modern West	Rise of early nation states, Spain, France, England and Russia	07	



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Dipanwita Chowdhury	(3 rd sem Hons)	Skill Enhancement Elective Course Course – I Understanding	Unit-1: Defining heritage	01
			An overview of cultural and built heritage of India	02
		Heritage, Art and architecture of India	Notions of art and craft	02
Dipanwita	3 rd sem	Skill Enhancement Elective Course	Unit-2: Ideas of sports from ancient and medieval texts of India	03
Chowdhury	(110113)	Sports and Society in India in Historical Perspective	Sociology of pre-colonial Indian sports – race, religion, caste and gender.	04
Dipanwita Chowdhury	3 rd sem (Hons) G E	Generic Elective Course – V Regional History of Bengal – Nadia and Murshidabad	Unit-4: History of Art, Architecture and culture of Murshidabad.	05
			Unit-4: Colonial policy of divide and rule - religious polarisation of the nationalist leaders	03
Dinanwita		Course – XII History of	Demand for Pakistan and partition of 1947	02
Chowdhury	5 th sem (Hons)	Modern India from	The refugee questions	01
		Independence	Struggle for new developmental economy	02
			Democracy and security in the bi-polar world.	03



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		DSF	Unit-3: The People's response – from Taiping to Boxer	04
			Self –strengthening movement and reforms 1860 -1898 and 1901-1908	04
Dipanwita	5 th sem	Course – I History of China	Revolution of 1911	02
Chowdhury	(Hons)	from Tradition	From nationalism to comprador-ship	01
		to Revolution	Sun Yat Sen to Yuan-Shi-Kai - Warlordism since 1916	02
			Revolt of the Chinese working class	02
			The May Fourth Movement	02
		DSE	Unit-1: Tokugawa Baku-Han system of	02
	5 th sem (Hons)	Course – II History of Japan from Meiji Restoration to the Second World War	Japan– its nature	02
Dipanwita Chowdhury			crisis encounter with the west	01
Cnowdnury			Meiji restoration - processes of modernization – social, military, political and economic.	04
	1 st sem	B.A. (General Program) in	Unit-4: From centralized to decentralized India	02
	(General)	History	The Rajputs of North India	02
Dipanwita	Note: Also	Course – 1	Palas and Senas in Bengal	03
Chowdhury	l st sem Hons GE as per BOS	from the Earliest times to the	Kingdoms of the South – The Pallavas, Rashtrakutas, Chalukyas and Cholas	04
	guidelines	Early Medieval Period	Changes in Polity, Society, Economy, Religion and Culture - towards transition	04

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Curriculum Plan of Jayanta Kar for odd Semesters Department of History Dumkal College							
Name of Teacher	Year	Course	Content	No of Period			
			Unit-2: Evolution from palaeolithic to neolithic cultures	04			
		Course – I History of Early India, from remote past to the end of the	chalcolithic societies from Baluchistan to Gujrat	03			
Jayanta Kar	1st sem (Hons)		growth and decline of pre-state non-iron urban culture	02			
			The Harappan Civilization	05			
		Vedic Polity	Yanta Kar for odd Semesters ment of History inkal College Image: Content Image: Content				
			Journey from proto-historic to historic India.	02			
		Course- II Social Formation and Cultural pattern of the Ancient and early Medieval	Unit-4: Societies in Central Islamic Lands	02			
			Spread of Islam	03			
	1st sem		The Ummah	02			
Jayanta Kar	(Hons)		Caliphate State	04			
			Shariah	02			
		World	Sufi culture	02			
Jayanta Kar ^{1s} (H		Generic	Unit-2: International Conventions and Charters on human rights	01			
	1st sem GE (Hons)	Course – I Human Rights in	Constitution of India and provisions for protection of human rights legislation	01			
		India	Landmark court judgments on human rights in India	02			



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Jayanta Kar	1st sem GE (Hons)	Generic Elective Course – II History of Indian Environment	Unit-3: The colonial impact, structural changes in land and environment of India jangalmahals and jalmahals spread of railway network environmental degradation and problems of public health.	05
			Unit-1: The successor states of Vijayanagar, Bahmani and Bengal	04
Jayanta Kar (Hons)	Course – V	Society and economy of Vijayanagar, Bahmani and Bengal	03	
	3 rd sem (Hons)	The Delhi Sultanate in Retrospect	Art, architecture and literature of Vijayanagar, Bahmani and Bengal	03
			Industry and urbanization of Sultanate India	04
		Trade and currency of Sultanate India	04	
	Course -		Unit-1: Structural features of European feudalism	04
		Course - VI	The Crusades and the 14th century crisis of feudalism	04
Jayanta Kar	(Hons)	Rise of the Modern West	Decline of feudalism in western Europe but its survival in eastern Europe.	03
			The counter Reformation.	03
			Rise of early nation states, Spain, France, England and Russia	07
			Unit-1: Geographical explorations and overseas empires of Portugal and Spain	06
Jayanta Kar	3 rd sem (Hons)	Course – VII Europe in Transition	Shift of economic balance from the Mediterranean to the Atlantic Ocean	02
			Commercial and price revolution	03



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ard			Unit-2: Pre-colonial Indian Art and Architecture – early illustrated manuscripts and mural painting traditions	04
	Ski Enl Ele	Skill Enhancement Elective	Early medieval sculpture, style and iconography	03
Javanta Kar	anta Kar (Hons)	Course – I	Numismatic art	02
Understandin g Heritage, Art and architecture of India		Understandin g Heritage, Art and	Miniature painting, Mughal, Rajasthani and Pahari	02
		architecture of India	Early Indian architecture, stupa, cave and temple	02
	the Mughals -Indo-Persian architecture, fort, palace and mosque	02		
Jayanta Kar ^{3rd} sem (Hons)		Unit-3: Colonization of Indian sports in the 19th and 20th centuries	02	
		Skill Enhancemen t Elective	Imposition of European sports on Indian society	03
	3 rd sem	Course Course – II	Commercialization of sports	02
	(Hons)	Sports and Society in	Impact on mind and body.	02
		India in Historical Perspective	Colonial settlement and socio-economic changes	02
		reispeeuve	partition of India and birth of the present Nadia district.	02
Jayanta Kar ^{3rd sem (Hons) G E}	Generic Elective Course – V	Unit-3: Rise and fall of the Nawabi state in Murshidabad – the colonial confrontation –	03	
	G E	Regional History of Bengal – Nadia and Murshidabad	the new society and economy – growth of small towns.	03



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Jayanta Kar Jayanta Kar Jayanta Kar Jayanta Kar	Course – III	Unit-1: Expansion and Consolidation of British Rule with special reference to Bengal, Maharashtra, Mysore, Punjab and Awadh	04	
	& also 3 rd sem GE for	History of Modern India	Colonial state and development of its administration	02
	hons as per	till	Orientalism and Utilitarianism –	02
	BOS for History	Independence	Land revenue settlements and results thereof.	02
			Colonisation of education	01
			The women's question	02
		Course - XI	Unit-4: Nature of colonial exploitation	02
		History of Modern India	Drain of wealth & Famines in India	04
Jayanta Kar ^{5th sem (Hons)}	from the	monetization and entitlement debate	01	
	colonial rule to	Resistance from the tribes and peasants till the Revolt of 1857	04	
		Revolt	Analysing the Revolt and its aftermath.	02
	Cours		Unit-3: Interpreting Indian nationalism – messianic and developmental	02
Jayanta Kar 5 th sem (Hons)	Course – XII History of	Different phases of the nationalist struggle	02	
	Modern India	Politics of association and politics of union	01	
	5 th sem (Hons)	from Renaissance	Different political parties and their ideologies	02
		Independence	Role of Gandhi, Tagore, Subhas Bose, Nehru and Jinnah –	04
		Revolt Course – XII History of Modern India from Renaissance to Independence	Workers' and peasants' movements	03
			Unit-1: Traditional China – Sino-centrism - society - social groups and classes	03
			Confucian value system	02
Jayanta Kar		DSE Course I	Closed Chinese economy	01
	5 th sem	History of	The Canton trades	02
	(HOIIS)	China from	From nationalism to comprador-ship	01
		Revolution	Sun Yat Sen to Yuan-Shi-Kai - Warlordism since 1916	02
			Revolt of the Chinese working class	02
			The May Fourth Movement	02



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		DSF	Unit-3: Growth of militarism in Japan	02
		Course – II	And her imperialist projects	01
Jayanta Kar ⁵ (5 th sem	History of Japan from	Sino -Japanese relations	01
	(Hons)	Meiji	Anglo-Japanese alliance	01
		Restoration to the Second	Russo-Japanese war	02
		World War	World War I and after	02
			The Manchurian crisis.	02
			Unit-2 : Crisis in the socialist block – theory and practice	02
Jayanta Kar 5 th so (Hor		DCE	Impact of the rise of China as a new socialist state	01
	5 th sem (Hons)	Course – III	The Sino-soviet rift	01
	()	Issues of the Contemporary World	f the porary And tensions within the east European Soviet Bloc: Hungary, Czechoslovakia, and Poland	03
		wond	Glasnost- Perestroika and collapse of Soviet socialism	02
			End of the cold war and German reunification	02
		ВА	Unit-2: The Maurya rule in Magadha	03
		(General	Asoka's Dhamma and administration	02
	1 st sem	Program) in History	The post Maurya India of the Kushanas, Satavahanas and Tamil powers	04
T (T 7	(General)	Course – 1	Splits in Jainism and Buddhism	02
Jayanta Kar	Note: Also 1 st	History of India from	Vaishnavism, Saivism	02
	sem Hons GE	the Earliest	Palas and Senas in Bengal	03
	as per BoS guidelines times to the Early Medieval Period	times to the Early	Kingdoms of the South – The Pallavas, Rashtrakutas, Chalukyas and Cholas	04
		Changes in Polity, Society, Economy, Religion and Culture - towards transition	04	

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Curriculum Plan of Kartik Chandra Das for odd Semesters Department of History Dumkal College						
Name of Teacher	Year	Course	Content	No of Period		
		Course- II	Unit-3: The Polis and slave society of ancient Greece	04		
Kontik Chondro	1st som	Social Formation and	Rise of ancient Rome	03		
Das	(Hons)	pattern of the	Decline of the Roman Empire	03		
		early Medieval World	Agrarian economy and trade	02		
			The Church and the question of religion	02		
			Unit-4: Women's rights in India The question of women's empowerment	01		
		Conorio		01		
Kartik Chandra	1st sem GE	Generic Elective Course – I U	02			
Das	(Hons)	Human Rights in India	Violence against women	No of Period 04 03 03 03 02 01 02 01 02 01 02 01 02 03 05		
			Protective laws	01		
			Protests and movements	02		
Kartik Chandra Das	1st sem GE (Hons)	Generic Elective Course – II History of Indian Environment	Unit-2: Indigenous knowledge system animal ethics social formation and collective management of rivers, forests and hills in pre-colonial India.	05		



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			Unit-3: Economy of Sultanate India	02
Kartik Chandra Das 3 rd sem (Hons)	ord	Course – V The Delhi	Changes in land revenue administration of Sultanate India	03
	3 rd sem (Hons)	Sultanate in Retrospect	New agrarian relation of Sultanate India	03
		Kenospeer	Industry and urbanization of Sultanate India	04
		Trade and currency of Sultanate India	04	
	ord	Course - VI	Unit-3: Reformation – origin, course and results	06
Kartik Chandra (Hons) Das	(Hons)	Rise of the Modern West	Progress of the movement from Luther to Calvin	06
		The counter Reformation.	03	
Kartik Chandra	3 rd sem	3 rd sem (Hons) Course – VII Europe in Transition	Unit-3: American War of Independence	03
Das	(Hons)		Birth of new democratic politics	02
Kartik Chandra	3 rd sem	Skill Enhancement Elective Course	Unit-3: The colonial period – western influences on Indian Art and architecture	03
Kartik Chandra Das	(Hons)	Course – I Understanding Heritage, Art and architecture of India	Changes in the post-colonial period	03



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			Unit-2: Exploitation and resistance	01		
			De-peasantization and de- industrialization	02		
	3 rd sem	Course – III	Drain of wealth	01		
Kartik Chandra	(Programme)	Modern India	Famines in India	01		
Das	sem GE for hons	till IndependenceResistance from the tribes and peasant till the Revolt of 1857Analysing the revolt and its aftermath	Resistance from the tribes and peasants till the Revolt of 1857	03		
			Analysing the revolt and its aftermath	02		
		Colonial policy of further exploitation through railways and industrial network.	02			
Kartik Chandra 5 th sem Das (Hons)	Course - XI History of	Unit-2: Expansion and Consolidation of British Rule with special reference to Bengal,	03			
	_th	Modern India	Maharashtra, Mysore, Punjab and Awadh	05		
	(Hons)	from the beginning of colonial rule to the Great RevoltColonial state and its ideology - rule of law,Orientalism, Utilitarianism	Colonial state and its ideology - rule of law,	01		
			Orientalism,	02		
			Utilitarianism	02		
			Unit-1: The cultural revolution of the nineteenth century	02		
			nineteenth century Critique of Young Bengal Movement			
		Course – XII	Bengal Renaissance, social and religious reforms	03		
	.41	History of	Colonisation of education	02		
Kartik Chandra Das	5 th sem (Hons)	Modern India from	The women's question	02		
		Renaissance to Independence	Different political parties and their ideologies	02		
			Role of Gandhi, Tagore, Subhas Bose, Nehru and Jinnah –	04		
			Workers' and peasants' movements	03		



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Kartik Chandra Das 5 th sem (Hons)	DSE Course – II History of Japan from Meiji Restoration to	Unit-2: Popular and democratic movements Satsuma rebellion Popular rights movement	01 01 01	
		the Second World War	Meiji constitution.	04
Kartik Chandra Das 5 th sem (Hons)	DSE Course – III	Unit-4: From Bi-polarism to Uni- polarism - globalization and its impact on culture and society	03	
	(Hons) Issu Cont	Issues of the Contemporary World	Information revolution and its impact of the present-day world	02
		B.A. (General	Unit-3: Age of the Guptas	03
	1 st sem	Program) in	Consolidation of Magadhan empire	03
	(General)	Course – 1	Debates on golden age	02
Kartik Chandra Das	Note: Also 1 st	History of India from the	Brahminical revival and growth of feudalism	03
	as per BOS guidelines	Earliest times to the Early Medieval Period	Decline of the Gupta power and beginning of political decentralization of India; Assessing Harshavardhana as the last great emperor	04

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Curriculum Plan of Manas Kumar Das for Even Semesters					
		Department of	History		
		Dumkal Co	llege		
Name of Teacher	Year	Course	Content	No of Period	
Manas Kumar Das	2nd sem (Hons)	Course-III Ancient India from	Unit-2: The post-Maurya India of the Kushanas	04	
		the Maurya to Late Gupta period	Satavahanas and Tamil powers, Chera, Chola and Pandya	06	
			New trends in economy and society – peasantization of tribes and changes in the caste system	03	
			spread of megalithic culture	03	
			splits in Jainism and Buddhism	04	
			Vaishnavism, Saivism and Tantricism	06	
Manas Kumar Das	2nd sem (Hons)	Course-IV History of Early Medieval India	Unit-4: Northern India under the Delhi Sultanate - the Turkish invasions from 997 to 1206 AD	04	
			Consolidation of the Sultanate from 1206 to 1286 AD	08	
			The Khalji Revolution and the omnipotent state under the Khaljis	06	
			The Tughluq period of reforms and counter reforms	05	
			Decline of the Delhi Sultanate	03	
Manas Kumar Das	2nd sem (Hons GE)	B.A. (General Program) in	Unit – 4: Mughal India in retrospect - state and religion	6	
	(Gen)	History & Also 2 nd sem (Hons GE) Course – II History of Medieval India	Evolution of the administrative system- mansab and jagir	6	
			Management of land and agriculture	5	
			Features of urban economy, trade and industry	6	
			Society and culture – religion of the masses - language, music and literature; art and architecture.	10	

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Manas Kumar Das 4 th (H	4th semCourse - VIII(Hons)History of MughalIndia	Unit-2: Making of the Mughal State from Akbar to Aurangzeb	12	
			State and religion	5
			Management of land and agriculture	6
		Evolution of the administrative system - mansab and jagir	6	
			The Mughal ruling classes - nobility and zamindars	6
			The peasants and village community	6
Manas Kumar Das	r Das 4 th sem Course – IX (Hons) History of Late Mediavel India	Unit-2: Regional polity – the Marathas under Shivaji and the Peshwas	8	
		Weale var mara	The Sikh challenge	3
Manas Kumar Das	ar Das 4 th sem (Hons) Course - X (Hons) Rise of Modern Europe	Unit-2: The eighteenth-century background to the French Revolution - society, economy, and polity;	8	
			The philosophers and the ideological revolution.	4
Manas Kumar Das	Kumar Das4th semSkill Enhancem(Hons)Elective Course	Skill Enhancement Elective Course	Unit-4: Modern Bengali Music – post- colonial western influences –	4
		(For both Honours and General)	middle class romanticism and transformation of Bengali music –	3
		The Bengal Music	leftist movements and new forms of music – media and music – Bengali music in theatre and film –	4
			globalization and changes in musical forms – rock and band music	4
Manas Kumar Das	4 th sem (Hons)	Skill Enhancement Elective Course	Unit-4: Internet - brief history, internet today - protocols and standards -	5
		Course – II Studies in Electronic Communication System	reference models: OSI reference model, TCP/IP reference model, their comparative study	5
Manas Kumar Das	^{4th} sem (Gen)	B.A. (General Program) in	Unit-1: Renaissance and Reformation - socio-economic roots	6
		History & Also 4 th sem (Hons GE)	Secularism and humanism	6

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		Course – IV (History of Europe	Art, architecture, science and literature	8
		from the Fifteenth to the Twentieth Century)	The printing revolution	3
Manas Kumar Das	^{6th} sem	Course – XIII Modern Europe: From Nationalism to	Unit-2: The economic revolutions, consolidation of capitalism	4
	(110113)	Socialism	Formation of big national states in Germany and Italy	6
			Imperial advances before and after Bismarck	4
			Developments in eastern Europe	4
Manas Kumar Das	^{6th} sem (Hons)	Course – XIV Trends in World Politics from the	Unit-2: Roots of European imperialism and the World Wars as the total war	5
		First to the Second World War	Impact of war on European mind	2
			Peace settlement of 1919 and search for the collective security	4
			The League of Nations	3
Manas Kumar Das	^{6th} sem (Hons)	Discipline Specific Elective Course Course - I	Unit 2: Political transformation in East Pakistan	3
		History of Bangladesh from Liberation to the	Emergence of linguistic nationalism since 1952	3
		present day	Resistance against Pakistani militarism	4
			Rise of Sheikh Mujibur Rahaman as the new mass leader	4
			Awami League Movement, 1966 to 1970	5
			Bangladesh liberation movement of 1971 – birth of Bangladesh in 1972	5
Manas Kumar Das	^{6th} sem (Hons)	Discipline Specific Elective Course	Unit-4: Emerging new woman in post- colonial India	2
		History of Women in India	Women's organizations and fight against their marginalization	3



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			Women in Indian literature and performing art	3
Manas Kumar Das	^{6th} sem (Hons)	6 th sem Hons GE Course – II	Unit –3: Agrarian crisis and the decline of the Mughal Empire	4
		History of Medieval India	Regional polity – the Marathas under Shivaji and the Peshwas	6
			The Sikh challenge	2
			Emergence of successor states – Bengal, Awadh, Mysore and Hyderabad	8
Manas Kumar Das			Unit III: The wonder that was medieval India – Delhi, Agra, Ajmer, Ahmedabad, Daulatabad, Junagarh, Lucknow, Chittor, Jaipur, Jodhpur and Jaisalmer	12



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Curriculum Plan of Manas Kumar Das for Odd Semesters Department of History				
		Dumkal C	College	No of
Name of Teacher	Year	Course	Content	Period
			Unit-3: Legacy of the Harappan Culture	02
		Course – I History of	The Aryan penetration and the Anglo- Oriental debate	03
Manas Kumar Das1st sem (Hons)Early India, from remote past to the end of the Vedic Polity	1st sem (Hons)	Early India, from remote past to the end of the Vedic Polity	Beginning of iron age and settled agriculture - patterns of settlement and cultural changes	05
			Emergence of caste society, organized religion and state territoriality	05
	The Vedic literature	02		
	1st sem (Hons)	Course- II Social Formation and Cultural pattern of the Ancient and early Medieval World	Unit-2: Bronze Civilizations of Egypt	04
			Mesopotamia	04
Manag Kuman Dag			China	03
Manas Kumar Das			Eastern Mediterranean lands.	03
			Sufi culture	02
		Generic	Unit-1: Basic concepts and theories of human rights	01
Manas Kumar Das	1st sem GE (Hons)	Elective Course – I Human Rights in India	Social structure and the question of human rights in India, gender, caste, class and religion	03
			State and human rights, politics and economic policies.	02



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Manas Kumar Das	1st sem GE (Hons)	Generic Elective Course – II History of Indian Environment	Unit-4: Political economy of environment in postcolonial India industry and pollution Development vs. environment debate Various environmental movements.	05
			Unit-2: Delhi on the eve of the Mughal ascent - Timur's invasion –	02
			The Sayyids and Lodis	02
		Course – V	Babur's adventure	02
	3 rd sem (Hons)	The Delhi Sultanate in Retrospect	Babur's central Asian connection	01
Manas Kumar Das			Humayun's misfortune	01
			Sher Shah Sur and Afghan rule in India	03
			Development of bhakti and Sufi philosophy	04
			Language, literature, art and architecture	04
			Unit-2: Socio-economic roots of Renaissance - spread of new social	
			ideas	03
Manas Kumar Das	3 rd sem	Course - VI Rise of the Modern West	Secularism and Humanism of Renaissance	04
	(noiis)		Art, architecture, science and literature during Renaissance	05
			The printing revolution	02



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		Skill Enhancement Elective	Unit-4: The Bengal School of art and architecture – Birbhum, Bankura and Bishnupur Gharana	03
Manas Kumar Das	3 rd sem	Course Course – I	Art Movements – Santiniketan style - Progressive Artists' Group	03
	(110115)	Understanding Heritage, Art and	Major artists and their works	03
		architecture of India	Popular art forms – folk art traditions	02
		Skill Enhangement	Unit-4: Sports in post-colonial India	03
Manas Kumar Das		Elective	sports in education	02
	$3^{\rm rd}$ sem	Course	Sports and economy	02
	(Holis)	Sports and Society in India in Historical Perspective	Sports and politics	02
			Sports and diplomacy	02
			Effects of globalization on Indian sports	02
	3 rd sem (Hons) G E	Generic Elective Course – V	Unit-2: The society – the Chaitanya Movement and revolution in culture and literature	02
Manas Kumar Das		Regional History of Bengal – Nadia and Murshidabad	The rich tradition of indigenous education	02
			Minor religious sects and folk culture of Nadia.	02
			Unit-4: Interpreting Indian nationalism	02
	3rd sem	Course – III	Swadeshi movement and different phases of the nationalist struggle	02
Manas Kumar Das	(Programme) & also 3 rd	History of Modern India	Role of Gandhi, Tagore, Subhas Bose, Nehru and Jinnah	04
	sem GE for hons	Independence	Workers' and peasants' movements	02
			Religious polarisation of national politics	02
			Partition and independence (1947)	02



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			Unit-1: Understanding Modern Indian History	02
		Course - XI History of Modern India	Historiography, concepts, terminologies, approaches.	07
Manas Kumar Das	5 th sem	from the	peasants and landless labourers	01
	(Hons)	colonial rule to the Great	Detribulization and the environmental question	02
		Revolt	De-industrialization,	03
			Rural credit and indebtedness	02
		Course – XII	Unit-2: Re-industrialisation of India following the spread of railway network	02
Manas Kumar Das 5 th sem (Hons)	5 th sem	History of Modern India from Renaissance to Independence	Colonial fiscal policy and the balance of Indian trade	02
	(110110)		Rise and growth of the Indian capitalist and working class.	02
	5 th sem (Hons)	DSE Course – I History of China from Tradition to Revolution	Unit-2: Confronting the foreigners - Opium Wars	02
			Treaties with imperialist powers	01
Manas Kumar Das			Foreigners' struggle for concessions in China	02
			China as an 'informal colony'	01
			Increasing western pressure - the open- door policy	02
			Transformation of China from a feudal society to a semi-colonial and semi-feudal society.	02
		DSE	Unit-4: Rise of political parties in Japan	
Manas Kumar Das		Course – II	and their failure to sustain democratic system	03
	5 th sem (Hons)	History of Japan from Meiji Restoration to the Second World War	Japan and the two World Wars	04



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P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406

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5 th sem		DSE	Unit-3: Oil politics and the Arabian world: Israel, Palestine, Iran and Iraq	04
Manas Kumar Das (Hons) (Hons) Issues of the Contemporar World	Course – III Issues of the Contemporary World	Nuclear diplomacy in the twentieth century world	04	
		B.A. (General	Unit-1: Sources and interpretation	02
	1 st sem (General) Note: Also 1 st sem Hons GE as per BOS guidelines	History Course – 1 History of India from the Earliest times	Broad survey of paleolithic, mesolithic and neolithic cultures	03
Manas Kumar Das			The Harappan Civilisation	03
			Journey from the Vedic state to the 16 Mahajanapadas	02
		Medieval Period	From the age of the Vedas to the age of Jainism and Buddhism.	04

Jayanta Kar.

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Curriculum Plan of Sanchita Mondal for Odd Semesters Department of History Dumkal College				
Name of Teacher	Year	Course	Content	No of Period
C	Course – I History of	Unit-4: The non-Vedic political economy of the 16 Mahajanapadas	03	
Sanchita Mondal	1st sem (Hons)	Early India, from remote	Spread of protestant religions – Ajivikism, Jainism and Buddhism	05
		of the Vedic	Commercial and urban growth of India	03
	Pointy	Rise of Magadha as an imperial power.	04	
Sanchita Mondal1st sem (Hons)Course- II Social Formation and Cultural pattern of the	Course- II	Unit-1: Pre-historic and proto-historic cultures beyond India	03	
	1 st corre	Social Formation and Cultural pattern of the Ancient and early Medieval	Beginning of agriculture and animal husbandry	03
	(Hons)		Searches into the history of Africa	03
			The Aztec Civilization	03
		wond	The Inca Society	03
			Unit-4: Ideas of state and kingship	02
		Course – V	Moves from theocracy to secular administration	03
Sanchita Mondal	3 rd sem (Hons)	The Delhi Sultanate in Retrospect	Development of bhakti and Sufi philosophy	04
			Language, literature, art and architecture	04
			The printing revolution	02



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			Unit-4: From the age of Enlightenment to the Age of Liberalism	02
Sanchita Mondal	3 rd sem (Hons)	Course – VII Europe in Transition	From feudalism to capitalism	02
			The transition debates.	03
		Skill Enhancement Elective	Unit-1: Concepts and theories – Sports and History	03
Sanchita Mondal	3 rd sem (Hons)	Course Course – II Sports and	Greek Philosophy of Sports – Greek and Roman tradition of Sports	04
	Society in India in Historical Perspective	The Olympics	02	
3 rd sen (Hons Sanchita Mondal G E		Generic Elective Course – V Regional History of Bengal – Nadia and Murshidabad	Unit-1: Nadia in the post-Gupta period – as a Pargana in medieval India	03
	3 rd sem (Hons)		Colonial settlement and socio-economic changes	02
	GE		partition of India and birth of the present Nadia district.	02
			Land revenue settlements and results thereof.	02
			Unit-3: The cultural revolution of the nineteenth century	02
	3 rd sem	Course – III History of	Critique of Young Bengal Movement	02
Sanchita Mondal	(Programme) & also 3 rd sem GE for	Modern India till	Bengal Renaissance, social and religious reforms	02
	hons	Independence	Colonisation of education	01
			The women's question	02



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			Unit-3: Rural Economy and Society	01
			Land revenue settlements	01
			Agrarian structure and	01
Sanchita Mondal5th sem (Hons)Course - XI History of Modern India from the beginning of colonial rule to the Great Revolt		Course - XI	Transformation debate	02
	.4	Modern India	Commercialization of agriculture	01
	5 th sem (Hons)	from the beginning of	Rural stratification thesis	01
		colonial rule to the Great	peasants and landless labourers	01
		Revolt	Detribulization and the environmental question	02
			De-industrialization,	03
	Rural credit and indebtedness	02		
Sanchita Mondal	5 th sem (Hons)	DSE Course – I History of China from Tradition to Revolution	Unit-4: Development of Chinese industrial economy and growth of the Chinese proletariat	04
			Spread of communism among the proletariat in between the world wars - Chiang Kai Shek	02
			Kuomintang and the united front - break with the front	02
			The mature phase of Chinese communist movement under Mao Tse Tung - the Long March and the Communist Revolution of China.	04
		DSE	Unit-1: De–colonization of Asia and Africa	02
	5 th sem	Course – III	Emergence of the Third World	02
Sanchita Mondal	(Hons)	Issues of the Contemporary	Struggle for survival in Asia	02
		World	And apartheid in Africa.	03

Jayanta Kar.

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Principal Dumkal College Dumkal, Murshidabad

Department of English

Lesson Plan

Name of the Teacher: Abida Sultana

Year: 2018

Part: II

Paper: III

Sections	Торіс	Topics of Discussion	Number of
			Classes
History	Prose	1) Essays: religious	3
		and historical	
		2) Counsel literature,	
		satire	
		3) Fiction, translation	
Drama	"Macbeth".	 Introduction to 	20
	William	tragedy	
	Shakespeare.	2) Shakespearean	
		drama	
		3) Renaissance spirit	
Prose	"Of Unity in	1) The value of unity	2
	Religion".	2) Tolerance and	
	Francis Bacon.	Moderation	
		3) Practical wisdom	
Prose	"Of Plantations".	1) Purpose of	2
	Francis Bacon.	plantation	
		2) Choice of location	
		3) Governance and	
		order	

Part: II

Paper: IV

Sections	Торіс	Topics of Discussion	Number of Classes
History	Prose	1) Satire	4
		2) Periodical Essay	
Novel	"Gulliver's	1) Satirical novel	15
	Travels (Bks. I	A voyage to Lilliput	
	& II)″.	3) A voyage to	
	Jonathan	Brobdingnag	
	Swift.		
Essay	"On Idleness"	1) The Nature of	2
	[Idler31].	Idleness	
	Samuel	2) Causes of Idleness	
	Johnson.	Effect of Idleness	

Part: III

Paper: V

Sections	Торіс	Topics of Discussion	Number of Classes
History	Poetry	1) Lyric	6
		2) Narrative	
Poetry	"Ode to A	1) Transience and	3
	Nightingale".	Immortality	
	John Keats	2) Natureand Art	
		Morality and	
		death	
		Escape and	
		reality	
Poetry	"Eve of St Agnes".	1) Fantasy and	5
	John Keats	reality	
		2) Ritual and	
		Superstition	
		3) Escape and	
		transformation	
Poetry	"Excerpt from Don	1) Satire and	3
	Juan" Stanzas 22-29;	humour	
	11.169 232.	2) Picaresque	
	George Gordon	structure	
	Byron	3) Heroic couplet	
		and ottavarima	
		4) Social Critique	

Part: III

Paper: VI

Sections	Торіс	Topics of Discussion	Number of Classes
History	Prose	1) Novel	4
		2) Essay	
Poetry	"Ulysses". Tenyson	1) Dramatic	3
		Monologue	
		2) Victorian spirit	
		3) Spirit of Heroism	
		and Leadership	
		4) Yearning for	
		Immortality and	
		Legacy:	
Poetry	"My Last Duchess".	1) Dramatic	3
	Robert Browning	Monologue	
		2) Character of the	
		Duke	
		3) Themes of Power	
		and Control	
		4) Art and	
		Aesthetics	
Poetry	"God's Grandeur".	1) Sonnet	2
	Gerard Manley	2) Celebration of	
	Hopkins	God's Presence	
		3) The Glory of	
		Creation:	
		4) Renewal and	
		Redemption	
		5) Innovative	
		Language and	
		Form	
		6) Environmental	
		and Spiritual	
Duran	(()	inemes	20
Drama	"Arms and the	1) Satirical	20
	IVIan"	Exploration of	
	George Bernard	vvar and	
	Snaw.	Komance	
		 Liass and Social 	

Commentary 3) Themes of
Identity and
Honor
4) Humor and
Language

Part: III

Paper: VII

Sections	Торіс	Topics of Discussion	Number of Classes
History	 Brief Historical Outline Brief socio- cultural history 	 First World War Second World War 	5
Poetry	"Second Coming". W. B. Yeats	 Apocalyptic Imagery Historical Context Cycle of History Spiritual and Mystical Themes Language and Structure 	3
Poetry	"Hollow Men". T. S. Eliot	 Epigraph and Opening Lines Fragmented Structure: Allusions and References Theme of Spiritual Emptiness Ambiguity and Interpretation 	3
Poetry	"Bagpipe Music". Louis Macneice	 Whimsical and satirical piece Contrast between Tradition and Modernity Themes of Identity and Cultural 	2

Stereotypes			
		Stereotypes	

Semester: 1st

Course Code/ Unit	Торіс	Topics of	Number of Classes
		Discussion	
ENGH-H-CC-T-1/B	Sudraka. "Mricchkatika".	 Brief Introduction of classical Sanskrit Drama Brief	10
ENGH-H-CC-T-2/A	Horace. "Epistle I".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Homer. "The Iliad".	 Epic: Introduction. Concept of honor Heroism and the main characters 	10

Part: III

Paper: V

Sections	Торіс	Topics of Discussion	Number of
			Classes
History	Drama	 Tragedy Tragedy Classical Tragedy Tragedy in the Elizabethan Period Modern Tragedy Tragicomedy Tragicomedy Comedy Comedy of Humors Romantic Comedy Comedy of Manners Farce 	2
Prose	"Going on a Journey"-William Hazlitt.	 Joy of Solitude Escape from Routine Reflection and Introspection Connection with Nature Sense of Discovery 	3
Prose	"The Literature Of Knowledge And The CA Literature Of Power". Thomas De Quincey.	 Informative Function Didactic Purpose Transient Impact Aesthetic and Emotional Impact Enduring Influence Transformative Nature 	4
Novel	"Northanger Abbey." Jane Austen.	 Parody of Gothic Novels Catherine Morland 	15

3) Reality vs.
Imagination
4) Coming of Age
5) Meta-Fictional
Elements

Part: III

Paper: VI

Sections	Торіс	Topics of Discussion	Number of
			Classes
History	Poetry	1) Epic Poetry	3
		2) The Ode	
		3) The Sonnet	
		a) Italian Sonnet	
		b) English Sonnet	
		c) Spenserian Sonnet	
		4) Mock-Epic	
Novel	"David Copperfield."	1) Bildungsroman	20
	Charles Dickers.	2) Autobiographical	
		Elements	
		3) Character	
		Development	
		4) Social Class and	
		Mobility	
		5) Resilience and	
		Perseverance	
		6) Social Critique	
		7) Redemption and	
		Forgiveness	
		8) Virtue and vice	

Part: III

Paper: VII

Sections	Торіс	Topics of	Number of Classes
		Discussion	
History	Drama		3
Prose	"The Ox".	1) Themes of	4
	H.E Bates.	hardship,	
		dignity, and	
		sacrifice in	
		rural England	
		2) Dignity in	
		Labor	
Prose	"The Fly".	1) Grief and Loss	2
	Katherine Mansfield.	2) Power and	
		Control	
		Resilience and	
		Futility	
Prose	"The Englishman's	1) Theme of	3
	House".	Home and	
	Evelyn Waugh.	Identity	
		2) Satire and	
		Humor	
		3) Englishman	
		Archetype	
		4) Tradition and	
		Modernity	
		5) Anecdotal	
Drama	"Look Back in Anger".	1) Kitchen sink	20
	John Osborne.	drama	
		2) Anger and	
		Disillusionmen	
		t	
		3) Angry Young	
		Man	
		4) Alienation	
		5) Class conflict	
		6) Critique of the	
		Establishment	
		7) The Bear and	

		
	Squirrel Game	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	IlangoAdigal. " The Book of Banci "	 Introduction to Epic and Tamil Epic Themes of the poem Feministic perspective 	15
ENGH-H-CC-T-1/B	Sudraka. "Mricchkatika".	 Brief Introduction of classical Sanskrit Drama Brief	10
ENGH-H-CC-T-2/A	Plautus. "Pot of Gold".	 Folklore and mythology Introduction to the Author and his Age Textual Analysis 	15

Semester: 1st

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-1/B	Kalidasa.	1) History of	15
	"AbhijnanaShakuntalam".	Indian Classical	
		Drama	
		2) Rasa Theory	
		3) Textual Analysis	
ENGH-H-CC-T-2/A	Plautus.	1) Folklore and	15
	"Pot of Gold".	mythology	
		Introduction to	
		the Author and	
		his Age	
		3) Textual Analysis	
Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/ A	Salman Rushdie.	1) Symbolism of	7
	"The Free Radio"	Free Radio	
		2) Satirical	
		commentary	
		3) Cultural context	
ENGH-H-CC-T-3/A	Nissim Ezekiel.	1) India writing in	3
	"Enterprise"	English	
		2) Title of the	
		poem	
		3) Textual Analysis	
ENGH-H-CC-T-3/A	Jayanta Mahapatra.	1) Introduction to	3
	"Dawn at Puri"	the Author	
		2) Textual Analysis	
ENGH-H-CC-T-4/A	FransisBacon	1) Short	5
	"Of Empire"	Introduction on	
		Essay	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topics	of discussion	Number of classes
ENGH-H-CC-T-5/A	Walt Whitman.	1)	Spirituality and	3
	"Passage to India"		Transcendence	
		2)	Philosophical	
			Reflection	
ENGH-H-CC-T-5/A	Adrienne Rich.	1)	Concept of	3
	"Power"		Power	
		2)	Feminist	
			Perspective	
		3)	Textual Analysis	
ENGH-H-CC-T-5/A	Allen Ginsberg.	1)	Spirituality	5
	"An Eastern Ballad"	2)	Self discovery	
ENGH-H-CC-T-6/B	Lewis Carroll.	1)	World building	10
	"Through the Looking		and fantasy	
	Glass".	2)	Absurdity of	
			language and	
			logic	
		3)	Textual Analysis	
ENGH-H-CC-T-7/A	Alexander Pope.	1)	Mock Heroic	7
	"The Rape of the		Epic	
	Lock".	2)	Textual Analysis	
ENGH-H-CC-T-7/A	John Webster.	1)	Theatrical	7
	"The Duchess of		elements	
	Malfi".	2)	Morality and	
			Ethics	
		3)	Reception and	
			legacy	

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/A	Thomas Gray.	1) Introduction to	5
	"Elegy Written in a	Elegy	
	Country Churchyard"	2) Romantic	
		elements	
		Neo classical	
		elements	
ENGH-H-CC-T-9/A	John Keats.	1) Concept of	5
	" Ode to a	beauty	
	Nightingale", "Bright	Escape and	
	Star", "To Autumn"	immersion	
		3) Textual Analysis	
ENGH-H-CC-T-10/B	Thomas Hardy.	1) Concept of Fate	5
	"Tess of the	Social injustice	
	d'Urbervilles".	3) The struggle of	
		the working	
		class	

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of classes
Unit			
ENGH-H-CC-T-11/A	Sylvia Plath. "Daddy", " Lady Lazarus "	 Confessional poetry Discussion on Sylvia Plath's life and her works 	5
ENGH-H-CC-T-11/A	Katherine Mansfield. "Bliss"	 Upper society in England Feminist Perspective Homosexuality 	3
ENGH-H-CC-T-12/A	Wystan Hugh Auden. "Unknown Citizen"	 Conformist society Good citizen Textual Analysis 	3
ENGH-H-CC-T-12/B	Joseph Conrad. "Heart of Darkness".	 1) Novella 2) Imperialism 3) Human darkness 	4
ENGH-H-DSE-T-2/B	George Orwell. "Animal Farm".	 Allegory Political Allegory Russian Revolution 	5
ENGH-H-DSE-T-3/A	William Wordsworth. "Preface" to the Lyrical Ballads.	 Language Diction Imagination Role of the Poet Purpose of Poetry 	6
ENGH-H-DSE-T-3/B	S.T. Coleridge. "Biographia Literaria".	 Autobiography and literary analysis Primary and Secondary Imagination Fancy and Imagination Nature of Poetry 	5

Semester: 1st

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-	Kalidasa.	1) History of Indian	15
1/B	"AbhijnanaShakuntalam".	Classical Drama	
		2) Rasa Theory	
		Textual Analysis	
ENGH-H-CC-T-	Plautus.	1) Folklore and	15
2/A	"Pot of Gold".	mythology	
		2) Introduction to the	
		Author and his Age	
		Textual Analysis	

Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/ A	Amitav Ghosh. " The Ghosts of Mrs Gandhi "	 Historical context Environmental concerns Global Challenges Civil Disobedience Critique and Reflection 	15
ENGH-H-CC-T-3/ A	Salman Rushdie. "The Free Radio"	 Symbolism of Free Radio Satirical commentary Cultural context 	7
ENGH-H-CC-T-3/B	Anita Desai. "In Custody".	 Cultural conflict Personal transformation Relationships dynamic 	10
ENGH-H-CC-T-4/A	Geoffrey Chaucer. "Wife of Bath"	 Introduction to the Text Textual Analysis Feminist Perspective 	7

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Adrienne Rich.	1) Concept of	3
	"Power"	Power	
		2) Feminist	
		Perspective	
		Textual Analysis	
ENGH-H-CC-T-5/A	Abraham Lincoln.	1) Slavery system	3
	"Gettysburg Address"	in America	
		Introduction to	
		the Text	
ENGH-H-CC-T-6/B	Lewis Carroll.	1) World building	10
	"Through the Looking	and fantasy	
	Glass".	Absurdity of	
		language and	
		logic	
		3) Textual Analysis	

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/B	William Congreve.	1) Introduction to	10
	"The Way of the	the Text	
	World".	2) Comedy of	
		Manners	
		3) Restoration	
		comedy	
ENGH-H-CC-T-9/A	John Keats.	1) Concept of	5
	" Ode to a	beauty	
	Nightingale", "Bright	Escape and	
	Star", "To Autumn"	immersion	
		Textual Analysis	
ENGH-H-CC-T-10/A	Christina Rossetti.	1) Introduction of	4
	"The Goblin Market".	the Age	
		2) Victorian	
		Morality	
		3) Themes of	
		Temptations	
		and desire	
ENGH-H-CC-T-10/B	Charlotte Bronte.	1) Discussion on	4
	"Jane Eyre".	Jane Eyre	
		2) Feminist	
		Perspective	
		3) Textual Analysis	

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-11/A	Sylvia Plath.	1) Confessional	5
	"Daddy", " Lady	poetry	
	Lazarus "	2) Discussion on	
		Sylvia Plath's life	
		and her works	
ENGH-H-CC-T-11/A	Katherine Mansfield.	1) Upper-class	3
	"Bliss"	society in England	
		2) Feminist	
		Perspective	
		Homosexuality	
ENGH-H-CC-T-12/A	Wystan Hugh Auden.	1) Conformist	3
	"Unknown Citizen"	society	
		Good citizen	
		Textual Analysis	
ENGH-H-CC-T-12/B	Joseph Conrad.	1) Novella	4
	"Heart of Darkness".	2) Imperialism	
		Human darkness	
ENGH-H-DSE-T-2/B	George Orwell.	1) Allegory	5
	"Animal Farm".	2) Political Allegory	
		3) Russian	
		Revolution	
ENGH-H-DSE-T-3/A	William Wordsworth.	1) Language	6
	"Preface" to the	2) Diction	
	Lyrical Ballads.	3) Imagination	
		Role of the Poet	
		Purpose of Poetry	
ENGH-H-DSE-T-3/B	S.T. Coleridge.	1) Autobiography	5
	"Biographia	and literary	
	Literaria".	analysis	
		2) Primary and	
		Secondary	
		Imagination	
		3) Fancy and	
		Imagination	
		4) Poetry and the	
		Poet	

Semester: 6th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-13/B	Eugene Ionesco, "Rhinoceros"	1) Absurdity and Surrealism	10
		2) Conformity and	
		Mass Movement	
		3) Textual Analysis	10
ENGH-H-CC-1-13/B	"Six Characters in	1) Meta-theatrical	10
	Six Characters in	2) Identity and	
	Search of an Author .	reality	
	Chinun Anhaha	3) Theatrical Illusion	
ENGH-H-CC-1-14/B	"Things Fall Apart"	1) Exploration of	5
	Things Fall Apart .	COIOMAIISM,	
		2) Cultural luentity,	
		complexities of	
		human	
		ovnorionco	
		 Textual Analysis 	
ENGH-H-DSE-T-4/B	Feminism: h	1) Concent of	5
		Feminism	
	"When the Goods	2) French Feminism	
	Get Together"	3) Freud's	
		Phallocentric	
		Theory	
		4) Women as	
		Commodities	
		5) Homosexuality	
ENGH-H-DSE-T-5/A	DibyenduPalit,	1) Introduction	4
	"Alam's Own House".	2) Family dynamics	
		3) Cultural context	
ENGH-H-DSE-T-5/A	Manik	1) Introduction	7
	Bandyopadhyay,	2) Quest for Identity	
	"The Final Solution".	3) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-2/A	Plautus. "Pot of Gold".	 Folklore and mythology Introduction to the Author and his Age Textual Analysis 	15

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/ A	Salman Rushdie.	1) Symbolism of	7
	"The Free Radio"	Free Radio	
		2) Satirical	
		commentary	
		3) Cultural context	
ENGH-H-CC-T-3/A	Nissim Ezekiel.	 India writing in 	3
	"Enterprise"	English	
		2) Title of the	
		poem	
		3) Textual Analysis	
ENGH-H-CC-T-3/A	Jayanta Mahapatra.	1) Introduction to	3
	"Dawn at Puri"	the Author	
		2) Textual Analysis	
ENGH-H-CC-T-4/A	Francis Bacon.	1) Short	5
	"Of Empire"	Introduction on	
		Essay	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Walt Whitman.	1) Spirituality and	3
	"Passage to India".	Transcendence	
		Philosophical	
		Reflection	
ENGH-H-CC-T-5/A	Adrienne Rich.	1) Concept of	3
	"Power".	Power	
		2) Feminist	
		Perspective	
		3) Textual Analysis	
ENGH-H-CC-T-5/A	Allen Ginsberg.	1) Spirituality	5
	"An Eastern Ballad"	2) Self discovery	
ENGH-H-CC-T-6/B	Lewis Carroll.	1) World building	10
	"Through the Looking	and fantasy	
	Glass".	2) Absurdity of	
		language and	
		logic	
		3) Textual Analysis	
ENGH-H-CC-T-7/A	John Webster.	1) Theatrical	7
	"The Duchess of	elements	
	Malfi".	2) Morality and	
		Ethics	
		3) Reception and	
		legacy	

Semester: 4th

Course code/ Unit	Торіс	Topics of	f discussion	Number of classes
ENGH-H-CC-T-8/A	Samuel Johnson.	1) Inti	roduction	4
	" London"	2) Sar	muel	
		Joh	nnson's	
		wri	iting and his	
		cor	ntribution	
		3) Tex	xtual Analysis	
		4) Crit	itical Analysis	
ENGH-H-CC-T-8/A	Eliza Heywood.	1) Inti	roduction to	7
	"Fantomina".	the	e Text	
		2) Fer	minist	
		Ар	proach	
		3) Crit	itical Analysis	
ENGH-H-CC-T-9/B	George Gordon	1) Byr	ronic hero	5
	Byron.	2) Tra	avelogue and	
	"Childe Harold's	exp	ploration	
	Pilgrimage"	3) The	eme of	
		Alie	enation and	
		Exi	ile	
ENGH-H-CC-T-9/B	Mary Shelley.	1) Go [.]	othic fiction	5
	"Frankenstein".	2) The	e monster	
		and	d human	
		3) The	eme of	
		Alie	enation and	
		hul	bris	
ENGH-H-CC-T-10/B	Thomas Hardy.	1) Coi	ncept of Fate	5
	"Tess of the	2) Soc	cial injustice	
	d'Urbervilles".	3) The	e struggle of	
		the	e working	
		clas	ISS	

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-11/A	Maya Angelou.	1) Introduction	3
	"Caged Bird"	2) Autobiographical	
		work	
		Metaphorical	
		imagery	
ENGH-H-CC-T-11/A	Mahashweta Devi.	1) Epic	4
	"Draupadi"	2) Mahabharat	
		3) Caste	
		4) Gender	
		5) Power	
ENGH-H-CC-T-12/A	William Butler Yeats.	 Background history 	5
	"Byzantium",	of Ireland	
	"Sailing to	2) Cultural context	
	Byzantium"	3) Christian Civilization	
ENGH-H-CC-T-12/B	James Joyce.	1) Coming of Age	7
	"A potrait of the	2) Stream of	
	Artist as a Young	consciousness	
	Man".	Textual Analysis	
ENGH-H-DSE-T-2/A	Ted Hughes.	 Perspective of the 	6
	"Hawk Roosting"	Hawk	
	and " Crow's Fall".	2) Natural instinct	
		Control and Mastery	
		4) Nature and Natural	
		order	
ENGH-H-DSE-T-3/A	William	1) Language	6
	Wordsworth.	2) Diction	
	"Preface" to the	3) Imagination	
	Lyrical Ballads.	4) Role of the Poet	
		5) Purpose of Poetry	
ENGH-H-DSE-T-3/B	S.T. Coleridge.	1) Autobiography and	5
	"Biographia	literary analysis	
	Literaria".	2) Primary and	
		Secondary	
		imagination	
		5) Failcy and	
		() Deathy and the Peet	
		4) Poetry and the Poet	

Semester: 6th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-	Eugene Ionesco,	1) Absurdity and	10
13/B	"Rhinoceros" .	Surrealism	
		Conformity and	
		Mass Movement	
		Textual Analysis	
ENGH-H-CC-T-	Luigi Pirandello.	1) Meta-theatrical	10
13/B	"Six Characters in Search of	2) Identity and reality	
	an Author".	Theatrical illusion	
ENGH-H-CC-T-	David Malouf.	1) Introduction	3
14/A	"Revolving Days", "Wild	2) Australian history	
	lemons".	Textual Analysis	
ENGH-H-CC-T-	Mamang Dai.	1) Cultural	4
14/A	"Small Towns and the	exploration	
	River", "The Voice of the	Sense of place	
	Mountain".	Mythology and	
		folklore	
ENGH-H-DSE-T-	Feminism: b. Luce Irigaray.		5
4/B	"When the Goods Get	1) Concept of	
	Together".	Feminism	
		2) French Feminism	
		3) Freud's	
		Phallocentric	
		Theory	
		4) Women as	
		Commodities	
		5) Homosexuality	
ENGH-H-DSE-T-	Sa'adat Hasan Manto,	1) Partition	5
5/A	"Toba Tek Singh".	2) Insanity and	
		Absurdity	
		Textual Analysis	
ENGH-H-DSE-T-	Lalithambika	1) Historical context	5
5/A	Antharajanam.	2) Feminist	
	"A Leaf in the Storm".	Perspective	
		Cultural and	
		Religious context	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/B	Sudraka. "Mricchkatika".	 Brief Introduction of classical Sanskrit Drama Brief	10
ENGH-H-CC-T-2/A	Plautus. "Pot of Gold".	 Folklore and mythology Introduction to the Author and his Age Textual Analysis 	15

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/A	Shashi Deshpande. "The Intrusion"	 Introduction to the Author Textual Analysis Feminist Perspective 	7
ENGH-H-CC-T-3/A	Kamala Das. "Introduction"	 Introduction to the Text Confessional poetry Feminist Perspective 	3
ENGH-H-CC-T-3/A	JayantaMahapatra. "Dawn at Puri".	 Introduction to the Author Textual Analysis 	3
ENGH-H-CC-T-4/A	Johne Donne. "The Sunne Rising "and "Valediction Forbidding".	 Brief Introduction to Metaphysical poet Characteristics of Metaphysical poem Textual Interpretation 	7

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Adrienne Rich.	1) Concept of	3
	"Power".	Power	
		2) Feminist	
		Perspective	
		Textual Analysis	
ENGH-H-CC-T-5/A	Abraham Lincoln.	1) Slavery system	3
	"Gettysburg	in America	
	Address".	Introduction to	
		the Text	
ENGH-H-CC-T-6/B	Lewis Carroll.	1) World building	10
	"Through the Looking	and fantasy	
	Glass".	Absurdity of	
		language and	
		logic	
		Textual Analysis	

Semester: 4th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-8/A	Thomas Gray.	1)	Introduction to Elegy	5
	"Elegy Written in a	2)	Romantic elements	
	Country	3)	Neo classical	
	Churchyard".		elements	
ENGH-H-CC-T-9/A	William Blake.	1)	Introduction of the	7
	"The Lamb" <i>,</i> "The		Era	
	Chimney Sweeper",	2)	Symbolism used in	
	"The Tyger".		the poem	
		3)	Textual Analysis	
		4)	Critical Appreciation	
ENGH-H-CC-T-9/A	Robert Burns. " A	1)	Historical context	4
	Bard's Epitaph" and	2)	Scottish	
	" Scots WhaHae".		Nationalism	
		3)	Textual Analysis	
ENGH-H-CC-T-9/A	William	1)	The poet's	5
	Wordsworth.		relationships with	
	"Tintern Abbey".		nature	
		2)	Memory and	
			reflection	
		3)	The passage of time	
ENGH-H-CC-T-10/A	Alfred Tennyson.	1)	Quest for	3
	"Ulysses".		Adventure	
		2)	Spirit of heroism	
		3)	Yearning for Glory	
ENGH-H-CC-T-10/A	Robert Browning.	1)	Introduction to	3
	"My Last Duchess".		dramatic	
			Monologue	
		2)	Characterization	
		3)	Theme of Power	
			and control	

Semester: 5th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-	Maya Angelou.	1)	Introduction	3
11/A	"Caged Bird".	2)	Autobiographical work	
		3)	Metaphorical imagery	
ENGH-H-CC-T-	Mahashweta Devi.	1)	Epic	4
11/A	"Draupadi".	2)	Mahabharat	
		3)	Caste	
		4)	Gender	
		5)	Power	
ENGH-H-CC-T-	Dovid Herbert	1)	Theme of Isolation	4
12/A	Lawrence.	2)	Family dynamics	
	"Odour of	3)	Complexities of human	
	Chrysanthemums".		relationship	
ENGH-H-CC-T-	Virginia Woolf. "	1)	Complexities of	4
12/A	Mark on the Wall".		Perception and	
			Consciousness	
		2)	Stream of	
			consciousness	
ENGH-H-CC-T-	W. Somerset	1)	Themes of morality,	5
12/A	Maugham.		hypocrisy and cultural	
	"Rain".		clashes	
		2)	Colonialism	
ENGH-H-DSE-T-	Phillip Larkin.	1)	Modernism	7
2/A	"Whitsun Weddings"	2)	Cultural context	
	and "Church Going"	3)	Textual Analysis	
ENGH-H-DSE-T-	John Osborne.	1)	Post-Modern Era	6
2/B	"Look back in	2)	Kitchen sink drama	
	Anger".	3)	Class difference	
ENGH-H-DSE-T-	William	1)	Language	6
3/A	Wordsworth.	2)	Diction	
	"Preface" to the	3)	Imagination	
	Lyrical Ballads.	4)	Role of the Poet	
			Purpose of Poetry	
ENGH-H-DSE-T-	S.T. Coleridge.	1)	Literary Autobiography	5
3/B	"Biographia	2)	Primary and Secondary	
	Literaria".		Imagination	
		3)	Fancy and Imagination	

Semester: 6th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-13/A	Henrik Ibsen. "Ghosts".	 Psychological realism Social hypocrisy The Ghost of the Past 	10
ENGH-H-CC-T-14/B	Chinua Achebe. "Things Fall Apart".	 Exploration of colonialism, Cultural identity, and the complexities of human experience. Textual Analysis 	5
ENGH-H-DSE-T-4/B	Feminism: b. LuceIrigaray. "When the Goods Get Together".	 Concept of Feminism French Feminism Freud's Phallocentric Theory Women as Commodities Homosexuality 	5
ENGH-H-DSE-T-5/A	Sa'adat Hasan Manto, "Toba Tek Singh".	 Partition Insanity and Absurdity Textual Analysis 	5
ENGH-H-DSE-T-5/A	Lalithambika Antharajanam. "A Leaf in the Storm".	 Historical context Feminist Perspective Cultural and Religious context 	5

Department of English

Lesson Plan

Name of the Teacher: Farha Khatun

Year: 2018

Part: II

Paper: III

Section	Торіс	Topic of Discussion	Number of Classes
History	Poetry	Sonnet, lyric	3
		Long poem	
		Metaphysical poetry	
Drama	"Doctor Faustus".	1) Tragedy	15
	Christopher Marlowe	2) Faustus'	
		Ambition and	
		Hubris	
		The Pact with	
		Lucifer	
		Themes of Sin	
		and	
		Redemption	
		5) Tragic Hero	
		6) Structure and	
		Style	
Poetry	"The Easter Wings".	1) Visual Form	3
	George Herbert.	2) Religious	
		Themes: The	
		poem explores	
		themes of sin,	
		redemption,	
		and spiritual	
		renewal,	
		Contrition and	
		Praise	
Prose	"Extract from A	1) Social Critique	2
	Supplication for the	2) Call for Reform	
	Beggars" [Ch. IV].	3) Historical	
	Simon Fish.	Context	

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Part: II

Paper: IV

Section	Торіс	Topic of Discussion	Number of Classes
History	Drama	1) Heroic Tragedy	5
		2) Restoration	
		Comedy	
		3) Anti-	
		Sentimental	
		Comedy	
Drama	"Way of the World".	1) Comedy of	15
	William Congreve.	Manners	
		Satire and	
		Social Critique	
		3) Intricate Plot	
		Dialogue and	
		Wit	
		5) Themes of	
		Love and	
		Marriage	
Essay	"Great Fire".	1) Eyewitness	3
	Samuel Pepys	Report	
		Description of	
		Destruction	
		Efforts to	
		Control the	
		Fire	
		4) Historical	
		Significance	

Part: III

Paper: V

Section	Торіс	Topic of Discussion	Number of
			Classes
History	Prose	1) Novel	6
		2) Essay	
Prose	"Dream Children: A	1) Essay	4
	Reverie",	Themes of Loss and	
	Charles Lamb	Longing	
		3) Imaginary Children	
		4) Autobiographical	
		Elements	
Prose	"Chimney	1) Occupation and	4
	Sweepers".	Hardships	
	Charles Lamb	2) Fear and Challenges	
		Generosity and Loss	
		4) Unique Voices	
Prose	"Christ's Hospital	 Privileges and 	5
	Five-and-Thirty	Loneliness	
	Years Ago".	Food and Nurses	
	Charles Lamb	3) Harsh Discipline	
		4) Autobiographical	
		Insights	

Part: III

Paper: VI

Section	Торіс	Topic of Discussion	Number of Classes
History	1) Brief historical	1) Reform Acts	10
	outline	2) Women's	
	Brief socio-	Suffrage	
	cultural	3) Empire	
	history	4) Condition of	
		the Working	
		Class	
		5) Science and	
		Religion	
		6) Leisure and	
		Amusement	
Drama	"Riders to the Sea".	1) Fate and	15
	John Millington	Destiny	
	Synge.	2) Nature's	
		Power	
		Loss and Grief	
		Language and	
		Style	

Part: III

Paper: VII

Section	Торіс	Topic of Discussion	Number of Classes
History	Prose	1) Novel	5
		2) Essay	
Poetry	"Digging".	1) Theme of	2
	Seamus Heaney.	Identity	
		2) Connection to	
		Nature	
		Family and	
		Tradition	
Poetry	"Hawk Roosting".	1) Perspective	2
	Ted Hughes.	and Voice	
		2) Power and	
		Control	
		Nature and	
		Instinct	
Prose	"The Kiss".	1) Desire and	3
	Angela Carter.	Temptation	
		Identity and	
		Transformation	
		3) Power	
		Dynamics	

Semester: 1st

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-	Kalidasa.	1) History of Indian	15
1/B	"AbhijnanaShakuntalam".	Classical Drama	
		2) Rasa Theory	
		Textual Analysis	
ENGH-H-CC-T-	Plautus.	1) 1)Folklore and	15
2/A	"Pot of Gold".	mythology	
		Introduction to the	
		Author and his Age	
		Textual Analysis	

Part: III

Paper: V

Sections	Торіс	Topic	s of	Number of Classes
		Discu	ssion	
History	Poetry	1)	Lyric	6
		2)	Narrative	
Poetry	"Ode to A	1)	Transience and	3
	Nightingale".		Immortality	
	John Keats.	2)	Nature and Art	
		3)	Morality and	
			death	
		4)	Escape and	
			reality	
Poetry	"Eve of St Agnes".	1)	Fantasy and	5
	John Keats		reality	
		2)	Ritual and	
		3)	Superstition	
		4)	Escape and	
			transformation	
Poetry	"Excerpt from Don	1)	Satire and	3
	Juan" Stanzas 22-29;		humour	
	11.169 232.	2)	Picaresque	
	George Gordon		structure	
	Byron.	3)	Heroic couplet	
			and ottavarima	
		4)	Social Critique	

Part: III

Paper: VI

Sections	Торіс	Topic	s of Discussion	Number of
				Classes
History	Prose	1)	Novel	4
		2)	Essay	
Poetry	"Ulysses".	1)	Dramatic	3
	Tenyson		Monologue	
		2)	Victorian spirit	
		3)	Spirit of Heroism	
			and Leadership	
		4)	Yearning for	
			Immortality and	
			Legacy:	
Poetry	"My Last Duchess".	1)	Dramatic	3
	Robert Browning.		Monologue	
		2)	Character of the	
			Duke	
		3)	Themes of Power	
			and Control	
		4)	Art and	
			Aesthetics	
Poetry	"God's Grandeur".	1)	Sonnet	2
	Gerard Manley	2)	Celebration of	
	Hopkins.		God's Presence	
		3)	The Glory of	
			Creation	
		4)	Renewal and	
			Redemption	
		5)	Innovative	
			Language and	
			Form	
		6)	Environmental	
			and Spiritual	
			Themes	
Drama	"Arms and the Man"	1)	Satirical	20
	George Bernard		Exploration of	
	Shaw.		War and	
			Romance	

2) Class and Social
Commentary
3) Themes of
Identity and
Honor
4) Humor and
Language

Part: III

Paper: VII

Sections	Торіс	Topics of	Number of Classes
		Discussion	
History	1) Brief Historical	1) First World War	5
	Outline	2) Second World	
	2) Brief socio-	War	
	cultural		
	history		
Poetry	"Second Coming".	1) Apocalyptic	3
	W. B. Yeats.	Imagery	
		2) Historical	
		Context	
		3) Cycle of History	
		Spiritual and	
		Mystical	
		Themes	
		5) Language and	
		Structure	
Poetry	"Hollow Men".	1) Epigraph and	3
	T. S. Eliot	Opening Lines	
		2) Fragmented	
		Structure:	
		Allusions and	
		References	
		4) Theme of	
		Spiritual	
		Emptiness	
		5) Ambiguity and	
		Interpretation	
Poetry	"Bagpipe Music".	1) Whimsical and	2
	Louis Macneice.	satirical piece	
		2) Contrast	
		between	
		Tradition and	
		Modernity	
		3) Themes of	
		Identity and	

	Cultural	
	Stereotypes	

Semester: 1st

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-1/B	Kalidasa.	1) History of Indian	15
	"AbhijnanaShakuntalam".	Classical Drama	
		2) Rasa Theory	
		3) Textual Analysis	
ENGH-H-CC-T-2/A	Ovid.	1) Theme of	20
	Selections from	transformation	
	"Metamorphoses".	2) Mythological	
		stories	
		3) Human emotion	
		and relations	
		4) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/B	Sudraka. " Mricchkatika".	 Brief Introduction of classical Sanskrit Drama Brief	10
ENGH-H-CC-T-2/A	Horace. "Epistle I".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Homer. "The Iliad".	 Epic: Introduction. Concept of honor of the major Heroism and the main characters 	10
Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/ A	Shashi Deshpande. "The Intrusion".	 Introduction to the Author Textual Analysis Feminist Perspective 	7
ENGH-H-CC-T-3/A	Kamala Das. "Introduction".	 Introduction to the Text Confessional poetry Feminist Perspective 	3
ENGH-H-CC-T-3/B	Anita Desai. "In Custody".	 Cultural conflict Personal transformation Relationships dynamic 	10
ENGH-H-CC-T-4/A	Johne Donne. " The Sunne Rising "and "Valediction Forbidding".	 Brief Introduction to Metaphysical poet Characteristics of Metaphysical poem Textual Interpretation 	7

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Martin Luther King.	1) Equality and	3
	"I Have a Dream"	brotherhood	
		Introduction to	
		the Text	
ENGH-H-CC-T-5/B	Toni Morrison.	1) History of	3
	"Beloved".	Slavery	
		2) Textual Analysis	
ENGH-H-CC-T-6/B	Agatha Christie.	1) Narrative	5
	"The Murder of	Innovation	
	Roger Ackroyd".	2) Psychological	
		depth	
		3) Complex	
		character	
		4) Textual Analysis	
ENGH-H-CC-T-7/A	John Milton.	1) The	10
	"Paradise Lost" Bk1.	characterization	
		of Satan	
		2) The nature of	
		Evil	
		3) The role of God	
		4) The Epic Hero	

Semester: 4th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-8/B	William Congreve.	1)	Introduction to the	10
	"The Way of the		Text	
	World".	2)	Comedy of Manners	
		3)	Restoration comedy	
ENGH-H-CC-T-9/A	William Blake.	1)	Introduction of the	7
	"The Lamb" <i>,</i> "The		Era	
	Chimney Sweeper",	2)	Symbolism used in	
	"The Tyger".		the poem	
		3)	Textual Analysis	
		4)	Critical Appreciation	
ENGH-H-CC-T-9/A	Robert Burns.	1)	Historical context	4
	"A Bard's Epitaph"	2)	Scottish	
	and " Scots		Nationalism	
	WhaHae".	3)	Textual Analysis	
ENGH-H-CC-T-9/A	William	1)	The poet's	5
	Wordsworth.		relationships with	
	"Tintern Abbey".		nature	
		2)	Memory and	
			reflection	
		3)	The passage of time	
ENGH-H-CC-T-10/A	Alfred Tennyson.	1)	Quest for	3
	"Ulysses".		Adventure	
		2)	Spirit of heroism	
		3)	Yearning for Glory	
ENGH-H-CC-T-10/A	Robert Browning.	1)	Introduction to	3
	"My Last Duchess".		dramatic	
			Monologue	
		2)	Characterization	
		3)	Theme of Power	
			and control	

Semester: 5th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-11/A	Maya Angelou.	1)	Introduction	3
	"Caged Bird"	2)	Autobiographical work	
		3)	Metaphorical imagery	
ENGH-H-CC-T-11/A	Mahashweta Devi.	1)	Epic	4
	"Draupadi".	2)	Mahabharata	
		3)	Caste	
		4)	Gender	
		5)	Power	
ENGH-H-CC-T-12/A	William Butler	1)	Background history of	5
	Yeats. "Byzantium",		Ireland	
	"Sailing to	2)	Cultural context	
	Byzantium".	3)	Christian Civilization	
ENGH-H-CC-T-12/B	James Joyce.	1)	Coming of Age	7
	"A Potrait of the	2)	Stream of	
	Artist as a Young		consciousness	
	Man".	3)	Textual Analysis	
ENGH-H-DSE-T-2/A	Ted Hughes.	1)	Perspective of the	6
	" Hawk Roosting "		Hawk	
	and " Crow's Fall".	2)	Natural instinct	
		3)	Control and Mastery	
		4)	Nature and Natural	
			order	
ENGH-H-DSE-T-3/A	Virginia Woolf.		1) Modernism	4
	"Modern Fiction".		Virginia Woolf's	
			charges against	
			the materialists	
			3) Fiction according	
			to Woolf	
			4) The Spiritualists	
ENGH-H-DSE-T-3/A	T. S. Eliot:	1) The	idea of Tradition	4
/	"Tradition and the) 2) Hist	orical Sense	
	Individual Talent".	, 3) The	ory of Impersonality	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/B	Sudraka. "Mricchkatika".	 Brief Introduction of classical Sanskrit Drama Brief	10
ENGH-H-CC-T-2/A	Horace. "Epistle I".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Homer. "The Iliad".	 Epic: Introduction. Concept of honor of the major Heroism and the main characters 	10

Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/A	Shashi Deshpande.	1) Introduction to	7
	"The Intrusion".	the Author	
		2) Textual Analysis	
		3) Feminist	
		Perspective	
ENGH-H-CC-T-3/A	Kamala Das.	1) Introduction to	3
	"Introduction".	the Text	
		2) Confessional	
		poetry	
		3) Feminist	
		Perspective	
ENGH-H-CC-T-3/A	Jayanta Mahapatra.	1) Introduction to	3
	"Dawn at Puri".	the Author	
		2) Textual Analysis	
ENGH-H-CC-T-4/A	Johne Donne.	1) Brief Introduction	7
	"The Sunne Rising	to Metaphysical	
	"and "Valediction	poet	
	Forbidding".	2) Characteristics of	
		Metaphysical	
		poem	
		3) Textual	
		Interpretation	

Semester: 3rd

Course	Торіс	Topics of discussion		Number of
code/ Unit				classes
ENGH-H-CC-	Walt Whitman.	1)	Spirituality and Transcendence	3
T-5/A	"Passage to India".	2)	Philosophical Reflection	
ENGH-H-CC-	Allen Ginsberg.	1)	Spirituality	5
T-5/A	"An Eastern Ballad".	2)	Self discovery	
ENGH-H-CC-	Agatha Christie.	1)	Narrative Innovation	5
T-6/B	"The Murder of	2)	Psychological depth	
	Roger Ackroyd".	3)	Complex character	
		4)	Textual Analysis	
ENGH-H-CC-	Alexander Pope.	1)	Mock Heroic Epic	7
T-7/A	"The Rape of the	2)	Textual Analysis	
	Lock".			

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/A	Thomas Gray.	1) Introduction to	5
	"Elegy Written in a	Elegy	
	Country Churchyard".	2) Romantic	
		elements	
		Neo classical	
		elements	
ENGH-H-CC-T-9	Percy Bysshe Shelley.	1) Romanticism	3
	"Ode to the West	2) Introduction to	
	Wind".	Ode	
		3) Power of Nature	
		Prophetic Vision	
ENGH-H-CC-T-9/A	Samuel Taylor	1) Introduction	5
	Coleridge.	2) Imagination and	
	"khubla Khan",	creative process	
	"Dejection: An Ode".	3) The limitation of	
		human memory	
ENGH-H-CC-T-10/B	Thomas Hardy.	1) Concept of Fate	5
	"Tess of the	Social injustice	
	d'Urbervilles".	3) The struggle of	
		the working	
		class	

Semester: 5th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-11/A	Maya Angelou.	1)	Introduction	3
	"Caged Bird".	2)	Autobiographical	
		2)	Work	
		5)	imagery	
ENGH-H-CC-T-11/A	Mahashweta Devi	1)	Fnic	Δ
	"Draupadi".	2)	Mahabharata	т Т
		3)	Caste	
		4)	Gender	
		5)	Power	
ENGH-H-CC-T-12/A	William Butler Yeats.	1)	Background history	5
	"Byzantium",		of Ireland	
	"Sailing to	2)	Cultural context	
	Byzantium".	3)	Christian Civilization	
ENGH-H-CC-T-12/B	James Joyce.	1)	Coming of Age	7
	"A Portrait of the	2)	Stream of	
	Artist as a Young		consciousness	
	Man".	3)	Textual Analysis	<u> </u>
ENGH-H-DSE-T-2/A	Ted Hughes.	1)	Perspective of the	6
	Hawk Roosting	2)	Hawk Natural instinct	
	and Crowsfall.	2)	Control and Mastery	
		3) (1)	Nature and Natural	
		, – , 	order	
ENGH-H-DSE-T-3/A	Virginia Woolf.	1)	Modernism	4
	"Modern Fiction".	2)	Virginia Woolf's	
			charges against the	
			materialists	
		3)	Fiction according to	
			Woolf	
		4)	The Spiritualists	
ENGH-H-DSE-T-3/A	I.S.Ellot:	1)	The idea of Tradition	4
	i radition and the	2)	Historical Sense	
	individual l'alent".	3)	Ineory of	
			impersonality	

Semester: 6th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-13/A	Anton Chekov. "The Seagull".	 Subtext and Psychological depth Art and Creativity Textual Analysis 	10
ENGH-H-CC-T-13/B	Bertrolt Brecht.	1) Epic theatre	10
	"The Good Person of Szechwan".	 Dual Identity Redemption and Sacrifice 	
ENGH-H-CC-T-14/A	David Malouf.	1) Introduction	3
	"Revolving Days", "Wild lemons".	 Australian history Textual Analysis 	
ENGH-H-CC-T-14/A	Mamang Dai.	1) Cultural	4
	"Small Towns and the	exploration	
	River", "The Voice of the	2) Sense of place	
	Mountain".	 Bythology and folklore 	
ENGH-H-DSE-T-4/B	Poststructuralism: a. Jacques Derrida. "Structure, Sign and Play in the Discourse of the Human Science".	 Background study of Poststructuralis m Structure 	7
		3) The Centre	
		4) Sign 5) Bricolage	
	Poststructuralism: h	6) The Bricoleur	5
ENGH-H-D3E-1-4/B	Michel Foucault. "Truth and Power".	Michel Foucault	5
		2) Truth	
		3) Power	
ENGH-H-DSE-T-5/A	Sa'adat Hasan Manto. "Toba Tek Singh".	 Partition Insanity and Absurdity 	5
		3) Textual	

			Analysis	
ENGH-H-DSE-T-5/A	Lalithambika	1)	Historical	5
	Antharajanam.		context	
	"A Leaf in the Storm".	2)	Feminist	
			Perspective	
		3)	Cultural and	
			Religious	
			context	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	IlangoAdigal. "The Book of Banci".	 Introduction to Epic and Tamil Epic Themes of the poem Feministic perspective 	15
ENGH-H-CC-T-1/B	Sudraka. "Mricchkatika".	 Brief Introduction of classical Sanskrit Drama Brief	10
ENGH-H-CC-T-2/A	Horace. "Epistle I".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Homer. "The Iliad".	 Epic: Introduction Concept of honor of the major Heroism and the main characters 	10

Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/ A	Amitav Ghosh.	1) Historical context	15
	"The Ghosts of Mrs.	2) Environmental	
	Gandhi".	concerns	
		3) Global Challenges	
		4) Civil Disobedience	
		5) Critique and	
		Reflection	
ENGH-H-CC-T-3/B	Girish Karnad.	1) Introduction to the	10
	"Hayavadana".	Text	
		2) Mythology,	
		folklore	
		3) Theme of. Identity,	
		desire	
ENGH-H-CC-T-3/B	Anita Desai.	1) Cultural conflict	10
	"In Custody".	2) Personal	
		transformation	
		3) Relationships	
		dynamic	
ENGH-H-CC-T-4/A	Geoffrey Chaucer.	1) Introduction to the	7
	"Wife of Bath".	Text	
		2) Textual Analysis	
		3) Feminist	
		Perspective	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Martin Luther King. "I Have a Dream".	 Equality and brotherhood 	3
		 Introduction to the Text 	
ENGH-H-CC-T-5/B	Toni Morrison. "Beloved".	1) History of Slavery	3
		Textual Analysis	
ENGH-H-CC-T-6/B	Agatha Christie.	1) Narrative	5
	"The Murder of	Innovation	
	Roger Ackroyd".	2) Psychological	
		3) Complex character	
		4) Textual Analysis	
ENGH-H-CC-T-7/A	John Milton.	1) The	10
	"Paradise Lost". Bk1.	characterization	
		of Satan	
		2) The nature of	
		Evil	
		3) The role of God	
		4) The Epic Hero	

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/B	Jonathan Swift.	1) Satirical	7
	"Gulliver's Travels".	Comedy	
		2) Moral aspects	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-9/A	William Blake.	1) Introduction of	7
	"The Lamb", "The	the Era	
	Chimney Sweeper",	2) Symbolism	
	"The Tyger".	used in the	
		poem	
		3) Textual Analysis	
		4) Critical	
		Appreciation	
ENGH-H-CC-T-9/A	Robert Burns.	1) Historical	4
	"A Bard's Epitaph"	context	
	and "Scots WhaHae".	2) Scottish	
		Nationalism	
		3) Textual Analysis	
ENGH-H-CC-T-9/A	William Wordsworth.	 The poet's 	5
	"Tintern Abbey".	relationships	
		with nature	
		2) Memory and	
		reflection	
		The passage of	
		time	
ENGH-H-CC-T-10/A	Christina Rossetti.	1) Introduction of	4
	"The Goblin Market".	the Age	
		2) Victorian	
		Morality	
		3) Themes of	
		Temptations	
		and desire	
ENGH-H-CC-T-10/B	Charlotte Bronte.	1) Discussion on	4
	"Jane Eyre".	Jane Eyre	
		2) Feminist	
		Perspective	
		3) Textual Analysis	

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of classes
Unit			
ENGH-H-CC-T-11/A	Sylvia Plath. "Daddy", " Lady Lazarus ".	 Confessional poetry Discussion on Sylvia Plath's life and her works 	5
ENGH-H-CC-T-11/A	Katherine Mansfield. "Bliss".	 Upper society in England Feminist Perspective Homosexuality 	3
ENGH-H-CC-T-12/A	Wystan Hugh Auden. "Unknown Citizen".	 Conformist society Good citizen Textual Analysis 	3
ENGH-H-CC-T-12/B	Joseph Conrad. "Heart of Darkness".	 Novella Imperialism Human darkness 	4
ENGH-H-DSE-T-2/B	George Orwell. "Animal Farm".	 Allegory Political Allegory Russian Revolution 	5
ENGH-H-DSE-T-3/A	Virginia Woolf. "Modern Fiction".	 Modernism Virginia Woolf's charges against the materialists Fiction according to Woolf The Spiritualists 	4
ENGH-H-DSE-T-3/A	T. S. Eliot: "Tradition and the Individual Talent".	 The idea of Tradition Historical Sense Theory of Impersonality 	4

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Anton Chekov. "The Seagull".	 Subtext and Psychological depth Art and Creativity Textual Analysis 	10
ENGH-H-CC-T-13/B	Bertrolt Brecht. "The Good Person of Szechwan".	 Epic theatre Dual Identity Redemption and Sacrifice 	10
ENGH-H-CC-T-14/B	Chinua Achebe. "Things Fall Apart".	 Exploration of colonialism, Cultural identity, and the complexities of human experience. Textual Analysis 	5
ENGH-H-DSE-T-4/B	Poststructuralism: a. Jacques Derrida. "Structure, Sign and Play in the Discourse of the Human Science".	 Background study of Poststructuralis m Structure The Centre Sign Bricolage The Bricoleur 	7
ENGH-H-DSE-T-4/B	Poststructuralism: b. Michel Foucault. "Truth and Power".	 Discussion on Michel Foucault Truth Power 	5
ENGH-H-DSE-T-5/A	DibyenduPalit, "Alam's Own House".	 Introduction Family dynamics Cultural context 	4
ENGH-H-DSE-T-5/A	Manik Bandyopadhyay.	 1) Introduction 2) Quest for 	7

"The Final Solution".	Identity	
	3) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	llangoAdigal.	1) Introduction to	15
	"The Book of Banci".	Epic and Tamil	
		Epic	
		2) Themes of the	
		poem	
		3) Feministic	
		perspective	
ENGH-H-CC-T-2/A	Horace.	1) Introduction	10
	"Epistle I".	2) Textual Analysis	
ENGH-H-CC-T-2/B	Homer.	1) Epic:	10
	"The Iliad".	Introduction	
		2) Concept of	
		honor	
		3) Heroism and	
		the main	
		characters	

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/ A	Salman Rushdie.	1) Symbolism of	7
	"The Free Radio".	Free Radio	
		2) Satirical	
		commentary	
		Cultural context	
ENGH-H-CC-T-3/A	Nissim Ezekiel.	 India writing in 	3
	"Enterprise".	English	
		2) Title of the	
		poem	
		Textual Analysis	
ENGH-H-CC-T-3/B	Anita Desai.	1) Cultural conflict	10
	"In Custody".	2) Personal	
		transformation	
		3) Relationships	
		dynamic	
ENGH-H-CC-T-4/A	Fransis Bacon.	1) Short	5
	"Of Empire".	Introduction on	
		Essay	
		2) Textual Analysis	

Semester: 3rd

Course	Торіс	Topics of discussion	Number of
code/ Unit			classes
ENGH-H-CC-	Walt Whitman.	1) Spirituality and Transcendence	3
T-5/A	"Passage to India".	2) Philosophical Reflection	
ENGH-H-CC-	Allen Ginsberg.	1) Spirituality	5
T-5/A	"An Eastern	2) Self discovery	
	Ballad".		
ENGH-H-CC-	Agatha Christie.	1) Narrative Innovation	5
Т-6/В	"The Murder of	2) Psychological depth	
	Roger Ackroyd".	3) Complex character	
		Textual Analysis	
ENGH-H-CC-	Alexander Pope.	1) Mock Heroic Epic	7
T-7/A	"The Rape of the	2) Textual Analysis	
	Lock".		

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/B	William Congreve. "The Way of the World".	 Introduction to the Text Comedy of Manners Restoration 	10
		comedy	
ENGH-H-CC-T-9	Percy Bysshe Shelley. "Ode to the West Wind".	 Introduction to Ode The power of 	3
		Nature 3) Prophetic Vision	
ENGH-H-CC-T-9/A	Samuel Taylor Coleridge. "Kubla Khan", "Dejection: An Ode".	 Introduction Imagination and creative process The limitation of human memory 	5
ENGH-H-CC-T-10/B	Thomas Hardy. "Tess of the d'Urbervilles".	 Concept of Fate Social injustice The struggle of the working class 	5

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-11/A	Rassundari Debi. "Amar Jiban".	 Bengali literature Feminist Perspective Textual Analysis 	5
ENGH-H-CC-T-11/B	Alice Walker. "The Color Purple".	 Introduction Feminist Perspective Homosexuality 	6
ENGH-H-CC-T-12/A	Wystan Hugh Auden. "Unknown Citizen".	 Conformist society Good citizen Textual Analysis 	3
ENGH-H-CC-T-12/B	Joseph Conrad. "Heart of Darkness".	 Novella Imperialism Human darkness 	4
ENGH-H-DSE-T-2/B	George Orwell. "Animal Farm".	 Allegory Political Allegory Russian Revolution 	5
ENGH-H-DSE-T-3/A	Virginia Woolf. "Modern Fiction".	 Modernism Virginia Woolf's charges against the materialists Fiction according to Woolf The Spiritualists 	4
ENGH-H-DSE-T-3/A	T. S. Eliot: "Tradition and the Individual Talent".	 The idea of Tradition Historical Sense Theory of Impersonality 	4

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Samuel Beckett.	1) Existential	10
	"Waiting for Godot".	themes	
		2) Absurdity	
		Textual Analysis	
ENGH-H-CC-T-14/A	David Malouf.	1) Introduction	3
	"Revolving Days",	2) Australian	
	"Wild lemons".	history	
		Textual Analysis	
ENGH-H-CC-T-14/A	Mamang Dai.	1) Cultural	4
	"Small Towns and the	exploration	
	River", "The Voice of	2) Sense of place	
	the Mountain".	Mythology and	
		folklore	
ENGH-H-DSE-T-4/B	Poststructuralism: a.	1) Background	7
	Jacques Derrida.	study of	
	"Structure, Sign and	Poststructuralis	
	Play in the Discourse	m	
	of the Human	2) Structure	
	Science".	3) The Centre	
		4) Sign	
		5) Bricolage	
		6) The Bricoleur	
	Doctetructuralisme	1) Discussion on	F
	POSISITUCIUI alisiti. P. Michal Foucault	I) Discussion on Michal Foucault	5
	"Truth and Dowor"	2) Truth	
	Thut and Power.	2) Introv	
	Dibyondu Polit	1) Introduction	Δ
	"Alam's Own House"	2) Eamily	4
	Aldin's Own nouse.	2) raininy dynamics	
		3) Cultural contaxt	
ENGH_H_DSE_T_5/A	Manik	1) Introduction	7
	Bandyonadhyay	2) Ouest for	/
	"The Final Solution"	Identity	
		3) Textual Analysis	

Department of English

Lesson Plan

Name of the Teacher: Masadul Islam

Year: 2018

Part: II

Paper: III

Section	Торіс	Topics of Discussion	Number of
			Classes
History	Brief Socio-cultural history and history of ideas	 Humanism, Homocentric Worldview, Renaissance Reformation, Growth of Puritanism Place of Women 	3
Drama	"Shoemaker's Holiday". Thomas Dekker.	 Disguise and Identity Social Mobility and Class Love and Marriage Symbolism and Motifs 	15
Poetry	"The Good-Morrow". John Donne.	 Metaphysical poem Love and Unity Awakening and Enlightenment Reality and Perception Sonnet-Like Structure 	2
Poetry	"Lycidas". John Milton.	 Pastoral Elegy Elegy for Edward 	5

King 3) Verse and
(A) Death and Loss
5) Mythological
References

Part: II

Paper: IV

Section	Торіс	Topics of Discussion	Number of Classes
History	Poetry	 Mock epic Metaphysical poetry Pre-Romantics 	5
Poetry	"Elegy Written in a Country Churchyard". Thomas Gray.	 Elegy Reflective and melancholic poem that contemplates death, mortality, and the lives of ordinary people. Churchyard Setting Legacy and Remembrance 	3
Essay	"Some Reflections Upon Marriage". Mary Astell.	 Feminist thought that critiques the institution of marriage and its impact on women's lives. Critique of Marriage, Marriage as a Social Contract Education and Intellectual Equality Advocacy for Reform 	3

Part: III

Paper: V

Section	Торіс	Topics of Discussion	Number of
			Classes
History	 Brief historical outline Brief Socio- cultural history 	 French Revolution Napoleanic wars Cult of Imagination in other arts 	6
Poetry	"This Lime-Tree Bower My Prsion". S.T. Coleridge.	 Imagination and Nature Reconciliation with Confinement Isolation and Reflection Contentment and Reconciliation Lyrical Ode Blank Verse 	3
Poetry	"Kubla Khan". S.T. Coleridge	 Fragmentary Nature Romantic Ideals Allusion and Myth Mysterious and Enigmatic 	2
Poetry	"Ode to the West Wind". P.B. Shelley.	 Ode West Wind: Represents natural power and transformation. Autumn and Winter: Symbolize decay and renewal 	3

Part: III

Paper: VI

Section	Торіс	Topics of	Number of Classes
		Discussion	
History	Drama	1) Comedy	2
		2) Tragedy	
		3) Tragic-	
		comedy	
Poetry	"In the Bleak	1) Nativity	2
	Midwinter".	2) Humanity and	
	Christina Rossetti.	Humility	
		3) Personal	
		Devotion	
Prose	"Lilies of Queen's	1) Art and Nature	3
	Garden".	Moral and	
	John Ruskin.	Aesthetic	
		Value	
		3) Critique of	
		Industrializatio	
		n	
		4) Symbolism of	
		lilles	

Part: III

Paper: VII

Section	Торіс	Topic	s of Discussion	Number of Classes
History	Poetry	1)	Lyric	2
		2)	The Epic	
		3)	The Ode	
		4)	The Sonnet	
Poetry	"Musee des Beaux	1)	Indifference to	2
	Arts".		Suffering	
	W.H. Auden.	2)	Art and Reality	
		3)	Historical and	
			Mythological	
			Contexts	
Poetry	"Fern Hill".	1)	Nostalgia and	2
	Dylan Thomas.		Innocence	
		2)	Themes of	
			Time and	
			Transience	
		3)	Mythical	
			Quality	
Poetry	"The Whitsun	1)	Observation of	3
	Weddings".		Ordinary Life	
	Philip Larkin.	2)	Contrast	
			Between Public	
			and Private	
			Lives	
		3)	Themes of	
			Social	
			Conformity	
Novel	"England England".	1)	Satire and	20
	Julian Barnes.		Parody	
		2)	The Concept of	
			England,	
			England	
		3)	Themes of	
			Authenticity	
			and Artificiality	
		4)	Critique of	
			Modern Society	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Ilango Adigal.	1) Introduction to	15
	"The Book of Banci".	Epic and Tamil	
		Epic	
		Themes of the	
		poem	
		3) Feministic	
		perspective	
ENGH-H-CC-T-2/A	Ovid.	1) Theme of	20
	Selections from	transformation	
	"Metamorphoses".	2) Mythological	
		stories	
		Human emotion	
		and relations	
		Textual Analysis	

Part: III

Paper: V

Section	Topic	Topic of Discussion	Number of Classes
Poetrv	"The Lamb" and "The	1) British	4
	Tyger".	Romantic	
	William Blake.	poetry	
		2) Songs of	
		Innocence and	
		Songs of	
		Experience	
		3) Duality and	
		Contrast	
		4) Exploration of	
		the Divine	
		5) The Role of	
		Imagination	
Poetry	"After Blenheim"	1) The Cost of	2
	Robert Southey.	War on	
		Ordinary	
		People	
		2) Irony and	
		Disillusionment	
		3) The Futility of	
		War	
		4) The Loss of	
		Innocence	
		5) Propaganda	
		and	
		Manipulation	
Poetry	"Recollections of	1) Loss of	5
	Early Child hood"	Innocence and	
	William Wordsworth.	the Power of	
		Childhood	
		Perception	
		2) Nature as a	
		Source of	
		Spiritual	
		Connection	
		 Memory and 	

		the Power of Imagination
Novel	"Frankenstein" Mary Shelley.	 Gothic Fiction The Dangers of Science and Ambition Nature vs. Nurture Prejudice and Social Rejection Fate vs. Free
		Will

Part: III

Paper: VI

Section	Торіс	Topic of Discussion	Number of Classes
Poetry	"The Picture Gallery	1) The Power of	2
	at Penhurst".	Family Legacy	
	Elizabeth Barrett	2) The Interplay	
	Browning.	of Past and	
		Present	
		3) The Search for	
		Identity	
		Mortality and	
		the	
		Inevitability of	
		Change	
		5) The Power of	
		Art and	
		Memory	
Poetry	"Self-interrogation"	1) Self-Scrutiny	2
	Emily Bronte.	and Existential	
		Doubt	
		2) The Passage of	
		Time and	
		Mortality	
		3) The Search for	
		Personal	
		Fulfillment	
		4) The Power of	
		Choice and	
		Free Will	
Poetry	"To Marguerite".	1) Isolation and	2
	Matthew Arnold.	Longing	
		2) The Power of	
		Memory	
		3) The Passage of	
		Time	
		4) The Elusive	
		Nature of Love	
Prose	"Subjection of	1) Gender	3
	Women". [Extract	Inequality as	

	from Chapter II.]		Injustice	
	John Stuart Mill.	2)	Equality of	
			Rights and	
			Opportunities	
		3)	The	
			Artificiality of	
			Gender Roles	
		4)	Women's	
			Potential and	
			Autonomy	
		5)	The Harm of	
			Legal	
			Subordination	
Prose	"Letter from	1)	Colonial	3
	Barrackpore."		Observation	
	Extract from Letters		and	
	from India.		Perception	
	Emily Eden.	2)	The	
			Disconnect	
			Between	
			Colonizer and	
			Colonized	
		3)	Social	
			Commentary	
			and Satire	
		4)	The Allure and	
			Mystery of	
			India	

Part: III

Paper: VII

Section	Торіс	Topic of Discussion	Number of Classes
Prose	"Two Cheers for	1) Critique of	3
	Democracy".	Totalitarianism	
	E. M. Forster.	2) The Value of	
		Individualism	
		The Limits of	
		Democracy	
		4) The	
		Importance of	
		Culture and	
		Art	
Prose	"The Mark on the	1) Modernist	3
	Wall".	Fiction	
	Virginia Woolf.	Nature and	
		Civilization	
		3) War	
		Self and the	
		Other	
		5) Time and	
		Memory	
Prose	"Araby".	1) Coming of Age	3
	James Joyce.	2) Religion and	
		Catholicism	
		3) Escapism and	
		the Exotic	
Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/B	"The Book of the Assembly Hall", "The Temptation of Karna".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/A	Horace. "Epistle I".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Homer. "The Iliad".	 Epic: Introduction. Concept of honour of the major Heroism and the main characters 	10

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Vyasa. "The Dicing" and "The sequel to Dicing".	 Historical and Cultural Background of Indian society Textual Analysis Critical Appreciation 	15
ENGH-H-CC-T-1/B	"The Book of the Assembly Hall" "The Temptation of Karna".	3) Introduction4) Textual Analysis	10
ENGH-H-CC-T-2/B	Sophocles. "Oedipus the king"	 History of Classical Greece Aristotle & Greek Tragedy The Text Translation & 'The Unities Critical Aspects 	15

Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/ A	Amitav Ghosh.	1) Historical context	15
	"The Ghosts of Mrs	2) Environmental	
	Gandhi".	concerns	
		3) Global Challenges	
		4) Civil Disobedience	
		5) Critique and	
		Reflection	
ENGH-H-CC-T-3/A	Arun kolatkar.	1) Introduction to	3
	"The Bus".	the Text	
		2) Textual Analysis	
ENGH-H-CC-T-3/B	Girish Karnad.	1) Introduction to	10
	"Hayavadana".	the Text	
		2) Mythology,	
		folklore	
		3) Theme of.	
		Identity, desire	
ENGH-H-CC-T-4/A	Geoffrey Chaucer.	1) Introduction to	7
	"Wife of Bath".	the Text	
		2) Textual Analysis	
		3) Feminist	
		Perspective	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Anne Bradstreet.	1) Introduction to	3
	"The prologue".	the Text	
		2) Textual Analysis	
ENGH-H-CC-T-5/A	Abraham Lincoln.	1) Slavery system	3
	"Gettysburg	in America	
	Address".	Introduction to	
		the Text	
ENGH-H-CC-T-6/A	Shyam Selvadurai.	1) Coming of Age	7
	"Funny Boy".	and Identity	
		2) Ethnic Conflict	
		3) Loss of	
		Innocence	

Semester: 4th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-8/A	Samuel Johnson.	1) Introduction	4
	"London".	2) Samuel Johnson's	
		writing and his	
		contribution	
		Textual Analysis	
		4) Critical Analysis	
ENGH-H-CC-T-8/A	Eliza Heywood.	 Introduction to the 	7
	"Fantomina".	Text	
		2) Feminist Approach	
		3) Critical Analysis	
ENGH-H-CC-T-9	Percy Bysshe Shelley.	1) Romanticism	3
	"Ode to the West	Introduction to Ode	
	Wind".	Power of Nature	
		4) Prophetic Vision	
ENGH-H-CC-T-9/A	Samuel Taylor	1) Introduction	5
	Coleridge.	2) Imagination and	
	"khubla Khan",	creative process	
	"Dejection: An Ode".	3) The limitation of	
		human memory	
ENGH-H-CC-T-10/B	Charles Dickens.	1) Victorian aspects	5
	"Hard Times".	2) Characterization	
		Critical Analysis	

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-11/A	Rassundari Debi. "Amar Jiban"	 Bengali literature Fominist 	5
		2) Ferminist Porsportivo	
		3) Textual Analysis	
ENGH-H-CC-T-11/B	Alice Walker	1) Introduction	6
	"The Color Purple"	2) Feminist	0
		Perspective	
		3) Homosexuality	
ENGH-H-CC-T-12/A	Thomas Stearns	1) Alienation	6
	Eliot.	2) Urban Decay	
	"The Love Song of J.	3) Struggle for Self –	
	Alfred Prufrock",	Expression	
	"Preludes", "Hollow		
	Men".		
ENGH-H-CC-T-12/B	John Millington	1) Irish literary revival	4
	Synge.	2) Textual Analysis	
	"Riders to the Sea".	Critical Analysis	
ENGH-H-DSE-T-2/A	Phillip Larkin.	1) Modernism	7
	"Whitsun Weddings"	2) Cultural context	
	and "Church Going".	Textual Analysis	
ENGH-H-DSE-T-2/B	John Osborne.	1) Post-Modern Era	6
	"Look back in	2) Kitchen sink drama	
	Anger".	Class difference	
ENGH-H-DSE-T-3/B	Cleanth Brooks.	1) Cleanth Brooks	5
	"The Heresy of	2) Introduction	
	Paraphrase".	3) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Vyasa. "The Dicing"and "The	1) Historical and Cultural	15
	sequel to Dicing".	Background of Indian society	
		2) Textual Analysis	
		 Critical Appreciation 	
ENGH-H-CC-T-1/B	"The Book of the	1) Introduction	10
	Assembly Hall"	2) Textual Analysis	
	"The Temptation of Karna".		
ENGH-H-CC-T-2/B	Sophocles.	1) History of	15
	"Oedipus the king".	Classical Greece	
		2) Aristotle &	
		Greek Traged	
		3) The Text	
		4) Translation &	
		'The Unities	
		5) Critical Aspects	

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/A	Toru Dutt.	1) Themes and	3
	"Our Casuarina Tree".	context of	
		Indian English	
		literature	
		2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-3/A	Arun kolatkar.	1) Introduction to	3
	"The Bus".	the Text	
		2) Textual Analysis	
ENGH-H-CC-T-4/A	Edmund Spencer.	1) Introduction to	3
	"One day I wrote her	Spenserian	
	name".	sonnet	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topic	s of discussion	Number of classes
ENGH-H-CC-T-5/A	Edgar Allan Poe.	1)	Background	5
	"The Purloined		history of	
	Letter".		American	
			literature	
		2)	Introduction to	
			the Text	
		3)	Textual Analysis	
ENGH-H-CC-T-5/A	Anne Bradstreet.	1)	Introduction to	3
	"The prologue"		the Text	
		2)	Textual Analysis	
ENGH-H-CC-T-5/B	Tennessee Williams.	1)	Gender roles	10
	"The Glass	2)	Escapism	
	Menegerie".	3)	familial	
			responsibility	
		4)	and unfulfilled	
			desire.	
ENGH-H-CC-T-6/A	Durgabai Vyam and	1)	Caste	5
	Subhash Vyam.		Discrimination	
	"Bhimayana".	2)	Social justice	
ENGH-H-CC-T-7/A	John Webster.	1)	Theatrical	7
	"The Duchess of		elements	
	Malfi".	2)	Morality and	
			Ethics	
		3)	Reception and	
			legacy	
ENGH-H-CC-T-7/A	Aphra Behn.	1)	Introduction	5
	"The Rover".	2)	Detail analysis	
			of the text	
ENGH-H-CC-T-5/A ENGH-H-CC-T-5/B ENGH-H-CC-T-6/A ENGH-H-CC-T-7/A	Anne Bradstreet. "The prologue" Tennessee Williams. "The Glass Menegerie". Durgabai Vyam and Subhash Vyam. "Bhimayana". John Webster. "The Duchess of Malfi". Aphra Behn. "The Rover".	2) 3) 1) 2) 1) 2) 3) 4) 1) 2) 1) 2) 3) 1) 2) 3)	the Text Textual Analysis Introduction to the Text Textual Analysis Gender roles Escapism familial responsibility and unfulfilled desire. Caste Discrimination Social justice Theatrical elements Morality and Ethics Reception and legacy Introduction Detail analysis of the text	3 10 5 7 5

Semester: 4th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-8/A	Samuel Johnson.	1) Introduction	4
	"London".	Samuel Johnson's	
		writing and his	
		contribution	
		Textual Analysis	
		4) Critical Analysis	
ENGH-H-CC-T-8/A	Eliza Heywood.	1) Introduction to the	7
	"Fantomina".	Text	
		2) Feminist Approach	
		3) Critical Analysis	
ENGH-H-CC-T-9/B	George Gordon	1) Byronic hero	5
	Byron.	Travelogue and	
	"Childe Harold's	exploration	
	Pilgrimage".	3) Theme of Alienation	
		and Exile	
ENGH-H-CC-T-9/B	Mary Shelley.	1) Gothic fiction	5
	"Frankenstein".	2) The monster and	
		human	
		3) Theme of	
		Alienation and	
		hubris	
ENGH-H-CC-T-10/B	Charles Dickens.	1) Victorian aspects	5
	"Hard Times".	2) Characterization	
		3) Critical Analysis	

Semester: 5th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-11/A	Emily Dickinson.	1) Introduction to	3
	"I cannot live with	the poem	
	you", "l'm 'wife'-l've	2) Feminist	
	finished that".	Perspective	
		Critical Analysis	
ENGH-H-CC-T-11/B	Mary Wollstonecraft.	1) Feminism	7
	" A Vindication of the	2) Waves of	
	Rights of Woman".	Feminism	
		3) Rights of	
		woman	
ENGH-H-CC-T-12/A	Dovid Herbert	1) Theme of	4
	Lawrence.	Isolation	
	"Odour of	2) Family dynamics	
	Chrysanthemums".	Complexities of	
		human	
		relationship	
ENGH-H-CC-T-12/A	Virginia Woolf.	1) Complexities of	4
	"Mark on the Wall".	Perception and	
		Consciousness	
		2) Stream of	
		consciousness	
ENGH-H-CC-T-12/A	W. Somerset	1) Themes of	5
	Maugham.	morality,	
	"Rain".	hypocrisy and	
		cultural clashes	
		2) Colonialism	
ENGH-H-DSE-T-2/A	Seamus Heaney.	1) Irish Identity	7
	"Digging" and	2) Violence and	
	"Casualty".	loss	
		3) Textual Analysis	
ENGH-H-DSE-T-2/A	Carol Anne Duffy.	1) Theme of	4
	"Text" and "Stealing".	Isolation	
		2) Existential angst	
		3) Textual Analysis	
ENGH-H-DSE-T-3/B	Cleanth Brooks.	1) Cleanth Brooks	5
	"The Heresy of	2) Introduction	
	Paraphrase".	3) Textual Analysis	

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Samuel Beckett.	1) Existential	10
	"Waiting for Godot".	themes	
		2) Absurdity	
		3) Textual Analysis	
ENGH-H-CC-T-14/A	Pablo Neruda.	1) Universality of	4
	"Tonight I Can Write	human	
	<i>", "</i> The Way Spain	experience	
	Was".	2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-14/A	Derek Walcott.	1) Colonialism	5
	"A Far Cry from Africa	Complexities of	
	", "Names".	identity	
		3) Textual Analysis	
ENGH-H-DSE-T-4/A	Marxism: a. Antonio	1) Introduction to	7
	Gramosci.	Marxism	
	"The Formation of	2) Organic	
	the Intellectuals" and	Intellectuals	
	"Hegemony (Civil	3) Traditional	
	Society) and	Intellectuals	
	Separation of	4) Role within	
	Powers".	Superstructures	
ENGH-H-DSE-T-4/B	Marxism: b. Louis	1) Ideological State	5
	Althusser.	Apparatuses(ISA	
	"Ideology and)	
	Ideological State	2) Repressive State	
	Apparatuses".	Apparatuses	
		3) Function of ISAs	
ENGH-H-DSE-T-5/A	Faiz Ahmad Faiz.	1) Political context	5
	"For Your Lanes, My	2) Resistance and	
	Country".	hope	
		3) Textual Analysis	
ENGH-H-DSE-T-5/B	Intizar Husain,	1) Themes of	5
	"Basti".	identity,	
		displacement,	
		and the	
		partition of	
		India.	

2) Textual Analysis			
		2) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/B	Kalidasa. "Abhijnana Shakuntalam".	 History of Indian Classical Drama Pasa Theory 	15
		3) Textual Analysis	
ENGH-H-CC-T-1/B	"The Book of the Assembly Hall" "The Temptation of Karna"	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Sophocles. "Oedipus the king".	 History of Classical Greece Aristotle & Greek Tragedy The Text Translation & 'The Unities Critical Aspects 	15

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/A	Toru Dutt."Our	1) Themes and	3
	Casuarina Tree".	context of	
		Indian English	
		literature	
		2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-3/A	Arun kolatkar.	1) Introduction to	3
	"The Bus".	the Text	
		2) Textual Analysis	
ENGH-H-CC-T-4/A	Edmund Spencer.	1) Introduction to	3
	"One day I wrote her	Spenserian	
	name".	sonnet	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Edgar Allan Poe.	1) Background	5
	"The Purloined	history of	
	Letter".	American	
		literature	
		2) Introduction to	
		the Text	
		Textual Analysis	
ENGH-H-CC-T-5/A	Anne Bradstreet.	1) Introduction to	3
	"The prologue".	the Text	
		Textual Analysis	
ENGH-H-CC-T-5/B	Tennessee Williams.	1) Gender roles	10
	"The Glass	2) Escapism	
	Menegerie".	3) Familial	
		responsibility	
		and unfulfilled	
		desire.	
ENGH-H-CC-T-6/A	Durgaba iVyam and	1) Caste	5
	Subhash Vyam.	Discrimination	
	"Bhimayana".	Social justice	
ENGH-H-CC-T-7/A	Alexander Pope.	1) Mock Heroic	7
	" The Rape of the	Epic	
	Lock".	Textual Analysis	

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/B	William Congreve.	1) Introduction to the	10
	"The Way of the	Text	
	World".	2) Comedy of Manners	
		3) Restoration comedy	
ENGH-H-CC-T-9/A	John Keats.	1) Concept of beauty	5
	"Ode to a	2) Escape and	
	Nightingale", "Bright	immersion	
	Star", "To Autumn"	3) Textual Analysis	
ENGH-H-CC-T-10/B	Charles Dickens.	1) Victorian aspects	5
	"Hard Times".	2) Characterization	
		3) Critical Analysis	

Semester: 5th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-11/A	Emily Dickinson.	1) Introduction to	3
	"I cannot live with	the poem	
	you", "I'm 'wife'-I've	2) Feminist	
	finished that".	Perspective	
		Critical Analysis	
ENGH-H-CC-T-11/B	Mary Wollstonecraft.	1) Feminism	7
	"A Vindication of the	2) Waves of	
	Rights of Woman".	Feminism	
		3) Rights of woman	
ENGH-H-CC-T-12/A	Dovid Herbert	1) Theme of	4
	Lawrence.	Isolation	
	"Odour of	2) Family dynamics	
	Chrysanthemums".	3) Complexities of	
		human	
		relationship	
ENGH-H-CC-T-12/A	Virginia Woolf. "	1) Complexities of	4
	Mark on the Wall"	Perception and	
		Consciousness	
		2) Stream of	
		consciousness	
ENGH-H-CC-T-12/A	W. Somerset	1) Themes of	5
	Maugham. "Rain"	morality,	
		hypocrisy and	
		cultural clashes	
		2) Colonialism	
ENGH-H-DSE-T-2/A	Seamus Heaney.	1) Irish Identity	7
	"Digging" and "	2) Violence and	
	Casualty"	loss	
		3) Textual Analysis	
ENGH-H-DSE-T-2/A	Carol Anne Duffy.	1) Theme of	4
	"Text" and "Stealing"	Isolation	
		2) Existential angst	
		3) Textual Analysis	
ENGH-H-DSE-T-3/B	Cleanth Brooks. "The	1) Cleanth Brooks	5
	Heresy of	2) Introduction	
	, Paraphrase"	3) Textual Analysis	
		, , , , ,	

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Henrik Ibsen. "Ghosts".	 Psychological realism Social hypocrisy The Ghost of the Past 	10
ENGH-H-CC-T-14/A	Pablo Neruda. "Tonight I Can Write ", "The Way Spain Was".	 Universality of human experience Textual Analysis Critical Appreciation 	4
ENGH-H-CC-T-14/A	Derek Walcott. "A Far Cry from Africa ", "Names"	 Colonialism Complexities of identity Textual Analysis 	5
ENGH-H-DSE-T-4/A	Marxism: a. Antonio Gramosci. "The Formation of the Intellectuals" and "Hegemony (Civil Society) and Separation of Powers".	 Introduction to Marxism Organic Intellectuals Traditional Intellectuals Role within Superstructures 	7
ENGH-H-DSE-T-4/B	Marxism: b. Louis Althusser. "Ideology and Ideological State Apparatuses".	 Ideological State Apparatuses (ISA) Repressive State Apparatuses Function of ISAs 	5
ENGH-H-DSE-T-5/A	Faiz Ahmad Faiz. "For Your Lanes, My Country".	 Political context Resistance and hope Textual Analysis 	5
ENGH-H-DSE-T-5/B	Amitav Ghosh. "The Shadow Lines".	 Historical facts Complexities of Border 	7

	3) Textual Analysis	
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Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/B	Kalidasa. " Abhijnana	 History of Indian Classical 	15
	Shakuntalam".	Drama	
		2) Rasa Theory	
		3) Textual Analysis	
ENGH-H-CC-T-1/B	"The Book of the	1) Introduction	10
	Assembly Hall"	2) Textual Analysis	
	"The Temptation of		
	Karna".		
ENGH-H-CC-T-2/B	Sophocles.	1) History of	15
	"Oedipus the king"	Classical Greece	
		2) Aristotle &	
		Greek Tragedy	
		3) The Text	
		4) Translation &	
		'The Unities	
		5) Critical Aspects	

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/A	Toru Dutt.	1) Themes and	3
	"Our Casauarina	context of	
	Tree".	Indian English	
		literature	
		2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-3/A	Arun kolatkar.	1) Introduction to	3
	"The Bus".	the Text	
		2) Textual Analysis	
ENGH-H-CC-T-4/A	Edmund Spencer.	1) Introduction to	3
	"One day I wrote her	Spenserian	
	name".	sonnet	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topics	s of discussion	Number of classes
ENGH-H-CC-T-5/A	Edgar Allan Poe.	1)	Background	5
	"The Purloined		history of	
	Letter".		American	
			literature	
		2)	Introduction to	
			the Text	
		3)	Textual Analysis	
ENGH-H-CC-T-5/A	Anne Bradstreet.	1)	Introduction to	3
	"The prologue".		the Text	
		2)	Textual Analysis	
ENGH-H-CC-T-5/B	Tennessee Williams.	1)	Gender roles	10
	"The Glass	2)	Escapism	
	Menegerie".	3)	Familial	
			responsibility	
			and unfulfilled	
			desire.	
ENGH-H-CC-T-6/A	Durgabai Vyam and	1)	Caste	5
	Subhash Vyam.		Discrimination	
	"Bhimayana".	2)	Social justice	
ENGH-H-CC-T-7/A	John Webster.	1)	Theatrical	7
	"The Duchess of		elements	
	Malfi".	2)	Morality and	
			Ethics	
		3)	Reception and	
			legacy	
ENGH-H-CC-T-7/A	Aphra Behn.	1)	Introduction	5
	"The Rover".	2)	Detail analysis	
			of the text	

Semester: 4th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-8/A	Samuel Johnson.	1) Introduction	4
	"London".	Samuel Johnson's	
		writing and his	
		contribution	
		Textual Analysis	
		4) Critical Analysis	
ENGH-H-CC-T-8/A	Eliza Heywood.	1) Introduction to the	7
	"Fantomina".	Text	
		2) Feminist Approach	
		3) Critical Analysis	
ENGH-H-CC-T-9/A	John Keats.	1) Concept of beauty	5
	"Ode to a	2) Escape and	
	Nightingale", "Bright	immersion	
	Star", "To Autumn".	3) Textual Analysis	
ENGH-H-CC-T-10/B	Charles Dickens.	1) Victorian aspects	5
	"Hard Times".	2) Characterization	
		3) Critical Analysis	

Semester: 5th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-11/A	Emily Dickinson.	1) Introduction to	3
	"I cannot live with	the poem	
	you", "l'm 'wife'-l've	2) Feminist	
	finished that".	Perspective	
		3) Critical Analysis	
ENGH-H-CC-T-11/B	Mary Wollstonecraft.	1) Feminism	7
	" A Vindication of the	2) Waves of	
	Rights of Woman".	Feminism	
		3) Rights of	
		woman	
ENGH-H-CC-T-12/A	William Butler Yeats.	1) Background	5
	"Byzantium", "Sailing	history of	
	to Byzantium".	Ireland	
		2) Cultural context	
		3) Christian	
		Civilization	
ENGH-H-CC-T-12/B	James Joyce.	1) Coming of Age	7
	"A potrait of the	2) Stream of	
	Artist as a Young	consciousness	
	Man".	3) Textual Analysis	
ENGH-H-DSE-T-2/A	Seamus Heaney.	1) Irish Identity	7
	"Digging" and	2) Violence and	
	"Casualty".	loss	
		3) Textual Analysis	
ENGH-H-DSE-T-2/A	Carol Anne Duffy.	1) Theme of	4
	"Text" and "Stealing".	Isolation	
		2) Existential	
		angst	
		3) Textual Analysis	
ENGH-H-DSE-T-3/B	Cleanth Brooks.	1) Cleanth Brooks	5
	"The Heresy of	2) Introduction	
	Paraphrase".	3) Textual	
		Analysis	

Semester: 6th

Course code/	Торіс	Topics of discussion	Number of classes
Unit			
ENGH-H-CC-T-13/B	Eugene Ionesco,	 Absurdity and 	10
	"Rhinoceros".	Surrealism	
		Conformity and	
		Mass Movement	
		Textual Analysis	
ENGH-H-CC-T-13/B	Luigi Pirandello.	1) Meta-theatrical	10
	"Six Characters in	2) Identity and	
	Search of an Author".	reality	
		3) Theatrical illusion	
ENGH-H-CC-T-14/A	Bessie Head. "The	1) Gender roles and	5
	Collector of	Power	
	Treasures".	2) Social Hierarchy	
		3) Cultural context	
ENGH-H-CC-T-14/A	Ama Ata Aidoo.	1) Postcolonial	5
	"The Girl Who Can".	Themes	
		2) Gender dynamics	
		3) Textual Analysis	
ENGH-H-CC-T-14/A	Grace Ogot.	1) Cultural context	7
	"The Green Leaves".	2) Tradition vs	
		Modernity	
		3) Textual Analysis	
ENGH-H-DSE-T-4/A	Marxism: a. Antonio	1) Introduction to	7
	Gramosci.	Marxism	
	"The Formation of	2) Organic	
	the Intellectuals" and	Intellectuals	
	"Hegemony (Civil	3) Traditional	
	Society) and	Intellectuals	
	Separation of	4) Role within	
	Powers".	Superstructures	
ENGH-H-DSE-T-4/B	Marxism: b. Louis	1) Ideological State	5
	Althusser.	Apparatuses	
	"Ideology and	(ISA)	
	Ideological State	2) Repressive State	
	Apparatuses".	Apparatuses	

		3) Function of ISAs	
ENGH-H-DSE-T-5/A	Faiz Ahmad Faiz. "For Your Lanes, My Country".	 Political context Resistance and hope 	5
	,	3) Textual Analysis	
ENGH-H-DSE-T-5/B	Amitav Ghosh. "The Shadow Lines".	 Historical facts Complexities of Border Textual Analysis 	7

Department of English

Lesson Plan

Name of the Teacher: Manas Ranjan Chaudhuri

Year: 2018

Part: II

Paper: III

Section	Торіс	Topic of Discussion	Number of Classes
History	1) Brief Historical	1) Tudors,	4
	Outline of the	Absolutist	
	Jacobean Age	Monarchy &	
		the Birth of	
		the Nation	
		State	
		2) Jacobean Age	
		and Divine	
		Kíngship	
		3) Nascent	
		Capitalism,	
		Rise of the	
		Middling Sort	
		of Men	
		4) Early Phase of	
		Colonialism,	
		Discoveries	
		and their	
		Impact	
Poetry	"Forget not yet".	1) Forsaken love	1
	Thomas Wyatt.	2) Passage of	
		time	
		3) Constancy and	
		faithfulness	
Poetry	"To His Love (ii) [One	1) The Power of	1
	day I wrote her name	the Beloved	

	upon strand']".	2)	The	
	Edmund Spenser.		Importance of	
			the Lover's	
			Response	
		3)	The	
			Intertwining of	
			Love and	
			Poetry	
Poetry	"Loving in truth".	1)	The Sonnet	1
	Philip Sidney.	2)	Truthful Love	
			vs. Deceptive	
			Desire	
		3)	The Power of	
			Poetry	
		4)	The Struggle	
			for	
			Recognition	

Part: II

Paper: IV

Section	Торіс	Topic of Discussion	Number of Classes
History	 Brief historical outline of the Restoration Period Brief socio- cultural history 	 Civil War, Commonwealth Restoration Glorious Revolution Rise of the Press and book trade Neoclassicism and Enlightenment Rise of the merchant class 	8
Drama	"She Stoops to Conquer". William Goldsmith.	 Anti-sentimental comedy Class and Social Status Love and Courtship Appearances vs. Reality 	15

Part: III

Paper: V

Section	Торіс	Topic of Discussi	on Number of Classes
Poetry	"The Lamb" and "The	1) British	4
	Tyger"	Romantic	
	William Blake.	poetry	
		2) Songs of	
		Innocence a	and
		Songs of	
		Experience	
		3) Duality and	
		Contrast	
		4) Exploration	of
		, the Divine	
		5) The Role of	
		, Imagination	
Poetry	"After Blenheim".	1) The Cost of	2
	Robert Southey.	War on	
		Ordinary	
		People	
		2) Irony and	
		Disillusionm	nent
		3) The Futility	of
		War	
		4) The Loss of	
		Innocence	
		5) Propaganda	ı
		and	
		Manipulatio	on
Poetry	"Recollections of Early	1) Loss of	5
	Child hood".	Innocence a	and
	William Wordsworth.	the Power o	of
		Childhood	
		Perception	
		2) Nature as a	
		Source of	
		Spiritual	
		Connection	
		3) Memory an	d

		the Power of Imagination	
Novel	"Frankenstein". Mary Shelley.	 Gothic Fiction The Dangers of Science and Ambition Nature vs. Nurture Prejudice and Social Rejection Fate vs. Free Will 	

Part: III

Paper: VI

Section	Торіс	Topic of Discussion	Number of Classes
Poetry	"The Picture Gallery at	1) The Power of	2
	Penhurst".	Family Legacy	
	Elizabeth Barrett	2) The Interplay	
	Browning.	of Past and	
		Present	
		3) The Search for	
		Identity	
		4) Mortality and	
		the	
		Inevitability of	
		Change	
		5) The Power of	
		Art and	
		Memory	
Poetry	"Self-interrogation"	1) Self-Scrutiny	2
	Emily Bronte.	and Existential	
		Doubt	
		2) The Passage of	
		Time and	
		Mortality	
		3) The Search for	
		Personal	
		Fulfillment	
		4) The Power of	
		Choice and	
		Free Will	
Poetry	"To Marguerite".	1) Isolation and	2
	Matthew Arnold.	Longing	
		2) The Power of	
		Memory	
		3) The Passage of	
		Time	
		4) The Elusive	
		Nature of Love	
Prose	"Subjection of Women".	1) Gender	3
	[Extract from Chapter	Inequality as	

	II.]		Injustice	
	John Stuart Mill.	2)	Equality of	
			Rights and	
			Opportunities	
		3)	The	
			Artificiality of	
			Gender Roles	
		4)	Women's	
			Potential and	
			Autonomy	
		5)	The Harm of	
			Legal	
			Subordination	
Prose	"Letter from	1)	Colonial	3
11050	Barrackpore".	-,	Observation	5
	Extract from Letters		and	
	from India. 1872.		Percention	
	Emily Eden.	2)	The	
		_,	Disconnect	
			Between	
			Colonizer and	
			Colonized	
		3)	Social	
			Commentary	
			and Satire	
		4)	The Allure and	
		,	Mystery of	
			India	

Part: III

Paper: VII

Section	Торіс	Topic of Discussion	Number of Classes
Prose	"Two Cheers for Democracy" (1951). E. M. Forster.	 Critique of Totalitarianism The Value of Individualism The Limits of Democracy The Importance of Culture and Art 	3
Prose	"The Mark on the Wall". Virginia Woolf.	 Ant Modernist Fiction Nature and Civilization War Self and the Other Time and Memory 	3
Prose	"Araby". James Joyce.	 Coming of Age Religion and Catholicism Escapism and the Exotic 	3

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Vyasa. "The Dicing"and "The sequel to Dicing".	 Historical and Cultural Background of Indian society Textual Analysis Critical Appreciation 	15
ENGH-H-CC-T-1/B	"The Book of the Assembly Hall". "The Temptation of Karna".	 1) Introduction 2) Textual Analysis 	10
ENGH-H-CC-T-2/B	Sophocles. "Oedipus the king".	 History of Classical Greece Aristotle & Greek Tragedy The Text Translation & 'The Unities Critical Aspects 	15
Part: III

Paper: V

Section	Торіс	Topics of Discussion	Number of Classes
History	 Brief historical outline Brief Socio- cultural history 	 French Revolution Napoleanic wars Cult of Imagination in other arts 	6
Poetry	"This Lime-Tree Bower My Prsion". S.T. Coleridge.	 Imagination and Nature Reconciliation with Confinement Isolation and Reflection Contentment and Reconciliation Lyrical Ode Blank Verse 	3
Poetry	"Kubla Khan". S.T. Coleridge.	 Fragmentary Nature Romantic Ideals Allusion and Myth Mysterious and Enigmatic 	2
Poetry	"Ode to the West Wind". P.B. Shelley.	 Ode West Wind: Represents natural power and transformation. Autumn and Winter: Symbols of decay and renewal. 	3

Part: III

Paper: VI

Горіс	Topic	s of	Number of Classes
	Discu	ssion	
Drama	1)	Comedy	2
	2)	Tragedy	
	3)	Tragic-	
		comedy	
"In the Bleak	1)	Nativity	2
Midwinter".	2)	Humanity and	
Christina Rossetti.		Humility	
	3)	Personal	
		Devotion	
"Lilies of Queen's	1)	Art and Nature	3
Garden".	2)	Moral and	
John Ruskin.		Aesthetic	
		Value	
	3)	Critique of	
		Industrializatio	
		n	
	4)	Symbolism of	
	Topic Drama "In the Bleak Midwinter". Christina Rossetti. "Lilies of Queen's Garden". John Ruskin.	TopicTopicDiscuDrama1)2)3)"In the Bleak1)Midwinter".2)Christina Rossetti.3)"Lilies of Queen's1)Garden".2)John Ruskin.3)4)	TopicTopics of DiscussionDrama1)Comedy 2)Tragedy 3)3)Tragic- comedy"In the Bleak1)NativityMidwinter".2)Humanity and HumilityChristina Rossetti.3)Personal Devotion"Lilies of Queen's Garden".1)Art and Nature Aesthetic ValueJohn Ruskin.1)Art and nature Aesthetic Value3)Critique of Industrializatio n4)Symbolism of lilles

Part: III

Paper: VII

Section	Торіс	Topic	s of Discussion	Number of Classes
History	Poetry	1)	Lyric	2
		2)	The Epic	
		3)	The Ode	
		4)	The Sonnet	
Poetry	"Musee des Beaux	1)	Indifference to	2
	Arts".		Suffering	
	W.H. Auden.	2)	Art and Reality	
		3)	Historical and	
			Mythological	
			Contexts	
Poetry	"Fern Hill".	1)	Nostalgia and	2
	Dylan Thomas.		Innocence	
		2)	Themes of	
			Time and	
			Transience	
		3)	Mythical	
			Quality	
Poetry	"The Whitsun	1)	Observation of	3
	Weddings".		Ordinary Life	
	Philip Larkin.	2)	Contrast	
			Between Public	
			and Private	
			Lives	
		3)	Themes of	
			Social	
			Conformity	
Novel	"England England".	1)	Satire and	20
	Julian Barnes.		Parody	
		2)	The Concept of	
			England,	
			England	
		3)	Themes of	
			Authenticity	
			and Artificiality	
		4)	Critique of	
			Modern Society	

Semester: 1st

Course code/ Unit	Торіс	Topics of	Number of classes
		discussion	
ENGH-H-CC-T-1/A	Vyasa.	4) Historical and	15
	"The Dicing" and "The	Cultural	
	sequel to Dicing".	Background of	
		Indian society	
		5) Textual	
		Analysis	
		6) Critical	
		Appreciation	
ENGH-H-CC-T-2/B	Sophocles.	6) History of	15
	"Oedipus the king".	Classical	
		Greece	
		7) Aristotle &	
		Greek Tragedy	
		8) The Text	
		9) Translation &	
		'The Unities	
		10) Critical	
		Aspects	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Ilango Adigal.	1) Introduction to	15
	"The Book of Banci".	Epic and Tamil	
		Epic	
		2) Themes of the	
		poem	
		3) Feministic	
		perspective	
ENGH-H-CC-T-2/A	Ovid.	1) Theme of	20
	Selections from	transformation	
	"Metamorphoses".	2) Mythological	
		stories	
		3) Human emotion	
		and relations	
		4) Textual Analysis	

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/A	Robin S. Ngangom.	1) Manipur	5
	"The Strange Affair of	conflict	
	Robin S. Ngangom",	2) Cultural	
	"A Poem for	contexts	
	Mother".	3) Textual Analysis	
		4) Critical	
		Appreciation	
ENGH-H-CC-T-3/A	Toru Dutt.	1) Themes and	3
	"Our Casuarina Tree".	context of	
		Indian English	
		literature	
		2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-4/A	Edmund Spencer.	1) Introduction to	3
	"One day I wrote her	Spenserian	
	name".	sonnet	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Edgar Allan Poe. "The Purloined Letter"	 Background history of American literature Introduction to the Text Textual Analysis 	5
ENGH-H-CC-T-5/B	Tennessee Williams. "The Glass Menegerie".	 Gender roles Escapism familial responsibility and unfulfilled desire. 	10
ENGH-H-CC-T-6/A	Durgabai Vyam and Subhash Vyam. "Bhimayana".	 Caste Discrimination Social justice 	5
ENGH-H-CC-T-7/A	Aphra Behn. "The Rover".	 Introduction Detail analysis of the text 	5

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/B	Jonathan Swift.	1) Satirical	7
	"Gulliver's Travels".	Comedy	
		Moral aspects	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-9/B	George Gordon	1) Byronic hero	5
	Byron.	Travelogue and	
	"Childe Harold's	exploration	
	Pilgrimage".	3) Theme of	
		Alienation and	
		Exile	
ENGH-H-CC-T-9/B	Mary Shelley.	1) Gothic fiction	5
	"Frankenstein".	2) The monster	
		and human	
		3) Theme of	
		Alienation and	
		hubris	
ENGH-H-CC-T-10/A	Christina Rossetti.	1) Introduction of	4
	"The Goblin Market".	the Age	
		2) Victorian	
		Morality	
		3) Themes of	
		Temptations	
		and desire	
ENGH-H-CC-T-10/B	Charlotte Bronte.	1) Discussion on	4
	"Jane Eyre".	Jane Eyre	
		2) Feminist	
		Perspective	
		 3) Textual Analysis 	

Semester: 5th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-11/A	Emily Dickinson.	1) Introduction to	3
	"I cannot live with	the poem	
	you", "l'm 'wife'-l've	2) Feminist	
	finished that".	Perspective	
		Critical Analysis	
ENGH-H-CC-T-11/B	Mary Wollstonecraft.	1) Feminism	7
	"A Vindication of the	2) Waves of	
	Rights of Woman".	Feminism	
		Rights of	
		woman	
ENGH-H-CC-T-12/A	Dovid Herbert	1) Theme of	4
	Lawrence.	Isolation	
	"Odour of	2) Family dynamics	
	Chrysanthemums".	Complexities of	
		human	
		relationship	
ENGH-H-CC-T-12/A	Virginia Woolf.	1) Complexities of	4
	"Mark on the Wall".	Perception and	
		Consciousness	
		2) Stream of	
		consciousness	
ENGH-H-CC-T-12/A	W. Somerset	1) Themes of	5
	Maugham.	morality,	
	"Rain"	hypocrisy and	
		cultural clashes	
		2) Colonialism	
ENGH-H-DSE-T-2/A	Seamus Heaney.	1) Irish Identity	7
	"Digging" and "	Violence and	
	Casualty".	loss	
		Textual Analysis	
ENGH-H-DSE-T-2/A	Carol Anne Duffy.	1) Theme of	4
	"Text" and "Stealing".	Isolation	
		2) Existential angst	
		3) Textual Analysis	
ENGH-H-DSE-T-3/B	I.A. Richards.	1) Methods of	7
	"Principles of Literary	analysing	
	Criticism".	literature	

	2) Close Reading	
	3) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Ilango Adigal.	1) Introduction to	15
	"The Book of Banci".	Epic and Tamil	
		Epic	
		Themes of the	
		poem	
		3) Feministic	
		perspective	
ENGH-H-CC-T-2/A	Ovid.	1) Theme of	20
	Selections from	transformation	
	"Metamorphoses".	2) Mythological	
		stories	
		3) Human emotion	
		and relations	
		4) Textual Analysis	

Semester: 2nd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-3/A	Robin S. Ngangom.	1) Manipur	5
	"The Strange Affair of	conflict	
	Robin S. Ngangom ",	2) Cultural	
	"A Poem for Mother".	contexts	
		Textual Analysis	
		4) Critical	
		Appreciation	
ENGH-H-CC-T-3/A	Nissim Ezekiel.	 India writing in 	3
	"Enterprise".	English	
		2) Title of the	
		poem	
		3) Textual Analysis	
ENGH-H-CC-T-3/B	Girish Karnad.	1) Introduction to	10
	"Hayavadana".	the Text	
		2) Mythology,	
		folklore	
		3) Theme of.	
		Identity, desire	
ENGH-H-CC-T-4/A	Fransis Bacon.	1) Short	5
	"Of Empire".	Introduction on	
		Essay	
		2) Textual Analysis	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Martin Luther King. "I Have a Dream".	1) Equality and brotherhood	3
		2) Introduction to	
ENGH-H-CC-T-5/B	Toni Morrison. "Beloved".	1) History of Slavery 2) Textual Analysis	3
ENGH-H-CC-T-6/A	Shyam Selvadurai. "Funny Boy".	 Coming of Age and Identity Ethnic Conflict Loss of Innocence 	7
ENGH-H-CC-T-7/A	John Milton. "Paradise Lost". Bk1.	 The characterizatio n of Satan The nature of Evil The role of God The Epic Hero 	10

Semester: 4th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-8/B	Jonathan Swift.	1)	Satirical Comedy	7
	"Gulliver's Travels".	2)	Moral aspects	
		3)	Critical Appreciation	
ENGH-H-CC-T-9/A	William Blake.	1)	Introduction of the	7
	"The Lamb", "The		Era	
	Chimney Sweeper",	2)	Symbolism used in	
	"The Tyger".		the poem	
		3)	Textual Analysis	
		4)	Critical Appreciation	
ENGH-H-CC-T-9/A	Robert Burns.	1)	Historical context	4
	"A Bard's Epitaph"	2)	Scottish Nationalism	
	and " Scots	3)	Textual Analysis	
	WhaHae".			
ENGH-H-CC-T-9/A	William	1)	The poet's	5
	Wordsworth.		relationships with	
	"Tintern Abbey".		nature	
		2)	Memory and	
			reflection	
		3)	The passage of time	
ENGH-H-CC-T-10/A	Alfred Tennyson.	1)	Quest for	3
	"Ulysses".		Adventure	
		2)	Spirit of heroism	
		3)	Yearning for Glory	
ENGH-H-CC-T-10/A	Robert Browning.	1)	Introduction to	3
	"My Last Duchess".		dramatic	
			Monologue	
		2)	Characterization	
		3)	Theme of Power	
			and control	

Semester: 5th

Course code/	Торіс	Topics of discussion	Number of
ENGH-H-CC-T-11/A	Rassundari Debi. "Amar Jiban".	 Bengali literature Feminist Perspective Textual Analysis 	5
ENGH-H-CC-T-11/B	Alice Walker. "The Color Purple".	 Introduction Feminist Perspective Homosexuality 	6
ENGH-H-CC-T-12/A	Thomas Stearns Eliot. "The Love Song of J. Alfred Prufrock", "Preludes", "Hollow Men".	 Alienation Urban Decay Struggle for Self – Expression 	6
ENGH-H-CC-T-12/B	John Millington Synge. "Riders to the Sea".	 1) Irish literary revival 2) Textual Analysis 3) Critical Analysis 	4
ENGH-H-DSE-T-2/A	Phillip Larkin. "Whitsun Weddings" and "Church Going".	 Modernism Cultural context Textual Analysis 	7
ENGH-H-DSE-T-2/B	John Osborne. "Look back in Anger".	 Post-Modern Era Kitchen sink drama Class difference 	6
ENGH-H-DSE-T-3/B	I.A. Richards. "Principles of Literary Criticism".	 Methods of analysing literature Close Reading Textual Analysis 	7

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Henrik Ibsen.	1) Psychological	10
	"Ghosts".	realism	
		Social hypocrisy	
		3) The Ghost of the	
		Past	
ENGH-H-CC-T-14/A	Bessie Head.	1) Gender roles	5
	"The Collector of	and Power	
	Treasures".	2) Social Hierarchy	
		Cultural context	
ENGH-H-CC-T-14/A	Ama Ata Aidoo.	1) Postcolonial	5
	"The Girl Who Can".	Themes	
		2) Gender	
		dynamics	
		Textual Analysis	
ENGH-H-CC-T-14/A	Grace Ogot.	1) Cultural context	7
	"The Green Leaves".	2) Tradition vs	
		Modernity	
		Textual Analysis	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Colonialism	5
	a. Mahatma Gandhi.	2) Post-Colonialism	
	"Passive Resistance"	Gandhi's idea of	
	and	history	
	"Education".	Gandhi's idea of	
		passive	
		resistance	
		5) Gandhi's	
		thoughts on	
		western	
		education	
		6) Gandhi's	
		concepts of	
		education	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Post-	5
	b. Edward Said.	Colonialism	
	"The Scope of	2) The East and the	
	Orientalism".	West	
		Textual Analysis	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Nationalism	5

	c. Aijaz Ahmad. "Indian Literature: Notes towards the Definition of a	 Language and Culture Textual Analysis 	
	Category".		_
ENGH-H-DSE-T-5/A	Gulzar.	1) Introduction	5
	"Toba Tek Singh".	2) Textual Analysis	
		Critical Analysis	
ENGH-H-DSE-T-5/B	Intizar Husain.	1) Themes of	5
	"Basti".	identity,	
		displacement,	
		and the	
		partition of	
		India.	
		2) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Vyasa.	1) Historical and	15
	"The Dicing" and "The	Cultural	
	sequel to Dicing"'	Background of	
		Indian society	
		2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-2/A	Ovid.	1) Theme of	20
	Selections from	transformation	
	"Metamorphoses".	2) Mythological	
		stories	
		3) Human emotion	
		and relations	
		4) Textual Analysis	

Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/ A	Shashi Deshpande.	1) Introduction to the	7
	"The Intrusion".	Author	
		2) Textual Analysis	
		3) Feminist	
		Perspective	
ENGH-H-CC-T-3/A	Kamala Das.	 Introduction to the 	3
	"Introduction".	Text	
		2) Confessional	
		poetry	
		3) Feminist	
		Perspective	
ENGH-H-CC-T-3/A	Robin S. Ngangom.	1) Manipur conflict	5
	"The Strange Affair	Cultural contexts	
	of Robin S. Ngangom	Textual Analysis	
	", "A Poem for	4) Critical	
	Mother".	Appreciation	
ENGH-H-CC-T-4/A	Johne Donne.	1) Brief Introduction	7
	"The Sunne Rising	to Metaphysical	
	"and "Valediction	poet	
	Forbidding".	2) Characteristics of	
		Metaphysical	
		poem	
		3) Textual	
		Interpretation	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Abraham Lincoln. "Gettysburg Address".	 Slavery system in America Introduction to the Text 	3
ENGH-H-CC-T-6/A	Shyam Selvadurai. "Funny Boy".	 Coming of Age and Identity Ethnic Conflict Loss of Innocence 	7
ENGH-H-CC-T-7/A	Aphra Behn. "The Rover".	 Introduction Detail analysis of the text 	5

Semester: 4th

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-8/A	Thomas Gray.	1) Introduction to Elegy	5
	"Elegy Written in a	2) Romantic elements	
	Country	Neo classical	
	Churchyard".	elements	
ENGH-H-CC-T-9	Percy Bysshe	1) Romanticism	3
	Shelley.	2) Introduction to Ode	
	"Ode to the West	Power of Nature	
	Wind".	4) Prophetic Vision	
ENGH-H-CC-T-9/A	Samuel Taylor	1) Introduction	5
	Coleridge.	2) Imagination and	
	"khubla Khan",	creative process	
	"Dejection: An	3) The limitation of	
	Ode".	human memory	
ENGH-H-CC-T-10/A	Alfred Tennyson.	1) Quest for Adventure	3
	"Ulysses".	2) Spirit of heroism	
		3) Yearning for Glory	
ENGH-H-CC-T-10/A	Robert Browning.	1) Introduction to	3
	"My Last Duchess".	dramatic Monologue	
		2) Characterization	
		3) Theme of Power and	
		control	

Semester: 5th

Course code/	Торіс	Topic	s of discussion	Number of
Unit				classes
ENGH-H-CC-T-11/A	Rassundari Debi.	1)	Bengali literature	5
	"Amar Jiban".	2)	Feminist	
			Perspective	
		3)	Textual Analysis	
ENGH-H-CC-T-11/B	Alice Walker.	1)	Introduction	6
	"The Color Purple".	2)	Feminist	
			Perspective	
		3)	Homosexuality	
ENGH-H-CC-T-12/A	Thomas Stearns	1)	Alienation	6
	Eliot.	2)	Urban Decay	
	"The Love Song of J.	3)	Struggle for Self –	
	Alfred Prufrock",		Expression	
	"Preludes", "Hollow			
	Men".			
ENGH-H-CC-T-12/B	John Millington	1)	Irish literary	4
	Synge.		revival	
	"Riders to the Sea".	2)	Textual Analysis	
		3)	Critical Analysis	
ENGH-H-DSE-T-2/A	Phillip Larkin.	1)	Modernism	7
	"Whitsun Weddings"	2)	Cultural context	
	and "Church Going".	3)	Textual Analysis	
ENGH-H-DSE-T-2/B	John Osborne.	1)	Post-Modern Era	6
	"Look back in	2)	Kitchen sink	
	Anger".		drama	
		3)	Class difference	
ENGH-H-DSE-T-3/B	Cleanth Brooks.	1)	Cleanth Brooks	5
	"The Heresy of	2)	Introduction	
	Paraphrase".	3)	Textual Analysis	

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Samuel Beckett.	1) Existential	10
	"Waiting for Godot".	themes	
		2) Absurdity	
		3) Textual Analysis	
ENGH-H-CC-T-14/A	Bessie Head.	1) Gender roles	5
	"The Collector of	and Power	
	Treasures".	2) Social Hierarchy	
		Cultural context	
ENGH-H-CC-T-14/A	Ama Ata Aidoo.	1) Postcolonial	5
	"The Girl Who Can".	Themes	
		2) Gender	
		dynamics	
		3) Textual Analysis	
ENGH-H-CC-T-14/A	Grace Ogot.	1) Cultural context	7
	"The Green Leaves".	2) Tradition vs	
		Modernity	
		3) Textual Analysis	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Colonialism	5
	a. Mahatma Gandhi.	2) Post-Colonialism	
	"Passive Resistance"	3) Gandhi's idea of	
	and	history	
	"Education".	4) Gandhi's idea of	
		passive	
		resistance	
		5) Gandhi's	
		thoughts on	
		western	
		education	
		6) Gandhi's	
		concepts of	
		education	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Post-	5
	b. Edward Said.	Colonialism	
	"The Scope of	2) The East and the	
	Orientalism."	West	
		3) Textual Analysis	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Nationalism	5
	c. Aijaz Ahmad.	2) Language and	

	"Indian Literature:	Culture	
	Notes towards the	3) Textual Analysis	
	Definition of a		
	Category".		
ENGH-H-DSE-T-5/A	Gulzar.	1) Introduction	5
	"Toba Tek Singh".	2) Textual Analysis	
		3) Critical Analysis	
ENGH-H-DSE-T-5/B	Intizar Husain.	1) Themes of	5
	"Basti".	identity,	
		displacement,	
		and the partition	1
		of India.	
		2) Textual Analysis	

Semester: 1st

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-1/A	Vyasa.	1) Historical and	15
	"The Dicing" and "The	Cultural	
	sequel to Dicing".	Background of	
		Indian society	
		2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-2/A	Ovid.	1) Theme of	20
	Selections from	transformation	
	"Metamorphoses".	2) Mythological	
		stories	
		3) Human emotion	
		and relations	
		4) Textual Analysis	

Semester: 2nd

Course code/	Торіс	Topics of discussion	Number of
Unit			classes
ENGH-H-CC-T-3/A	Amitav Ghosh.	1) Historical context	15
	"The Ghosts of Mrs	2) Environmental	
	Gandhi".	concerns	
		Global Challenges	
		Civil Disobedience	
		5) Critique and	
		Reflection	
ENGH-H-CC-T-3/A	Robin S. Ngangom.	1) Manipur conflict	5
	"The Strange Affair	2) Cultural contexts	
	of Robin S.	Textual Analysis	
	Ngangom", "A Poem	4) Critical	
	for Mother".	Appreciation	
ENGH-H-CC-T-3/B	Girish Karnad.	1) Introduction to	10
	"Hayavadana".	the Text	
		2) Mythology,	
		folklore	
		3) Theme of.	
		Identity, desire	
ENGH-H-CC-T-4/A	Geoffrey Chaucer.	1) Introduction to	7
	"Wife of Bath".	the Text	
		2) Textual Analysis	
		3) Feminist	
		Perspective	

Semester: 3rd

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-5/A	Martin Luther King. "I Have a Dream".	 Equality and brotherhood 	3
		2) Introduction to the Text	
ENGH-H-CC-T-5/B	Toni Morrison. "Beloved".	 History of Slavery Textual Analysis 	3
ENGH-H-CC-T-6/A	Shyam Selvadurai. "Funny Boy".	 Coming of Age and Identity Ethnic Conflict Loss of Innocence 	7
ENGH-H-CC-T-7/A	John Milton. "Paradise Lost". Bk1.	 The characterizatio n of Satan The nature of Evil The role of God The Epic Hero 	10

Semester: 4th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-8/B	Jonathan Swift.	1) Satirical	7
	"Gulliver's Travels".	Comedy	
		Moral aspects	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-9/B	George Gordon	1) Byronic hero	5
	Byron.	Travelogue and	
	"Childe Harold's	exploration	
	Pilgrimage".	3) Theme of	
		Alienation and	
		Exile	
ENGH-H-CC-T-9/B	Mary Shelley.	1) Gothic fiction	5
	"Frankenstein".	2) The monster	
		and human	
		3) Theme of	
		Alienation and	
		hubris	
ENGH-H-CC-T-10/A	Christina Rossetti.	1) Introduction of	4
	"The Goblin Market".	the Age	
		2) Victorian	
		Morality	
		3) Themes of	
		Temptations	
		and desire	
ENGH-H-CC-T-10/B	Charlotte Bronte.	 Discussion on 	4
	"Jane Eyre".	Jane Eyre	
		2) Feminist	
		Perspective	
		3) Textual Analysis	

Semester: 5th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-11/A	Sylvia Plath. "Daddy", " Lady Lazarus".	 Confessional poetry Discussion on Sylvia Plath's life and her works 	5
ENGH-H-CC-T-11/A	Katherine Mansfield. "Bliss"	 Upper society in England Feminist Perspective Homosexuality 	3
ENGH-H-CC-T-12/A	Thomas Stearns Eliot. "The Love Song of J. Alfred Prufrock", "Preludes", "Hollow Men".	 Alienation Urban Decay Struggle for Self – Expression 	6
ENGH-H-CC-T-12/B	John Millington Synge. "Riders to the Sea".	 1) Irish literary revival 2) Textual Analysis 3) Critical Analysis 	4
ENGH-H-DSE-T-2/A	Ted Hughes. "Hawk Roosting " and " Crow's Fall".	 Perspective of the Hawk Natural instinct Control and Mastery Nature and Natural order 	6
ENGH-H-DSE-T-3/B	Cleanth Brooks. "The Heresy of Paraphrase".	 Cleanth Brooks Introduction Textual Analysis 	5

Semester: 6th

Course code/ Unit	Торіс	Topics of discussion	Number of classes
ENGH-H-CC-T-13/A	Anton Chekov.	1) Subtext and	10
	"The Seagull".	Psychological	
		depth	
		2) Art and	
		Creativity	
		3) Textual Analysis	
ENGH-H-CC-T-13/B	Bertrolt Brecht.	1) Epic theatre	10
	"The Good Person of	2) Dual Identity	
	Szechwan".	3) Redemption	
		and Sacrifice	
ENGH-H-CC-T-13/B	Eugene Ionesco,	1) Absurdity and	10
	"Rhinoceros" .	Surrealism	
		Conformity and	
		Mass	
		Movement	
		3) Textual Analysis	
ENGH-H-CC-T-13/B	Luigi Pirandello.	1) Meta-theatrical	10
	"Six Characters in	2) Identity and	
	Search of an Author".	reality	
		3) Theatrical	
		illusion	
ENGH-H-CC-T-14/A	Pablo Neruda.	1) Universality of	4
	"Tonight I Can Write	human	
	<i>", "</i> The Way Spain	experience	
	Was".	2) Textual Analysis	
		3) Critical	
		Appreciation	
ENGH-H-CC-T-14/A	Derek Walcott.	1) Colonialism	5
	"A Far Cry from	Complexities of	
	Africa ", "Names".	identity	
		Textual Analysis	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1) Colonialism	5
	a. Mahatma Gandhi.	2) Post-	
	"Passive Resistance"	Colonialism	
	and	3) Gandhi's idea of	
	"Education".	history	
		4) Gandhi's idea of	
		passive	

		5)	resistance Gandhi's	
		,	thoughts on	
			western	
			education	
		6)	Gandhi's	
		,	concepts of	
			education	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1)	Post-	5
	b. Edward Said. "The		Colonialism	
	Scope of	2)	The East and	
	Orientalism."	-	the West	
		3)	Textual Analysis	
ENGH-H-DSE-T-4/A	Postcolonial Studies:	1)	Nationalism	5
	c. Aijaz Ahmad.	2)	Language and	
	"Indian Literature:		Culture	
	Notes towards the	3)	Textual Analysis	
	Definition of a			
	Category".			
ENGH-H-DSE-T-5/A	Gulzar.	1)	Introduction	5
	"Toba Tek Singh".	2)	Textual Analysis	
		3)	Critical Analysis	
ENGH-H-DSE-T-5/B	Intizar Husain.	1)	Themes of	5
	"Basti".		identity,	
			displacement,	
			and the	
			partition of	
			India.	
		2)	Textual Analysis	

Department of English

Lesson Plan

Name of the Teacher: Shahabuddin Ahammed

Year: 2018

Part: II

Paper: III

Sections	Торіс	Topics of Discussion	Number of
			Classes
History	Drama	 Comedy: romantic, pastoral and citizen comedy Tragedy: revenge tragedy, classical tragedy, tragic- comedy Problem plays 	7
Poetry	"Sonnet 116" (Let	1) Theme of Love	3
	me not to the	2) Definition of Love	
	marriage').	3) Timelessness	
	William	4) Final Assertion	
	Shakespeare		
Poetry	"Sonnet 130".	1) Comparison with	3
	William	Natural and Cultural	
	Shakespeare.	Norms	
		Acknowledgment of	
		Imperfections	
		3) Declaration of Love	
Poetry	"The Sunne Rising".	1) Metaphysical poem	3
	John Donne.	2) Conceit of Love	
		3) Defiance of Time	
		and Space	
		Humor and Wit	
Prose	Extract from "A	1) Context of	2
	Faithful Admonition	Persecution	
	to the Professor of	2) Call to Faithfulness	
	God's Truth in	3) Covenantal	

England". John Knox.	Language 4) Defense of	
	Protestant Doctrine	

Part: II

Paper: IV

Sections	Торіс	Topics of Discussion	Number of
			Classes
Poetry	"The Retreat". Henry Vaughan.	 Metaphysical Themes Reflection on Childhood Innocence Yearning for Spiritual Purity Desire for Redemption 	2
Poetry	"To His Coy Mistress". Andrew Marvell.	 Carpe Diem Theme Flattery and Persuasion Sense of Urgency Conclusion and Moral 	2
Poetry	"The Rape of the Lock" Cantos I & II. Alexander Pope.	 Mock-Heroic Style The Feminine Perspective Heroic Couplet Social Commentary 	12
Essay	"The Vision of Justice". Joseph Addison.	 Description of Justice Critique of Injustice Context and Purpose 	2
Essay	"Recollection of Childhood". Richard Steele.	 Sentimental Reflection Innocence and Joy Family and 	2

		Relationships	
Essay	"Beau Tibbs".	1) Fashionable and	2
	Oliver Goldsmith.	Pompous	
		2) Social Climber	
		3) Comic Relief	
		4) Symbol of Social	
		Critique	

Part: III

Paper: V

Sections	Торіс	Topics of Discussion	Number of
			Classes
History	Drama	 Tragedy Tragedy Classical Tragedy Tragedy in the Elizabethan Period Modern Tragedy Tragicomedy Tragicomedy Comedy Comedy of Humors Romantic Comedy Comedy of Manners Farce 	2
Prose	"Going on a Journey" William Hazlitt.	 Joy of Solitude Escape from Routine Reflection and Introspection Connection with Nature Sense of Discovery 	3
Prose	"The Literature Of Knowledge And The CA Literature Of Power". Thomas De Quincey.	 Informative Function Didactic Purpose Transient Impact Aesthetic and Emotional Impact Enduring Influence Transformative Nature 	4
Novel	"Northanger Abbey." Jane Austen.	 Parody of Gothic Novels Catherine Morland Reality vs. Imagination 	15
4) Coming of Age			

5) Meta-Fictional			
Elements			

Part: III

Paper: VI

Sections	Торіс	Topics of Discussion	Number of
			Classes
History	Poetry	1) Epic Poetry	3
		2) The Ode	
		3) The Sonnet	
		a) Italian Sonnet	
		b) English Sonnet	
		c) Spenserian Sonnet	
		4) Mock-Epic	
Novel	"David Copperfield".	1) Bildungsroman	20
	Charles Dickers.	2) Autobiographical	
		Elements	
		3) Character	
		Development	
		Social Class and	
		Mobility	
		5) Resilience and	
		Perseverance	
		6) Social Critique	
		7) Redemption and	
		Forgiveness	
		8) Virtue and vice	

Part: III

Paper: VII

Sections	Торіс	Topics of	Number of Classes
		Discussion	
History	Drama		3
Prose	"The Ox".	1) Themes of	4
	H.E Bates.	hardship,	
		dignity, and	
		sacrifice in	
		rural England	
		2) Dignity in	
		Labor	
Prose	"The Fly".	1) Grief and Loss	2
	Katherine Mansfield.	2) Power and	
		Control	
		Resilience and	
		Futility	
Prose	"The Englishman's	1) Theme of	3
	House".	Home and	
	Evelyn Waugh.	Identity	
		2) Satire and	
		Humor	
		3) Englishman	
		Archetype	
		Tradition and	
		Modernity	
		5) Anecdotal	
Drama	"Look Back in Anger".	1) Kitchen sink	20
	John Osborne.	drama	
		2) Anger and	
		Disillusionmen	
		t	
		Angry Young	
		Man	
		4) Alienation	
		5) Class conflict	
		6) Critique of the	
		Establishment	
		7) The Bear and	

	Squirrel Game	

Part: II

Paper: V

Section	Торіс	Topic of Discussion	Number of
			Classes
History	Prose	1) Novel	6
		2) Essay	
Prose	"Dream Children: A	1) Essay	4
	Reverie"	2) Themes of Loss and	
	Charles Lamb.	Longing	
		3) Imaginary Children	
		4) Autobiographical	
		Elements	
Prose	"Chimney	1) Occupation and	4
	Sweepers" Charles	Hardships	
	Lamb.	2) Fear and Challenges	
		Generosity and Loss	
		4) Unique Voices	
Prose	"Christ's Hospital	1) Privileges and	5
	Five-and-Thirty	Loneliness	
	Years Ago" .	Food and Nurses	
	Charles Lamb.	Harsh Discipline	
		4) Autobiographical	
		Insights	

Part: III

Paper: VI

Section	Торіс	Topic of Discussion	Number of Classes
History	1) Brief historical	1) Reform Acts	10
	outline	2) Women's	
	2) Brief socio-	Suffrage	
	cultural	3) Empire	
	history	4) Condition of	
		the Working	
		Class	
		5) Science and	
		Religion	
		6) Leisure and	
		Amusement	
Drama	"Riders to the Sea".	1) Fate and	15
	John Millington	Destiny	
	Synge.	2) Nature's	
		Power	
		3) Loss and Grief	
		4) Language and	
		Style	

Part: III

Paper: VII

Section	Торіс	Topic of Discussion	Number of Classes
History	Prose	1) Novel	5
		2) Essay	
Poetry	"Digging".	1) Theme of	2
	Seamus Heaney.	Identity	
		2) Connection to	
		Nature	
		Family and	
		Tradition	
Poetry	"Hawk Roosting".	1) Perspective	2
	Ted Hughes.	and Voice	
		2) Power and	
		Control	
		Nature and	
		Instinct	
Prose	"The Kiss".	1) Desire and	3
	Angela Carter.	Temptation	
		Identity and	
		Transformatio	
		n	
		3) Power	
		Dynamics	

Departmental maeting

Maeting No: 7 Date of Mading: 08-11-2016. Vanua: College Libersy.

Taackage Paavant:

1. Squar about .

- 2. Subhadip Bhownik 05/0/2015
- 3. Chiranjit Mondal 08/11/2016.
- 4. Satury Johan Kan ostil 2016

It is goodlad that:

- 1. To improve the aristing topching-logning process the topchere of the department will use ITC in the class norm. The are neguested to make 'Pourse Rint' procentiations by the important topics the topch applications. It is also suggested that 'Topching through web cam will be tailed so another mappe of teaching to make the topics more understandable and if may involve the experienced therefore from the other Colleges in the distance, if possible.
- a. 'As appagemented calorday' indicates some sominages will be organised by the department passibly in the month of Januag, 2017.

3. The 'Aspaqtimental Time Table' mill be prepared before the bagining of the 60 that there will be no parablem to commence classed elastes on and from the first day of next Academic Yerq.i.e. 2017-18. Also classes mill be distributed in the same manner and mymbrag as it end done in the same manner and mymbrag as it end done in the same manner and mymbrag as it end done if are necessary. Eo:
AD: I/I, 11/11, and VIII papers.
61K: I/I, II/II, and VIII papers.

A dependential mosting will be hold on at 2 symmetry pm in the 'Library' to discuss the following agords: All concerned are acquared to be present in the mating

Agenda:

1. Padposition of "Apastmental Academic Celendary!

2. Padpardtion of the 'Lesson Plan'.

3. Dagquisation of 'abpactmental bonings'.

4. Organization of 'Class Tasts'

5. Mibcelloneoub.

Place: Domikal, 1968 College, Data: 03.07.2017. Agnar solonotin H.O.P.

Bead of the Department Dept of Political Science Dumical College, Murshidabad Dumical College, Murshidabad

Chiranjit Wordal 05.07.17

Subhadip Bhamik =5/-7/19

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Maching No.: 8 Autor of Maaling: Name of Mading: Library

Teachage pacent:

1 Sange about.

2 Subbady Brownik

s. Samin Mondal,

It is appoind that:

- 1. A "Depositmental Academic Calenda" will be perposed for to gun the bashing leagning parameter
- 2. A populational "Depositmental "Lasson Plan" will be propagal by the coming academic Develor (2017-18) and make infrinting progred in the General Time Table of the College.
- 3. Apaglomontal barrings(s) will be appriately for the etidants in the month of rosenacts as montional in the performic aplantes.
- 4. Depaybount will accord "Integral Tasks' by student (thout fit is ground) filming CBCS format in analy consulty. And the annuage souther shall be exploated in time. within stipulated time.
- 5. Reptimental teachers are requested to submit "function topoge" of the above-sold Tests well before the time of Tests, so that Tests shall be analysised smoother.

Notice

A dependential matting will be hold on 05/07/2022 at as a prin 'conference Rom' to discuss the following agende. All concerned keychese one sequented to be present in the meeting.

Agonda:

1. Radparation of "Advantational Academic Calender" as pag CBCG.

2. Rapposition of the 'Lasson plan'

3. aapprisation of 'departmental somirage!

04. Openizations of 'Integral Tests' as pag CBCS.

os. Miscellangoub.

Place: Dumkal College. Bate: 14.05.2018. Sgrav Abroth.

HO.D,

Ablitical Esiesce. Head of the Department Dept of Political Science Dumkal College, Murshidabad

appartmental Meating

Marting No.: 9 Solte of Marting: 05/07/4018 Nonue of Marting: Conference from

Mombors poracant: 1 Lonal almost 2. Samine Mondal. 8. Sichadig Blownik

After discussion resolved that:

1/ The 'Departmental Time Table' is prepared in keeping with the 'Master Time Table' of the College.

2/ 'Lesson Plans' following CBCS shall be prepared by the end of the next week.

3/ Department will organize a Seminar on a topic relevant and beneficial to the students in the month of December.

4/ All teachers are requested to submit Question Papers for the Internal Tests (CBCS) in time whenever the same will be decided to be held.

57 All concerned are requested not to take leave without prior intimation of the College authority during the session.

Notice:

A depositmental meeting will be held on o4th actives, 2018 at 03.00 pm in the Conference Room' to discuss the following agents. All concegned teachings are acquarted to be present in the mating.

Agondo: (2) Distailution of cangeous groung mark appointed logislass (also existing acs).

(2) botting of grastion labore by 'Inflored Teaks' (CCI.CCI.FE and CC). (3) Re-outing of the existing geodemic dependence fal 'Time Toble'

Place. Dymikał College sobe: 27/09/2018

Sarar about.

HO.R. Political biorco Dept of Frontice School Purchal College, Murchadamet

Hapejin Halsenen 27.09.18

Gikata mondal 27.09.2018

Stendip Chamik 27/20/18

a stall Repugbonantial Mooting. to apply called a large at Macting No: 10 Bata of Maching: 04/10/2018 Volue of Maching: Teachers possent: Aures. the share were account in articlastic and it 1 Agnar Abrok. 09/0/18. 2 Subesti Bhownik 04/10/18 3 Samin Mondals 4/10/18 4 Hapein Harsana Aliolus 5 Srikouta monday 4. 10,018 abusha manaka sect felinat delease Plane Destate College Saleten interes

Teachers	First Year: CBCS, 2018-19				Second Year, KU: 2018-19		Third Kl 2019	Total No. of Classes	
	CCI	CC2	GE	CC	Hons.	Gen.	Hons.	Gen	
AD	Unit: 01 & 02	Unit: 03 V	Unit: 01 & 02	Unit: NIL	Paper: IV/II	Paper: NIL	Paper: VII/I	Paper: NIL	16
SB	Unit: 03	Unit: 06	Unit: 03 (Parts)	Unit: NIL	Paper: 111/1	Paper: 11/11	Paper: VI/I & VIII/I	Paper: (Parts)	12
SLM	Unit: 04	Unit: 02	Unit: NIL	Unit: 02, 03, & 04,	Paper: 111/1 & 111/11	Paper: III/I	Paper: V/II	Paper: IV (Parts)	12
SNM	Unit: 06	Unit: 01 & 05	Unit: 03 (Parts)	Unit: 01,06	Paper: IV/I	Paper: 11/1	Paper: V/1 & VIII/II	Paper: NIL	12
HH	Unit: 05	Unit:	Unit: NIL	Unit: 04,05	Paper: III/II	Paper: III/II	Paper: V1/II & VII/II	Paper. NIL	12

 The distributions of Courses (as per new CBCS, 2018-19) and Syllabus (as per old K.U. Hons. and General) are as follows:

- Teachers will set Question Papers, as instructed by H.O.D., (for Departmental / Internal Examinations) respectively for the Courses/ Papers/ Units they taught.
- 3. The existing Departmental Time Table for the academic secession 2018-19, which had been in operation since 02/07/2018, has duly been reset in order to incorporate the Classes of the newly appointed *Guest Teachers*' (Three in number). The *Revised Time Table*' will be effective on and from 09/10/2018. The H.O.D. is requested to take proper steps in this regard.

Notion

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Agorda:

(1) Distribution of couples (non a Good) and more toolate. (2) botting and commining of quation hereas and another couples approximate.

Agrav stort finat of the Department The net of Part of

Srikara Mondol/ 22.11.2013

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Samiul Mondal 22.11.2018

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Dapadmontal Maching.

First after the

Maating No. 11 Bate of Madring: 29-112018 Venue of Madring: Confederate Ram.

4

Teachape papeort: (1) Sanor suboti . 29-55-58. (2) Hape jul Halsona 29.11.18 (3) Samial Mondal 29.11.18 (4) Subladip Blannik 20/11/18

HALLE LE AND DE AND THE PARTY OF

After much discussion, it is resolved that:

Teachers	First	Year: Cl	Secon K 201	Second Year, KU: 2018-19		Third Year, KU: 2018-19			
	CC3	CC4	GE	CC	Hons,	Gen.	Hons.	Gen.	
AÐ	Unit: 01 & 05 (Parts)	Unit: 01 & 06 (Parts)	Unit: 01 & 03	Unit: NIL	Paper: IV/II	Paper: NIL	Paper: VII/I	Paper: NIL	16
SB	Unit: Nil	Unit: 02 & 05	Unit: 02 (Parts)	Unit; NIL	Paper; III/I	Paper: H/H	Paper: VI/I & VIII/I	Paper: (Parts)	12
SLM	Unit: Nil	Unit: 03, 04 & 06 (Parts)	Unit: 02 (Parts)	Unit: 03 & 04.	Paper: 111/1 & 111/11	Paper: III/1	Paper: V/II	Paper: tV (Parts)	12
SNM	Unit: 03 & 04.	Unit: Nil	Unit: 04 (Parts)	Unit: 06 & 07	Paper: IV/I	Paper: II/I	Paper: V/I & VIII/II	Paper: NIL	12
HH	Unit: 02 & 05 (Parts)	Unit: Nil	Unit: 04 (Parts)	Unit: 01, 02 & 05	Paper: III/II	Paper; III/II	Paper; VI/II & VII/II	Paper: NIL	12

 The distributions of Courses (as per new CBCS, 2018-19; CC3 & CC4) and Syllabus (as per old K.U. Hons, and General) are as follows:

 Teachers will set Question Papers, as instructed by H.O.D., (for Departmental / Internal Examinations) respectively for the Courses/ Papers/ Units they taught.

Teachers are requested to examine and submit the examined IATs Answer Scripts within 10 days from the date of IAT held.

📽 03481-230770 🖂 dumkalcollege@gmail.com



Ref:

Dumkal College, Basantapur

Dumkal * Murshidabad

Date: 12/04/2019

Notice

A departmental meeting will be held on 02/05/2019 at 2.30pm in the Conference Room to discuss the agenda given below.

All teachers concerned are requested to be present in the said meeting.

Agenda:

1/ To finalize the topic, date, and the name of the 'Guest Speaker' of this Academic Session's (2018-19) Departmental Seminar.

2/ To chalk out the approximate expenditure for the said Seminar.

3/ To distribute work responsibilities among the faculties for organizing and conducting of the same.

4/ To fix the date of Second Internal Tests for CC3, CC4, GE and CC (Gen) students and distribution of setting of question papers.
5/ Miscellaneous.

Jana slint

(Arnav Debnath, HOD, Political Science)

Head of the Department Dept of Political Science Dumks' College, Murshitshad

dependent Marting

Marting No.: 12. Data of Marting: 02-05-2019 Vanue of Marting: Conference Poom.

Members poesent:

1. Lanov abroth 02-05:19 2. Samicel Mondal 02-05-2019 2. Subhadip Bhounit 02/05/210

After much discussion resolved that:

- As there is no clear permission found from the authority as to organizing the "Departmental Seminar" (2018-2019), the date of the seminar is postponed until of due permission received.
- The 2nd Internal Tests for CC3, CC4, GE AND CC(GEN) students will be held on 13-05-2019.
- The HOD will take 'Special Classes' of POL-GE-T-1 from 20-05-2019 to 22-05-2019, 12:30- 02:30pm every day on the request of the students.



DUMKAL COLLEGE

BASANTAPUE P.O- Basantapur, P.S- Dumkal, Dist. - Murshidabad, West Bengal, Pin- 742406 ESTD 1999 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (lb) of UGC Act)

Date: 02-07-2019

9153549620

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NOTICE

A departmental meeting will be held on 11-07-2019 at 01.30pm in the conference room to discuss the agenda given below.

All concerned are requested to be present in the said meeting.

Agenda:

- 1. Distribution of courses both CBCS and Old pattern.
- Setting of question papers and fixing of dates of Internal Tests (CC 1, CC 2, CC 5, CC 6, CC7 and GE 1st and 3rd Semester).
- 3. Discussion about departmental seminar.
- 4. Preparation of departmental Time Table.
- 5. Miscellaneous.

Political Science

Head of the Department Dept of Political Science Dumkal College, Murshidabad

Depose Amental Mooting

Mading No: 13. Dafe of Macting: 11-07-2019. Venue of Macting: Conference Room

Members paareaf.

1 Senar sobroth 11-07-19. 2. Subhadip Blounik 11/07/2010 3 Samial Mondal 11-07-2019

After much discussion resolved that:

1. The distribution of courses (as per new CBCS 2018-2019) and old syllabus (UK) are as follows:

Teachers	CCI	CC2	GE	PCC	CC5	CC6	CC7	SEC 1A	HONS	Number of Classes
AD	Unit 1 & 2	Unit 3	Unitl & 2	Nill	Unit 1, 2	Unit 1, 2	Unit 1	Nill	7 Paper	16
SB	Unit 3	Unit 6	Unit 3 (Part)	Nill	Unit 3	Unit 3,4	Unit 4	Unit 1,2	6 Paper	12
SLM	Unit 4	Unit 2	Nill	Unit 2. 3 & 4	Unit 6	Unit 5 & 6	Unit 5	Unit 3, 4 & 5	Nill	12
SNM	Unit 6	Unit 1 & 5	Unit 3(Parts)	Unit 1 & 6	Unit 5,	Unit 7	Unit 2	Nill	8 th Paper	12
нн	Unit 5	Unit 4	Nill	Unit 4 & 5	Unit 4	Unit 8 & 9	Unit 3	Nill	5 th Paper	12

- Teachers will set question papers as per the instructions of the HOD for internal tests.
 It is also resolved that the Internal Tests for 1st and 3rd semesters will tentatively be taken in the months of September and December of this year respectively.
- The departmental seminar which was postponed will be held in the month of December as the permission is now granted by the authority.
- After much discussion it is decided that the topic of the coming Dept. Seminar will be 'Framing International Relations: A brief outline' and the guest speaker will be Dr Subhajit Ghosh, Assistant Professor of KN College.
- The HOD is requested to prepare a 'Departmental Time Table' in keeping with the 'Master Time Table' of the College before the commencement of the classes.
- Teachers are requested to examine and submit "Answer scripts" of Internal Tests within 15 days from the date of examination held.
- The answer scripts of Internal Tests shall be given to the students after tabulation as there is lack of space for preservation of the same.

Appartmental Mosting

Marting No. 14 Dapa of Meeting: 18-01-2020. Venue of Marting: Room 202.

Members present. 1. Ange Schort 18-01-20. 2. Amir Scharl 18/11/20 3. Subladie Branik 18/01/2020 4. Samint Mondal.

Date: 18-01-2020

This is a flash meeting as the Teachers have sudden opportunity to be together in person in the College today. But as no detailed discussion is possible due to Covid -19 protocol today, it is concurred that the teaching-learning activities such as Teaching, Question Setting (Internal), Evaluation of Answer Scripts (Internal and University) and Submission along with other regular activities will be done through online mode until further notification on the part of Government or College.

It is also resolved that a record the online meetings through Google Meet or Conference Call are to be kept for future use as far as possible.

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Date: 08-02-203

NOTICE

This is for all concerned that a 'Departmental Meeting' will be held on 15-02-2022 in the Conference Room at 2.30 pm to discuss the following agenda. All concerned are requested to take note of it.

Agenda:

- 1. Distribution of curriculum;
- 2. Preparation of Dept. Time Table:
- 3. Submission of KU 1st Semester Examination Answer Scripts;
- 4. Internal Test;
- 5. Miscellaneous.

rail Abnat

(H.O.D., Political Science)

Head of the Department Dept of Political Science Dumkal College, Myrshidapad

departmental Mosting

No. of Maeting: 15. Dafe of Maeting: 15-02-2022. Venue of Meeting: Conference from.

Members passent.

1. Lango sobroth

2. Subhadip Bhamif

3. Amir Schall 1512/2022

4. Samin Mondal.

After discussion resolved that:

н-сс-з	H- CC-4	H- GE-2	H- CC-8	H-CC-9	H- CC- 10	SEC- 2	H- CC- 13	H- CC- 14	DSE- 3-B
AD - 1,2,3 Units	SB- 1, 2,3 Units	AD - 1,2 Units	AD- 2,3,5 Umits	SM- 1.4.5Units	AS- 1.2.3 Units	AD-1 Unit	AD - 1,5, 6 Units	SM- 1,2 Units	AS - 1,2, Units
SM- 4,5Units	AS- 4,5,6 Unit	SM – 3Unit	SB - 1,4, 5 Units	AS- 2,3Units	SB-5 Unit	SB - 3,4 Unit	SB – 2,3,4 Units	AS- 3.5 Units	SM - 3 unit
					SM-4 unit	AS - 5 Unit		AD - 4 Unit	SB - 4 Unit
					AD - 6 unit	SM - 6 Unit			AD - 5 Unit

1. Curriculum are distributed for February-June (2022) CBCS students as follows -

- The 'Departmental Time Table' is prepared in keeping with the 'Master Time Table' of the College.
- The Answer Scripts of 1st Semester KU Examination will be evaluated and tabulated as per the chart given below –

Name of the Teachers	Course
AD	CC1
SB	Program
SM	CC2
AS	GE

- 4. The 3rd Semester Internal Tests (CC and GE) will tentatively be taken by the last week of March. All teachers will submit Question Papers to SM. The Answer scripts should be examined and get tabulated within fifteen days after the Tests held.
- 5. It is also resolved the 'Seminar Library' of our Department will be reopened for the use of the students from the first week of April, 2022. Subhadip Bhowmick will be in-charge of this same. Students can borrow and return books as per their requirements only on Thursday of every week. A separate Log Book will be maintained for this purpose.

ALL CONTRACTOR

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DUMKAL COLLEGE

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Dute: 14-07-2022

NOTICE

This is for all concerned that a 'Departmental Meeting' will be held on 22-07-2022 in the Conference

Room at 1.30 pm to discuss the following agenda.

All concerned are requested to take some of it.

Agendati

- 1. Distribution of curriculum;
- 2. Preparation of Dept. Time Table;
- 3. 57 Semester Marks uploading:
- 4. Internal Test;
- 5. Departmental Seminar;
- 6. Miscellaneosa.

Sand Shot

(ILO.D., Political Science)

Head of the Department Dept of Political Science Dumkal College **___bitchest

Spaldmontal Monting

No. of Marting: 16. Date of Marting: 22-7-2022. Venue of Marting: Conference Ram

Members present:

1. Segnal Sobrok 2. Suthadip Blounik enfortune 3. Amir Schail 2210712022 4. Sami W Mondal After discussion resolved that:

1/ Curricolum are distributed for July-December (2022) CBCS students as follows -

CC-1	CC-2	GE	CC-	CC- 6	CC-	GE	CC- 11	CC- 12	DSETB	DSE2B
AD - 1,2,3 Units	SM - 1.2.3 Units	SB - 1,2 Units	AD	SM	AS	SB	AD	SM	SB	AS
AS - 4,5,6 Units	SB - 4,5,6 Units	SM - 3,4 Units								
		AS - 5.6 Units								

2/ The 'Departmental Time Table' is prepared in keeping with the 'Master Time Table' of the College. As the number of days increased from three to four for the SACTs, SB, SM and AS are requested to add another day of duty as per their convenience in the new Time Table.

4/ The 1st, 3rd and 5th Semesters⁺ Internal Tests (CC and GE, DSE) will tentatively be taken by the last week of March. All teachers will submit Question Papers to SM. The Answer scripts should be examined and get tabulated within fifteen days after the Tests held.

5/ Departmental Seminars will tentatively be organized in the months of August and December this year.

6/ An 'Extension program' will tentatively be organized in the month of September. The theme, location, and course of action of the same will be scheduled later consulting with the IQAC Coordinator.

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Date: 02-01-2023

NOTICE

This is for all concerned that a 'Departmental Meeting' will be held on 10-01-2023 in the Conference Room at 2.30 pm to discuss the following agenda.

All concerned are requested to take note of it.

Agenda:

- 1. Distribution of curriculum;
- 2. Preparation of Dept. Time Table;
- 3. Internal Tests
- 4. Departmental preparation for next NAAC visit;
- 5. Miscellaneous.

Augar Dobrate

(H.O.D., Political Science) Head of the Department Dept. of Political Science Dumkal College, Murshidabad

Reparfmontal Mosting.

No. of Maeting: 17 Date of Meeting: 10-01-2023. Venue of Meeting: Conference Room.

Members proverf: 1 Sonal about 2. Samerel Mondal. 3. Situdip Bramik Holfrezz 4. Amir Schael 1010112023

After discussion resolved that:

1/ Curriculum are distributed for January-June (2023) CBCS students as follows -

2 ^{0d}	Semest	er		4 th Seme	6 th Semester				
H-CC-3	H- CC-4	H- GE-2	H- CC-8	H-CC-9	H- CC- 10	SEC- 2	H- CC- 13	H- CC- 14	DSE- 3-B
AD - 1,2,3 Units	SB- 1, 2,3 Units	AD – I,2 Units	AD- 2,3,5 Umits	SM- 1,4,5Units	AS- 1,2,3 Units	AD-1 Unit	AD - 1.5, 6 Units	SM- 1,2 Units	AS - 1,2, Units
SM- 4,5Units	AS- 4,5,6 Unit	SM – 3Unit	SB – 1,4, 5 Units	AS- 2,3Units	SB-5 Unit	SB – 3,4 Unit	SB - 2,3,4 Units	AS- 3.5 Units	SM – 3 unit
					SM-4 unit	AS - 5 Unit		AD - 4 Unit	SB - 4 Unit
					AD - 6 unit	SM - 6 Unit			AD - 5 Unit

2/ The 'Departmental Time Table' is prepared in keeping with the 'Master Time Table' of the College.

3/ The 6th Semester Internal Tests (CC, DSE and Dissertation) will tentatively be taken by the month of May. All teachers will submit Question Papers to SM. The Answer scripts should be examined and get tabulated within fifteen days after the Tests held.

4/ Teachers are requested to cooperate with the H.O.D. in preparing documents for the next NAAC.

6/ It is resolved unanimously that two 'Extension programs' will tentatively be organized in this academic session as per convenience. The topics of campaigns and courses of action of the will be scheduled later consulting with the IQAC.

7/ A departmental Seminar on the World Environment Day will be organized along with the ENVS Department of our College jointly.

7/ All concerned teachers are requested to give lists of new books to the H.O.D. for submitting to the Librarian for purchase.

 $8/6^{6}$ Semester Dissertation Paper Viva will be taken after the completion of the KU Final Examination.



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Date: 08-07-2023

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NOTICE

This is for all concerned that a 'Departmental Meeting' will be held on 17-07-2023 in the Conference Room at 1.30 pm to discuss the following agenda. All concerned are requested to take note of it.

Agenda:

- I. Distribution of curriculum;
- 2. Preparation of Dept. Time Table;
- 3. Internal Tests
- 4. Preparation of Question Bank for CBCS students
- 5. Organizing Departmental Seminars:
- 6. Miscellaneous.

Agnar Debroth

(H.O.D., Political Science) peqepitysing 'asalio() terming asuarce (control for ada) asuarce (control for ada) asuarce (control for a ada)

Departmental Meeting

Meeting Number: 18. Date of Meeting: 17-07-23. Vanue of Meeting: Conference from

Members Prescut :-D Subhadip Blank @ Amir Sohard 1710712023 @ Samired Mondal.

After discussion resolved that:

1/ Curriculum are distributed for July-December (2022) CBCS and NEP students as follows -

1" Semester (NEP)			3 rd Semester				5 th Semester				
MT-1	MI- T-	SEC- P-1	CC- 5	CC- 6	CC- 7	GE	СС- 11	CC- 12	DSE- 1B	DSE- 2B	
AD - 1,2,3,4 Units	SM - 1,2 Units	SB – 1 Units	AD	SM	SB	AD -1, 3 Units	AD	SM	SB	AD – 1,6 Units	
SB-5 Unit	SB 4,5 Units	SM – 2 Units				SB – 2.5 Units				SB – 2,3 Units	
SNM- 6 Unit	AD- 3,6 Units	AD - 3,4 Units				SM -4, 6 Units				SM – 4,5 Units	

2/ The 'Departmental Time Table' is prepared in keeping with the 'Master Time Table' of the College.

3) The 1st, 3^{nt} and 5th Semesters' Internal Tests (CC and GE, DSE) will tentatively be taken in the months between March and April. All teachers will submit Question Papers to SM. The Answer scripts should be examined and get tabulated within fifteen days after the Tests held.

4/ A Departmental Seminars will tentatively be organized in the month of December.

5/ Teachers are requested to cooperate with the H.O.D. in preparing documents for the

NAAC, 2024. The progress of NAAC- related works will be evaluated from time to Time.
DUMKAL COLLEGE DEPARTMENT OF PHILOSOPHY DISTRIBUTION OF SYLLABUS OF PHILOSOPHY HONOURS AND GENERAL SESSION: 2018-2019 (w.e.f: July)

Name of Teacher	Semester/ Year	Course Details	Content	No. of Lecture
SAMIUL ISLAM		Course Code:	General Introduction	41
		PHIL-H-CC-T-01.	Nyāya — Vaišeşika	
SABITA KHAN	0		Cārvāka	36
		Course Title:	Jainism	
OESMIN BANU	1 st Sem	Outline of Indian Philosophy – 1	Buddhism	15
SAMIUL ISLAM	Hons	Course Code: PHIL-H-CC-T-02	Distinctive Features of Western Philosophy.	28
	States and		Plato	1
SABITA KHAN		Course Title:	Aristotle	31
		Outline of	Descartes	
OESMIN BANU		Western Philosophy – 1	Spinoza	35
	-		Leibniz	
SAMIUL ISLAM		Course Code: PHIL-H-GE-T-01	General Introduction	54
			Cārvāka	
			Jainism	
		Course Title:	ourse Title: Buddhism	
OESMIN BANU		Indian Philosophy	Nyāya	41
			Vaiśeşika	
			Advaita Metaphysics	
SAMIUL ISLAM		Course Code:	General Introduction	54
	50-00 Million	PHIL-G-CC-T-01	Cárváka	6456
	1 st Sem		Jainism	
	Programme /	Course Title:	Buddhism	
OESMIN BANU	General	Indian	Nyāya	41
		Philosophy	Vaišeșika	
			Advaita Metaphysics	1 million 1
OESMIN BANU		Paper-III	Psychology	1000
		(Group-A:	Methods of Psychology	200
		Psychology)	Sensation and Perception	
	Sur		Psychological Processes	101-0-1
		2	Learning	50
and a strategy of the	Part-II	Att	Attention	

- 5

Memory Philosophy Consciousness (Hons) Interactionism Intelligence Nature & Scope of i) Social Philosophy, ii) Political Philosophy Basic concepts Society SABITA KHAN 1 50 Paper-III Community, Association, (Group-B: Institutions, Family Social relations and Theories about the Political between Philosophy) Individual and Society Social Change Political Ideals Gandhi's Concepts SAMIUL ISLAM M.Copi & Karl Cohen: Introduction 100 Paper-IV to Logic (11th Edition); Chapters: 5 (Western Logic) -14.4**DESMIN BANU** Part-II Paper - II Indian Ethics 25 Philosophy Group-A: Ethics Western Ethics 25 (General) (Indian 8 Western) 1 SABITA KHAN Sensation 50 Perception Paper-II Memory Group-B: Consciousness Psychology Learning Intelligence SAMIUL ISLAM Paper - III Indian and Western Logic 100 Logic Paper - V Tarkasamgrahah with Dipika 100

Indian Logic & - Annambhatta **OESMIN BANU** Epistemology From Sarvavyavahāra heturguņah buddhirjñānam to smrtirapi dvividha yathärtha ayathärthaśceti Paper - VI John Hospers : An Introduction to 100 Philosophical Philosophical Analysis SAMIUL ISLAM Analysis (First Indian Edition) Chapters -1,2,3,4,5,6,8 SABITA KHAN Part-III Paper - VII Eastern And Western 100 Ethics

6

SAMIUL ISLAM	Philosophy (Hons)	Paper-VIII (Group -A: Philosophy of Religion)	 Nature and Scope of Philosophy of Religion Distinction between Religion & Comparative Religion Origin of Religion: Anthropological Theories (Mānā, Totem & Taboo) Religion, Dharma and Dhamma Grounds of Belief in God - Cosmological, Teleological and Ontological arguments Grounds of Disbelief in God - Sociological Theory and Freudian Theory, Cārvāka, Buddha and Jaina Views The Problem of Evil 	f 50
OESMIN BANU		Paper-VIII (Group -B: Vedānta)	Vedāntasāra	50
SAMIUL ISLAM	Part-III	Philosophy of	Group: A (Philosophy of Religion)	50
OESMIN BANU	Philosophy (General)	Religion and Social and Political Philosophy	Group: B (Social and Political Philosophy)	50

Stelam 3.7. 2018

Head of the Department Dept of Philosophy Dumkal College, Murshidabad

DUMKAL COLLEGE DEPARTMENT OF PHILOSOPHY DISTRIBUTION OF SYLLABUS OF PHILOSOPHY HONOURS AND GENERAL SESSION: 2018-2019 (w.e.f: Sept. 2018)

Name of Teacher	Semester/ Year	Course Details	Content	No. of Lecture
ABDUL ALIM		Course Code:	General Introduction	41
SEIKH		PHIL-H-CC-T-	Nyāya – Vaišesika	
MIR ALAM		01.	Cārvāka	36
	1	Course Title:	Jainism	
SOMASHREE GHOSH CHOWDHURY	1 st Sem Hons	Indian Philosophy – 1	Buddhism	15
ABDUL ALIM SEIKH		Course Code: PHIL-H-CC-T-	Distinctive Features of Western Philosophy.	28
		02	Plato	
MIR ALAM		Course Title: Outline of Western Philosophy – 1	Aristotle	32
KHAN			Descartes	
SOMASHREE			Spinoza	35
GHOSH CHOWDHURY			Leibniz	
ABDUL ALIM	1	Course Code:	General Introduction	54
SEIKH		PHIL-H-GE-T-	Cārvāka	
		01	Jainism	
			Buddhism	
SOMASHREE		Course Title:	Nyāya	41
GHOSH		Indian	Vaišeşika	44
HOWDHURY		Philosophy	Advaita Metaphysics	
ABDOLALIM		Course Code:	General Introduction	54
SEIKH	101222-001	PHIL-G-CC-T-	Cārvāka	1. T. T.
	1 st Sem	01	Jainism	
SOMASHDEE	Programme /		Buddhism	
GHOSH	General	Course Title:	Nyāya	41
HOWDHURY		Philocophy	Vaišesika	
		Philosophy	Advaita Metaphysics	
	and the second	Paner III	Psychology	
		raper-III	Methods of Psychology	-
		S	Sensation and Perception	

MIR ALAM KHAN		(Group-A:	Psychological Processes		
	Part-II	(sychology)	Attention	50	
	Philosophy	10	Attention		
	(Hons)		Memory		
	(110113)		Consciousness		
			Interactionism		
	-		Intelligence		
			Nature & Scope of i) Social Philosophy, ii) Political Philosophy		
MIR ALAM		Paper-III (Group-B:	Paper-III Basic concepts : Society , Community , Association, (Group-B: Institutions, Family		
KHAN		Social and Political Philosophy)	Theories about the relations between Individual and Society		
	and the second second		Social Change		
19 C			Political Ideals		
			Gandhi's Concepts		
ABDUL ALIM SEIKH		Paper-IV (Western Logic)	M.Copi & Karl Cohen: Introduction to Logic (11th Edition); Chapters: 5 – 14.4	100	
RABIUL HAQUE	Part-II	Paper – II	Indian Ethics	25	
	Philosophy (General)	Group: Ethics (Indian & Western)	Western Ethics	25	
MIRALAM			Sensation	50	
KHAN			Perception	- 50	
		Paper – II	Memory		
		Group-B:	Consciousness		
		Psychology	Learning		
		1000 C 100 C	Intelligence		
RABIUL HAQUE		Paper – III Logic	Indian and Western Logic	100	
ABDUL ALIM SEIKH		Paper – V Indian Logic & Epistemology	Tarkasamgrahah with Dipikā - Annambhatta From Sarvavyavahāra heturguņah buddhirjňānam to smrtirapi dvividha yathārtha ayathārthaśceti	100	
MIR ALAM KHAN		Paper – VI	John Hospers : An Introduction to Philosophical Analysis	100	

		Philosophica Analysis	I (First Indian Edition) Chapters -1,2,3,4,5,6,8	
MIR ALAM KHAN	Part-III Philosophy (Hons)	Paper - VII (Ethics)	Eastern and Western	100
RABIUL HAQUE		Paper-VIII (Group -A: Philosophy of Religion)	 Nature and Scope of Philosophy of Religion, Distinction between Religion & Comparative Religion Origin of Religion: Anthropological Theories (Mānā, Totem & Taboo) Religion, Dharma and Dhamma Grounds of Belief in God - Cosmological, Teleological and Ontological arguments Grounds of Disbelief in God - Sociological Theory and Freudian Theory, Cārvāka, Buddha and Jaina Views The Problem of Evil 	50
MIR ALAM KHAN		Paper-VIII (Group -B: Vedānta)	Vedāntasāra	50
SOMASHREE GHOSH CHOWDHURY	Part-III Philosophy (General)	Paper-IV Philosophy of Religion and	Group: A (Philosophy of Religion)	50
ABDUL ALIM SEIKH	\$ \$.	Social and Political Philosophy	Group: B (Social and Political Philosophy)	50

Head of the Department Dept of Philosophy Dumkel College, Murshidabad

Name of Teacher	Semester	Course Details	Content	No. of
ABDUL ALIM	11	Course Code:	Sāmkhya	42
SEIKH		PHIL-H-CC-T-	Yoga	1
MIR ALAM KHAN	Ц	03	Pūrva Mīmāmsā	18
SOMASHREE	11		Advaita Vedānta	33
GHOSH CHOWDHURY		Course Title: Outline of Indian Philosophy – 2	Viśistādvaita Vedānta	
MIR ALAM KHAN		Course Code:	Locke	65
	11	PHIL-H-CC-T-	Berkeley	
		04	Hume	
SOMASHREE GHOSH CHOWDHURY	11	Course Title: Outline of Western Philosophy – 2	Kant	25
ABDUL ALIM SEIKH	Ш	Course Code: PHIL-H-GE-T-	General Introduction to Symbolic Logic	75
SOMASHREE GHOSH CHOWDHURY	н	02 Course Title: Western Logic	Inductive Logic	21
ABDUL ALIM SEIKH	н	Course Code: PHIL-G-CC-T-	General Introduction to Symbolic Logic	75
SOMASHREE GHOSH CHOWDHURY	11	02 Course Title: Western Logic	Inductive Logic	21

Head of the Department Billikal College, Murshidabad

Name of Teacher	Semeste r	Course Details	Content	No. of Lecture
SOMASHREE GHOSH CHOWDHUR Y	ш	Course Code: PHIL-H-CC-T-05 Course Title: Indian Ethics	 Introduction Dharma Puruşārtha Buddhist Ethics Jaina Ethics Yoga Ethics 	96
MIR ALAM KHAN	ш	Course Code: PHIL-H-CC-T-06 Course Title: Western Ethics	 Nature and scope of Ethics Teleological Ethics Deontological Ethics Practical Ethics Virtue Ethics 	96
ABDUL ALIM SEIKH	ш	Course Code: PHIL-H-CC-T-07 Course Title: Indian Logic	Tarkasamgraha with Dīpikā — Annambhatta. Sarvavyavahara heturgunah buddhirjnanam to Nigrahasthanantaramiti nabina. (Upto Hetvabhāsa)	96
RABIUL HAQUE	ш	Course Code: PHIL-H-SEC-T-1 Course Title: Logical Rules and Fallacies (Indian)	 Definition and classification of anumāna Aid to Anumāna: (a) tarka (b) avayava (c) drstānta (d) siddhānta Nature of Hetu and Hetvābhāsa 	64
ABDUL ALIM SEIKH	ш	Course Code: PHIL-H-GE-T-03	 General Introduction Cārvāka Jainism Buddhism 	52
SOMASHREE GHOSH CHOWDHUR Y		Course Title: Indian Philosophy	 Nyāya Vaišeşika Advaita Metaphysics 	41

MIR ALAM KHAN	ш	Course Code: PHIL-G-CC-T-03 Course Title: History of western	1. Plato 2. Descartes 3. Spinoza 4. Leibniz	48
SOMASHREE GHOSH CHOWDHUR Y		Philosophy	5. Locke 6. Berkeley 7. Hume 8. Kant	48
RABIUL HAQUE	2111	Course Code: PHIL-G-SEC-T-1 Course Title: Logical Rules and Fallacies (Indian)	 Definition and classification of anumăna The Nyāya model (chala, jāti, nigrahasthāna, vāda, jalpa, vitaņdā) The Buddhist model (prasanga) Aid to Anumăna: (a) tarka (b) avayava (c) drşţānta (d) siddhānta Nature of Hetu and Hetvābhāsa 	64

Head of the Department Dept. of Philosophy Dumkal College, Murshidabad l3

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Hetväbhäsa



Name of Teacher	Semester	Course Details	Content	No. of Lecture
ABDUL ALIM SEIKH RABIUL HAQUE	IV	Course Code: PHIL-H-CC-T-08 Course Title: Western Logic –	 Introduction Deductive Logic Inductive Logic 	55
MIR ALAM KHAN	IV	1 Course Code: PHIL-H-CC-T-09 Course Title: Psychology	 Nature and Scope of Psychology Methods of Psychology Psychological Process Unconscious and Dream 	96
SOMASHREE GHOSH CHOWDHUR Y	IV	Course Code: PHIL-H-CC-T-10 Course Title: Philosophy of Religion	 Nature and Scope of Philosophy of Religion Religion: Origin and Development of Religion Basic Tenets of some Religion Argument for the Existence of God Arguments against the Existence of God. 	96
RABIUL HAQUE	IV	Course Code: PHIL-H-SEC-T-2	R.Jeffry: Formal Logic (1st Edition) It's scope and Limits, Chapter-4	28
ABDUL ALIM SEIKH		Course Title: Logical Rules and Fallacies (Western)	P. Suppes: Introduction to Logic (Indian edition) Chapter-9, Section –9.1 to 9.8	36
ABDUL ALIM SEIKH	IV	Course Code: PHIL-H-GE-T-04	1. Introduction 2. Deductive Logic	71
SOMASHREE GHOSH CHOWDHUR Y	IV	Course Title: Western Logic	3. Inductive Logic	25

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MIR ALAM KHAN	IV	Course Code: PHIL-G-CC-T-04 Course Title: Social and Political Philosophy.	 Nature and Scope of Social Philosophy and Individual, society & Community. Social Instituition: Association, instituition, Family, Marriage, Education & Religion. Political Ideology: Democracy, Socialism & Sarvodaya. Methods of political Action: Terrorism & Satvagraby 	96
HAQUE	IV	Course Code: PHIL-G-SEC-T-2	 R.Jeffry: Formal Logic (1st Edition) It's scope and Limits, Chapter-4 	28
ABDUL ALIM SEIKH		Course Title: Logical Rules and Fallacies (Western)	 P. Suppes: Introduction to Logic (Indian edition) Chapter-9, Section –9.1 to 9.8 	36

Head of the Department Dept. of Philosophy Dumkal College, Murshidabad

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Name of Teacher	Semester	Course Details	Content	No. of Lecture
MIR ALAM KHAN	v	Course Code: PHIL-H-CC-T-11 Course Title: Social and Political Philosophy.	 Nature and Scope of Social Philosophy and Political Philosophy Theories about the relations between individuals and society. Political Ideology. Social change Concepts of Gandhi 	96
ABDUL ALIM SEIKH	v	Course Code: PHIL-H-CC-T-12 Course Title: Western Logic – II	 Introduction to Logic – P. Suppes Chapter – 9 & 10 H.W.B. Joseph: An Introduction to Logic Chapter-II, IV & Chapter- V 	96
SOMASHREE GHOSH CHOWDHURY	v	Course Code: PHIL-H-DSE-T-1 Course Title: Vedāntasāra	Vedāntasāra (Text) (Upto viksepašakti)	96
RABIUL HAQUE	V	Course Code: PHIL-H-DSE-T-2 Course Title: An Enquiry Concerning Human Understanding	An Enquiry Concerning Human Understanding (Text) (Chapter 1 to 12)	96
SOMASHREE GHOSH CHOWDHURY	v	Course Code: PHIL-G-DSE-T-1A	 Vedic System of Values Concept of Man and Humanity Purusartha-s Nature of svadharma and sādhāraņa dharma Varnāśrama dharma 	96

		Course Title: Vedic Value System	 6. Three ways to attain Mokşa 7. Niskāma Karma 	
RABIUL HAQUE	V	Course Code: PHIL-G-SEC-T-03 Course Title: Philosophy in Practice.	 Characteristic and nature of inquiry in Philosophy and Darshana. Outline of types of inquiry in Philosophy and Darshana. World views and corresponding paths leading to perfection Plato's, Gita & Ten commandments. 	64
MIR ALAM KHAN	v	Course Code: PHIL-G-GE-T-1 Course Title: Applied Ethics	 An Introduction to Moral Philosophy and Applied Ethics. Value of Human Life Environmental Ethics Professional Ethics and Public Policy Discrimination 	96

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Name of Teacher	Semester	Course Details	Content	No. of
ABDUL ALIM SEIKH	VI	Course Code: PHIL-H-CC-T-13 Course Title: Western Epistemology	An Introduction to Philosophical Analysis – John Hospers. Chapter I, II,III & IV	96
RABIUL	VI	Course Code: PHIL-H-CC-T-14 Course Title: Western Metaphysics	An Introduction to Philosophical Analysis – John Hospers. Chapter- V,VI & VIII	96
SOMASHREE GHOSH CHOWDHURY	VI	Course Code: PHIL-H-DSE-T-3 Course Title: Practical Ethics	 An Introduction to Moral Philosophy and Applied Ethics. Value of Human Life Nature as Means & Ends Medical Ethics Discrimination: Gender, Caste & Class. 	96
MIR ALAM KHAN	VI	Course Code: PHIL-H-DSE-T-4 Course Title: Contemporary Indian Philosophy.	 Rabindranath Tagore- Surplus in Man, Education M.N. Roy - Radical Humanism Aurobindo- Evolution, Involution Vivekananda- Universal Religion, Practical Vedanta 	96

MIR ALAM KHAN	VI	Course Code: PHIL-G-DSE-T-1B Course Title: Contemporary Indian Philosophy	 Rabindranath Tagore- Surplus in Man, Education M.N. Roy – Radical Humanism Aurobindo- Evolution, Involution Vivekananda- Universal Religion, Practical Vedanta 	96
SOMASHREE GHOSH CHOWDHURY	VI	Course Code: PHIL-G-SEC-T-04 Course Title: Yoga Philosophy	1. The definition and essence of Yoga 2. Yoga in Jainism, Buddhism & Bhagavadgita 3. Patanjali's Astanga Yoga Marga.	64
ABDUL ALIM SEIKH	VI	Course Code: PHIL-G-GE -T-02 Course Title: INDUCTIVE LOGIC	 Introduction to Inductive Logic Kinds of Induction Postulates of Induction Hypothesis Mills method of experimental enguiry 	96

Head of the Department Dept of Philosophy Dumkal College, Murshidabad

LESSON PLAN

(SESSION: 2018-2019)

Name of Teacher: Sukalyan Biswas

SEMESTER	PAPER	CONTENT & TOTAL CLASSES	TOPIC WISE NUMBER OF CLASSES
1 st SEMESTER	SANS-H-GE-T-01	Basic Sanskrit 48	 Grammar and Composition Part-I26 Grammar and Composition Part-II20 Literature10
2 ND SEMESTER	SANS-H-GE-T-02	Classical Sanskrit Literature (Prose) 48	 Śukanāsopadeśa 20 Vis'rutacaritam upto 15th Para 16 Survey of Sanskrit Literature - Prose 12

SYLLABUS DISTRIBUTION & LESSON PLAN

Department: Sanskrit Session 2018-2019 B.A. (General) Part-II (2nd Paper)

DESCRIPTION	TOPIC	MARKS	CLASS TAKEN	NO OF
			BY	LECTURES
Unit-I	Abhijnanasakuntalam	50	S.B	50
Unit-II	Raghuvamsam(Canto I)	40	S.B	40
	Translation from Sanskrit into	10	S.B	10
	English or Bengali			
Total		100		100

Part-II (3rd Paper)

DESCRIPTION	TOPIC	MARKS	CLASS TAKEN BY	NO OF LECTURES
	History of Sanskrit	35	S.B	35
Unit-I	Vedic Portion)			
	Ramayana (Balakanda,	15	S.B	15
	Chapter I only)			
Unit-II	Isopanisad	25	S.B	25
	Manusamhita, Chapter	25	S.B	25
	VII,(Verses 1- 100 only)			
Total		100		100

LESSON PLAN

(SESSION: 2019-2020)

Name of Teacher: Sukalyan Biswas

SEMESTER	PAPER	CONTENT &	TOPIC WISE NUMBER OF
		TOTAL	CLASSES
		CLASSES	
1 st SEMESTER	SANS-H-GE-T-01	Classical Sanskrit Literature (Poetry) 48	 Raghuvaņšam: Canto-I (Verse: 1-25) 12 Kirātārjunīyam: Canto I (1-25 Verses) 12 Nītišatakam (1-20 Verses, 1st two Paddhatis)-M. R. Kale Edition 12 History of Sanskrit Poetry 12
3 RD SEMESTER	SANS-H-GE-T-01	Classical Sanskrit Literature (Poetry) 48	 Raghuvaņšam: Canto-I (Verse: 1-25) 12 Kirātārjunīyam: Canto I (1-25 Verses) 12 Nītišatakam (1-20 Verses, 1st two Paddhatis)-M. R. Kale Edition 12 History of Sanskrit Poetry 12

LESSON PLAN

(SESSION: 2020-2021)

Name of Teacher: Sukalyan Biswas

SEMESTER	PAPER	CONTENT &	TOPIC WISE NUMBER OF
		CLASSES	ULASSES
1 st SEMESTER	SANS-H-GE-T-01	Classical Sanskrit Literature (Poetry) 48	 Raghuvaņšam: Canto-I (Verse: 1-25) 12 Kirātārjunīyam: Canto I (1-25 Verses) 12 Nītišatakam (1-20 Verses, 1st two Paddhatis)-M. R. Kale Edition 12 History of Sanskrit Poetry 12
2 ND SEMESTER	SANS-H-GE-T-02	Classical Sanskrit Literature (Prose) 48	 Śukanāsopadeśa 20 Vis'rutacaritam upto 15th Para 16 Survey of Sanskrit Literature - Prose 12
4 TH SEMESTER	SANS-H-GE-T-02	Classical Sanskrit Literature (Prose) 48	 Śukanāsopadeśa 20 Vis'rutacaritam upto 15th Para 16 Survey of Sanskrit Literature - Prose 12

LESSON PLAN (SESSION : 2021-2022) Name of Teacher: Sukalyan Biswas

SEMESTER CONTENT & TOPIC WISE NUMBER OF PAPER TOTAL **CLASSES CLASSES** • Raghuvamśam: Canto-I (Verse: 1-25) ---- 12 • Kirātārjunīyam: Canto I **Classical Sanskrit** (1-25 Verses) ---- 12 **1ST SEMESTER** SANS-H-GE-T-01 Literature • *Nītiśatakam* (1-20 Verses, 1st two Paddhatis)-M. R. (Poetry) ---- 48 Kale Edition ----- 12 History of Sanskrit Poetry --- 12 Śukanāsopadeśa ---- 20 • • Vis'rutacaritam upto 15th **Classical Sanskrit** 2ND Para ---- 16 SANS-H-GE-T-02 Literature SEMESTER Survey of Sanskrit (Prose) ----- 48 • Literature – Prose-----12 • Raghuvamśam: Canto-I (Verse: 1-25) ---- 12 • Kirātārjunīyam: Canto I **Classical Sanskrit** 3RD (1-25 Verses) ---- 12 SANS-H-GE-T-01 Literature Nītiśatakam (1-20 Verses, • SEMESTER 1st two Paddhatis)-M. R. (Poetry) ---- 48 Kale Edition ----- 12 **History of Sanskrit Poetry** • ---- 12 Śukanāsopadeśa ---- 20 • Vis'rutacaritam upto 15th **Classical Sanskrit** • **∆**TH Para ---- 16 SANS-H-GE-T-02 Literature SEMESTER Survey of Sanskrit (Prose) ----- 48 • Literature – Prose ----- 12

LESSON PLAN

(SESSION: 2022-2023)

Name of Teacher: Sukalyan Biswas

SEMESTER	PAPER	CONTENT &	TOPIC WISE NUMBER OF
		TOTAL	CLASSES
		CLASSES	
1 st SEMESTER	SANS-H-GE-T-01	Classical Sanskrit Literature (Poetry) 48	 Raghuvaņšam: Canto-I (Verse: 1-25) 12 Kirātārjunīyam: Canto I (1-25 Verses) 12 Nītišatakam (1-20 Verses, 1st two Paddhatis)-M. R. Kale Edition 12 History of Sanskrit Poetry 12
3 RD SEMESTER	SANS-H-GE-T-01	Classical Sanskrit Literature (Poetry) 48	 Raghuvaņśam: Canto-I (Verse: 1-25) 12 Kirātārjunīyam: Canto I (1-25 Verses) 12 Nītiśatakam (1-20 Verses, 1st two Paddhatis)-M. R. Kale Edition 12 History of Sanskrit Poetry 12

DUMKAL COLLEGE

ECONOMICS (GENERAL) UG-CBCS STILLARSS IN THE UNITERSITY OF KALLENT

(ACADEMIC YEAR 2018-2019 ONWARDS)

Basantapur ; Dumkal; Murshidahad

Outrial College Contra Mary Station

B.A./ B.Sc.. ECONOMICS (GENERAL) SEMESTER-I Course: ECON—G-CC-T-01 Course title: Principles of Microeconomics - I Core Course; Credit-6; Full Marks-75

COURSE OBJECTIVES:

After completion of the course the learners will be able to: Learn the basic functioning of individual economic agents in a market economy.

COURSE CONTENT:

1. Introduction

 a. Problem of searcity and choice: scarcity, choice and opportunity cost; production possibility frontier; economic systems.

b. Demand and supply: law of demand, determinants of demand, shifts of demand versus movements along a demand curve, market demand, law of supply, determinants of supply, shifts of supply versus movements along a supply curve, market supply, market equilibrium.

c. Applications of demand and supply: price rationing, price floors, consumer surplus, producer surplus.

d. Elasticity: price elasticity of demand, calculating elasticity, determinants of price elasticity, other elasticities.

2. Consumer Theory

Budget constraint, concept of utility, diminishing marginal utility, Diamond-water paradox, income and substitution effects; consumer choice: indifference curves, derivation of demand curve from indifference curve and budget constraint.

3. Production and Costs

a. Production: behaviour of profit maximising firms, production process, production functions, law of variable proportions, choice of technology, isoquant and isocost lines, cost minimizing equilibrium condition.

b. Costs: costs in the short run, costs in the long run, revenue and profit maximizations, minimizing losses, short run industry supply curve, economics and diseconomies of scale, long run adjustments.

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4. Perfect Competition

Assumptions: theory of a firm under perfect competition, demand and revenue; equilibrium of the firm in the short run and long run; long run industry supply curve; increasing, decreasing and constant cost industries.

SUGGESTED READINGS:

1. Case, Karl E. & Ray C. Fair, Principles of Economics, Pearson Education, Inc., 8th edition, 2007.

- 2. Samuelson, P. & Nordhaus, Economics,
- 3. Lipsey and Chrystal: An Introduction to Positive Economics.

SEMESTER – II Course: ECON—G-CC-T-04 Course title: Principles of Macroeconomics - I Core Course; Credit-6; Full Marks-75

COURSE OBJECTIVES:

After the completion of the course the learner will be able to: Learn the basic variables of a market economy at the macro level. Learn the concepts like national income and money in modern market economy.

COURSE CONTENT:

1. Introduction

What is macroeconomics? Macroeconomic issues in an economy.

2. National Income Accounting

Concepts of GDP and National Income; measurement of national income and related aggregates; nominal and real income; limitations of the GDP concept.

3. Determination of GDP

Actual and potential GDP; aggregate expenditure; consumption function; investment function; equilibrium GDP; concepts of MPS, APS, MPC, APC; autonomous expenditure; Concept of multiplier.

Dumkal, Murshidaba

4. National Income Determination in an Open Economy with Government

Fiscal Policy: impact of changes in government expenditure and taxes; net exports function; net exports and equilibrium national income.

5. Money in a Modern Economy

Concept of money in a modern economy; monetary aggregates; demand for money; quantity theory of money; liquidity preference and rate of interest; money supply and credit creation; monetary policy.

SUGGESTED READINGS:

1. Case, Karl E. & Ray C. Fair, Principles of Economies, Pearson Education, Inc., 8th edition, 2007.

Sikdar, Soumyen, Principles of Macroeconomics, 2nd Edition, Oxford University Press, India
 Lipsey and Chrystal: An Introduction to Positive Economicstroduction to Positive Economic

reacher-in-Unarge Dumkal College Dumkal, Murshidabad

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TO STUDIE OF STUDIES IN	the second se	A state of the	P12 -
lst sem	Unit-1: Principles of Microeconomics	Problem of scarcity and choice: scarcity, choice and opportunity cost; production possibility fromuler; economic systems.	
		Demand and supply: law of demand, determinants of demand, shifts of demand versus movements along a demand.	05
		curve, market demand, law of supply, determinants of supply, shifts of supply versus movements elong a supply curve, market supply, market aquilibrium.	
		Consumer surplus-using demand curve to measure consumer surplus, producer surplus.	92
		Elasticity: price elasticity of demand, calculating elasticity, determinants of price elasticity, income elasticity, elasticity of supply and its determinants.	02. 1
1947年1月1日	Company of the second s		12.00
lst sem	Unit 2: Concumer Theory	Utility in Cardinal Approach- Utility and choice, Total Utility and Marginal Utility, Utility and choice-maximization, marginal utility, theory of demand reference;	07
		Ordinal utility: Indifference Curve, marginal rate of substitution and convexity of it budget constraint, income and substitution effects:	OR
	lst sem	Ist sem Unit-1: Principles of Microeconsonnics	Let sena Unit-1: Principles of Microeconomics scercity, choice and opportunity cost; production possibility fromier; economic systems. Demand and supply: law of demand, determinants of demand, determinants of demand, determinants of supply, determinants of supply, shifts of supply versus movements along a supply curve, market demand, law of supply, determinants of supply, curve, inarket supply, market. atmitter supply. rearket. atmitter supply. rearket. Consumer suplus-using demand curve to measure consumer surplus, producer surplus. Elasticity: price elasticity of determinants of price elasticity, determinants of price elasticity, determinants of price elasticity of supply and its determinants. List sem Unit 2: Consumer Utility and choice, Total Utility and Marginei Utility, utility and choice-mardinatation, marginal utility, theory of demand reference: Dirdinal utility: (notifiasence, Curve, marginal rate of substitution and convertive of its substitution and convertive of its budget constraint, income and substitution reflects

Dehasis Bandyopadhyay	1st sem	Unit 2: Consumer Theory	Derivation of demand curve from Indifference curve and budget constraint.	02
Amritendu Roy	lst sem	Unit 3: Production and Cost:	Behaviour of profit maximising firms, production process, production functions, law of variable proportions, choice of technology, isoquant and iso- cost lines, cost minimizing equilibrium condition.	10
			Costs: costs in the short run, costs in the long run, relation between short run and long run costs.	05
mritenda Roy	Ist som	Unit 4: Perfect Competition	Assumptions: theory of a firm under perfect competition, demand and revenue; marginal cost curve and supply decision of the firm, equilibrium of the firm in the short run and long run;	04
			long run industry supply curve: Increasing, decreasing and constant cost industries.	02

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Amritendu Roy	2 nd sem	Macro Economics	What is macroeconomics?	01
	1. Introduction Macroeconomic issues in an economy.		Macroeconomic Issues in an economy.	01
Debasis	2 ^{nt} sem	2. National	Concepts of GDP	01
Bandyopadhyay	one provinsion.	Accounting	National Income	01
			Measurement of national income and related aggregates;	02
			Nominal and real income;	01
			limitations of the GDP concept.	01
Amritenda Roy	2 nd sem	2. National Income Accounting	Measurement of national income and related aggregates;	01
Amritendu Roy	2 ^{ad} sem	3. Determination of GDP	Actual and potential GDP; aggregate expenditure;	02
			consumption function; investment function;	02
			Equilibrium GDP; concepts of MPS, APS, MPC, APC;	03

Teacher-in-Charge Teacher-in-College Dumikal, Murshidabad Dumikal, Murshidabad

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			Autonomous expenditure; Concept of multiplier.	02	
Amritendu Roy	2 nd som 4. Nat Incom Deterr	4. National Income Determination In an Open	Fiscal Policy: impact of changes in government expenditure and taxes;	02	
		Economy with Government	Net exports function; net exports and equilibrium national income.	02	
Amritendu Roy	2 nd sem	5. Money in a Modern Economy	Concept of money in a modern economy; monetary aggregates; demand for money; quantity theory of money; liquidity preference and rate of interest;	03	
			Money supply and credit creation; monetary policy.	03	

Den Charge Teacher-in-Charge Dumkal College Dumkal, Murshidabad

Distribution of' Syllabus for UG B.Com (Hons) Session-2018-2019 (w.c.f. 01.07.2018 to 31.12.2018)

SI. No.	Name of Teacher	Class	Name of the Subject	Details of the Subject
1.	Arup Ratan Misra	1 st Sem	Financial Accounting – 1 (UG BCOM-H-CC-T-01)	Basic Principles of preparing Final Accounts, Final Accounts of Profit Seeking Organisation, Final Accounts of Not-for-Profit Organisation, Accounting for special sales transaction (Consignment, Joint Venture, Accounting for sales on Approval)
2.	Debasis Bandyopadhyay	1 st Sem	Micro Economics (UG BCOM-H-CC-T-02) Principles of Management (UG BCOM-H-GE-T-01)	Demand and Supply, Consumer Behaviour, Perfect Competition, Imperfect Competition. Introduction, Evolution of Management Thoughts, Planning, Organising, Motivation.
3.	Basudev Sinha	1 st Sem	Principles of Management (UG BCOM-H-GE-T-01) Micro Economics	Leadership, Communication, Control, Co-ordination. Production and Cost
4.	Md. Hazarat Ali	1 st Sem	(UG BCOM-H-CC-T-02) Environmental Studies (UG BCOM-H-AECC-T-01) Financial Accounting – 1 (UG BCOM-H-CC-T-01)	Introduction of Accounting, Double entry book keeping system, Accounting from

Distribution of' Syllabus for UG B.Com (Hons)

Session-2018-2019 (w.c.f. 01.01.2019 to 30.06.2019)

SI.	Name of Teacher	Class	Name of the Subject	Details of the Subject
No.				
1.	Arup Ratan Misra	2 st Sem	Business	Logarithim, Laws of Indices, A.P.
			Mathematics and	Series, G.P. Series, Compound
			Statistics	Interest & Annuities, Functions,
			(UG BCOM-H-GE-T-02)	Limit, Continuity and
				Differentiation.
2.	Debasis Bandyopadhyay	2 st Sem	Marketing Management	Introduction, Consumer
			(UG BCOM-H-CC-T-03)	Behaviour and Market
				Segmentation, Product,
			Business	Statistical Data, Diagrammatic
			Mathematics and	representation, Different
			Statistics	Measures of Central Tendency,
			(UG BCOM-H-GE-T-02)	Different Measures of
				Despersion, Simple Correlation
				Analysis, SimpleRegression
				Analysis, Index Numbers.
3.	Basudev Sinha	2 st Sem	Marketing Management	Price and Promotion,
			(UG BCOM-H-CC-T-03)	Distribution and Retailing
			Business Laws	The Indian Contract Act, 1872,
			(UG BCOM-H-CC-T-04)	The Sale of Goods Act, 1930, The
				Partnership Act, 1932,
4.	Md. Hazarat Ali	2 st Sem	Business Laws	The Limited Liability Partnership
			(UG BCOM-H-CC-T-04)	Act, 2008, The Negotiable
				Instruments Act 1881.

Distribution of' Syllabus for UG B.Com (Hons) Session-2019-2020 (w.c.f. 01.07.2019 to 31.12.2019)

SI. No.	Name of Teacher	Class	Name of the Subject	Details of the Subject
1.	Arup Ratan Misra	3 rd Sem	Financial Accounting- 2 (UG BCOM-H-CC-T-05)	Introduction to Company Accounts, Accounting for Shares and Debentures of Company, Investment Accounts, Insurance claim.
			E-Commerce & Computer Applications in Business (UG BCOM-H-SEC-T+P- 01A)	Introduction, Models of E-Cmmerce, Digital Money Transactions, e- Commerce in India, Computer Applications in Business (Practical)
2.	Debasis Bandyopadhyay	3 rd Sem	Income Tax Law (UG BCOM-H-CC-T-06)	Income from Salaries, Income from House Property, Profits and Gains from Business or Profession, Capital Gain, Income from Other Sources, Set off and Carry Forward of Losses, Deductions from Gross Total Income, Computation of Total Income and Tax Liability of an Individual.
			Macro Economics (UG BCOM-H-GE-T-03)	Macro Economics –Introduction, National Income Accounting, Determination of Equilibrium Level of Income.
3.	Basudev Sinha	3 rd Sem	Financial Accounting- 2 (UG BCOM-H-CC-T-05)	Partnership Accounts, Branch Accounting, Hire Purchase and Installment Payment system, Departmental Accounts.
			Human Resource Management (UG BCOM-H-CC-T-07)	Human Resource Management- Training and Development Job Evaluation and Performance Appraisal. Nature and Scope, Human Resource Planning, Recruitment and Selection,
4.	Md. Hazarat Ali	3 rd Sem	Income Tax Law (UG BCOM-H-CC-T-06)	Basic Concepts and Definitions under Income Tax Act, 1961, Residential Status of an individual and Incidence of Tax, Fully Exempted income of an Individual, Agricultural Income.
			Macro Economics (UG BCOM-H-GE-T-03)	Commodity Market and Money Market Equilibrium, Money and Inflation.

Distribution of' Syllabus for UG B.Com (Hons) Session-2019-2020 (w.c.f. 01.01.2020 to 30.6.2020)

SI.	Name of Teacher	Class	Name of the Subject	Details of the Subject
1.	Arup Ratan Misra	4 th Sem	Indirect Tax Laws (UG BCOM-H-CC-T-09)	Introduction, Supply, Registration, Documentation, Input Tax Credit.
			Tax Returns and Filing of Tax Returns (UG BCOM-H-SEC-T-02A)	Return under Income Tax, PAN and TAN, Payment of Advance Tax and Self Assessment Tax, Interest, Filing of Returns, Procedure of filing e-Return, ITR1 only. Returns under Goods and Service Tax, Practical on hard copy of ITR 1
2.	Debasis Bandyopadhyay	4 th Sem	Cost Accounting (UG BCOM-H-CC-T-08)	Introduction, Costs, Material Costs, Labour Costs, Overhead Costs, Contract Costing,
			Indian Economics (UG BCOM-H-GE-T-04)	Basic Issues of Indian Development, Basic Issues of Indian Economy, Agricultural Sector.
3.	Basudev Sinha	4 th Sem	Cost Accounting (UG BCOM-H-CC-T-08)	Process Costing, Operating Costing, Cost Control Accounts.
			Indirect Tax Laws (UG BCOM-H-CC-T-09)	GST Returns- GSTR 1, GSTR2 GSTR3 , Payment of GST – Through Input Tax Credit, By cash/bank after generation of online Challan.
4.	Md. Hazarat Ali	4 th Sem	Company Law (UG BCOM-H-CC-T-10)	Introduction, Documents,Formation of Company, Management, Company Meetings.
			Indian Economics (UG BCOM-H-GE-T-04	Industrial Sector, External Sector.

Distribution of' Syllabus for UG B.Com (Hons) Session-2020-2021 (w.c.f. 01.07.2020 to 31.12.2020)

SI.	Name of Teacher	Class	Name of the Subject	Details of the Subject
No. 1.	Arup Ratan Misra	5 th Sem	Corporate Accounting	Schedule III(Division I) of the
			(UG BCOM-H-CC-T-11)	Companies Act 2013, Final Accounts of Companies, Redemption of Preference Shares and Debentures, Accounting of Limited Liability Partnership.
2.	Debasis Bandyopadhyay	5 th Sem	Accounting for Local Bodies (UG BCOM-H-DSE-T-02A)	Introduction, 73 rd Amendment of the Constitutionin 1992, Article 243J,Provisions related to Accounts in the West Bengal Panchyat Act, 1973, Financial Statements of Municipalities, Accounting Standards, Financial Statements of PRIs (Panchayat Raj Institutions) and Municipalities,
			Business Communication And Entrepreneurship Development (UG BCOM-H-DSE-T-01A)	Entrepreneurship Development- Introduction, Entrepreneurship Roles in Different Business Environment, Entrepreneur and Law, Financing of New Ventures, Project Planing and Feasibility Studies.
3.	Basudev Sinha	5 th Sem	Auditing (UG BCOM-H-CC-T-05)	Introduction, Internal Control, Vouching & Verification.
			Corporate Accounting (UG BCOM-H-CC-T-11)	Reconstruction of Companies, Valuation, Holding Company.
4.	Md. Hazarat Ali	5 th Sem	Business Communication And Entrepreneurship Development (UG BCOM-H-DSE-T-01A)	Business Communication, Significance of Communication, Business Productivity, Inter Group and Intra Group Conflict, Management Information System (MIS), Tools of Communication, Practice in Effective Communication.
			Auditing (UG BCOM-H-CC-T-05)	Audit of Limited Companies, Auditors' Report.

Distribution of' Syllabus for UG B.Com (Hons) Session-2020-2021 (w.c.f. 01.01.2021 to 30.6.2021)

SI.	Name of Teacher	Class	Name of the Subject	Details of the Subject
1.	Arup Ratan Misra	6 th Sem	Management Accounting (UG BCOM-H-DSC-T-03A)	Introduction, Budget and Budgetary Control, Standard Costing, Cost Volume Profit
			Indian Financial System (UG BCOM-H-DSE-T-04A)	Analysis and Marginal Costing. Financial System, Reserve Bank of India- Organisation, Management, Functions, Monetary Policy, Development Banks
2.	Debasis Bandyopadhyay	6 th Sem	Indian Financial System (UG BCOM-H-DSE-T-04A) Financial Management (UG BCOM-H-CC-T-13)	Insurance Sector, Regulatory Bodies. Fundamentals of Financial Management, Sources of Finance and Cost of Capital, Working
3.	Basudev Sinha	6 th Sem	Management Accounting (UG BCOM-H-DSC-T-03A)	Capital and Its Management. Ratio Analysis, Common Size Statements.
			Financial Management (UG BCOM-H-CC-T-13)	Capital Structure and Leverage, Capital Budgeting, Dividend Decision, Fund Flow Statement, Cash Flow Statement.
4.	Md. Hazarat Ali	6 th Sem	Project Work (UG BCOM-H-CC-T-14)	Project Report and Presentation, Viva- Voce.
			DISTRIBUTION OF SYLLABUS	
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			Dumkal College	
			Session 2018-2019 Nome of the Department: Environmental studies	
		ľ	Name of the Teacher:- Parimal Saha	
MONTHS	SEMESTER	COURSE	CONTENT	NO OF
				PERIOD
July	1 st	AECC	Unit-1 Introduction & Environmental Studies	-
	Honours		Multidisciplinary nature of environmental studies; Scope and importance;	
	course			
			What is an ecosystem? Structure and function of ecosystem: Energy flow in	-
			an ecosystem: food chains, food webs and ecological succession. Case studies	
			of the following ecosystems:	
			Forest ecosystem	
			Grassland ecosystem	
			 Deserve cosystems Aquatic ecosystems (nonds, streams, lakes, rivers, oceans, estuaries) 	
August	1st		Unit 3: Natural Resources: Renewable and Non-renewable Resources	-
			Land resources and landuse change; Land degradation, soil erosion and decortification	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			• Water use and over-exploitation of surface and ground water, floods,	
			droughts, conflicts over water (international & inter-state).	
			Energy resources: Renewable and non renewable energy sources, use of	
September	1st		Unit 4: Biodiversity and Conservation	-
September	150		Levels of biological diversity: genetic. species and ecosystem diversity:	-
			Biogeographic zones of India; Biodiversity patterns and global	
			biodiversity hot spots.	
			 India as a mega-biodiversity nation; Endangered and endemic species of 	
			India.	
			conflicts. biological invasions: Conservation of biodiversity: In-situ and	
			Ex-situ conservation of biodiversity.	
			Ecosystem and biodiversity services: Ecological, economic, social,	
Neurope	1+		ethical, aesthetic and Informational value.	
November	IST			-
			 Environmental pollution; types, causes, effects and controls; Air, water, 	
			soil and hoise pollution.	
			 Solid waste management: Control measures of urban and industrial 	
			waste.	
			Pollution case studies.	
			Unit 6 Environmental Policies & Practices	
			Climate change, global warming, ozone layer depletion, acid rain and	
			impacts on human communities and agriculture	
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Pollution) Act. Water (Prevention and control of Pollution)	
			Act, Wildlife Protection Act, Forest Conservation Act, International	
			agreements. Montreal and Kyoto protocols and Convention on Biological	
			Diversity (CBD)	
			Nature reserves, tribal populations and rights, and human wildlife	
December	1 ct		conflicts in Indian context.	
December	131		Human nonulation growth: Impacts on environment, human health and	-
			welfare.	
			Resettlement and rehabilitation of project affected persons; case	
			studies.	
			Disaster management floods, earthquake, cyclones and landslides.	
			Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.	
			Environmental ethics: Kole of Indian and other religions and cultures in environmental conservation	
			 Environmental communication and public awareness, case studies (e.g., 	
			CNG vehicles in Delhi).	

Months	semester	course	content	No of Period
January	2 nd	AFCC	Unit-1 Introduction & Environmental Studies	Feriou
	Programme Course		Multidisciplinary nature of environmental studies; Scope and	
			Unit-2- Ecosystem	
			What is an ecosystem? Structure and function of ecosystem; Energy flow	
			in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:	
			Forest ecosystem	
			Grassland ecosystem	
			 Desert ecosystem Aquatic ecosystems (ponds streams lakes rivers oceans 	
			estuaries)	
February	2 nd		Unit 3: Natural Resources: Renewable and Non-renewable Resources	
			 Land resources and landuse change; Land degradation, soil erosion and desertification. 	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			 Water use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). 	
			Energy resources: Renewable and non renewable energy sources,	
			use of alternate energy sources, growing energy needs, case studies	
March	2 nd		Unit 4: Biodiversity and Conservation	
			Levels of biological diversity: genetic, species and ecosystem	
			global biodiversity hot spots.	
			India as a mega-biodiversity nation; Endangered and endemic	
			species of India. Threats to biodiversity: Habitat loss poaching of wildlife man	
			wildlife conflicts, biological invasions; Conservation of biodiversity:	
			In-situ and Ex-situ conservation of biodiversity.	
			 Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. 	
April	2 nd		Unit 5: Environmental Pollution	
			Environmental pollution; types, causes, effects and controls; Air,	
			 water, soil and noise pollution. Nuclear hazards and human health risks. 	
			Solid waste management: Control measures of urban and industrial	
			waste.	
			Unit 6 Environmental Policies & Practices	
			Climate change, global warming, ozone layer depletion, acid rain	
			and impacts on human communities and agriculture	
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Pollution) Act. Water (Prevention and control of	
			Pollution) Act, Wildlife Protection Act, Forest Conservation Act.	
			International agreements. Montreal and Kyoto protocols and Convention on Biological Diversity (CBD)	
			 Nature reserves, tribal populations and rights, and humam wildlife 	
N Anti-	and		conflicts in Indian context.	
(1-15 th)	2		Uluman nonvitation growth impacts on anvisonment human health	
			and welfare.	
			Resettlement and rehabilitation of project affected persons; case	
			 Studies. Disaster management floods earthquake cyclones and landslides 	
			 Environmental movements: Chipko, Silent valley, Bishnois of 	
			Rajasthan.	
			 Environmental etnics: Kole of Indian and other religions and cultures in environmental conservation. 	
			Environmental communication and public awareness, case studies	
		1	(e.g., CNG vehicles in Delhi).	

			DISTRIBUTION OF SYLLABUS			
			Dumkal College			
		N	Session 2019-2020 Nome of the Department: Environmental studies			
Name of the Teacher:- Parimal Saha						
MONTHS	SEMESTER	COURSE	CONTENT	NO OF		
				PERIOD		
July	1 st	AECC	Unit-1 Introduction & Environmental Studies	-		
	Course		Nultidisciplinary nature of environmental studies; scope and importance;			
	course		Unit-2- Ecosystem	-		
			What is an ecosystem? Structure and function of ecosystem; Energy flow in	-		
			an ecosystem: food chains, food webs and ecological succession. Case studies			
			of the following ecosystems:			
			Forest ecosystem			
			Grassland ecosystem Desort accounter			
			 Aquatic ecosystems (nonds streams lakes rivers oceans estuaries) 			
August	1st		Unit 3: Natural Resources: Renewable and Non-renewable Resources	-		
			Land resources and landuse change; Land degradation, soil erosion and desertification			
			 Deforestation: Causes and impacts due to mining, dam building on 			
			environment, forests, biodiversity and tribal populations.			
			• Water use and over-exploitation of surface and ground water, floods,			
			droughts, conflicts over water (international & inter-state).			
			Energy resources: Renewable and non renewable energy sources, use of alternate analysis growing analysis and so			
September	1st		Unit 4: Biodiversity and Conservation	-		
September	150		 Levels of biological diversity: genetic, species and ecosystem diversity; 	-		
			Biogeographic zones of India; Biodiversity patterns and global			
			biodiversity hot spots.			
			 India as a mega-biodiversity nation; Endangered and endemic species of localized 			
			India.			
			conflicts. biological invasions: Conservation of biodiversity: In-situ and			
			Ex-situ conservation of biodiversity.			
			Ecosystem and biodiversity services: Ecological, economic, social,			
Neurope	1+		ethical, aesthetic and Informational value.			
November	ISt			-		
			 Environmental pollution; types, causes, effects and controls; Air, water, 			
			soil and hoise pollution.			
			 Solid waste management: Control measures of urban and industrial 			
			waste.			
			Pollution case studies.			
			Unit 6 Environmental Policies & Practices			
			Climate change, global warming, ozone layer depletion, acid rain and			
			impacts on human communities and agriculture			
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Pollution) Act. Mater (Prevention and control of Pollution)			
			Act Wildlife Protection Act Forest Conservation Act International			
			agreements. Montreal and Kyoto protocols and Convention on Biological			
			Diversity (CBD)			
			Nature reserves, tribal populations and rights, and human wildlife			
December	1.c+		conflicts in Indian context.			
December	131		Human nonulation growth: Impacts on anyisarment human hashb and	4		
			welfare.			
			Resettlement and rehabilitation of project affected persons; case			
			studies.			
			Disaster management floods, earthquake, cyclones and landslides.			
			• Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.			
			Environmental ethics: Role of Indian and other religions and cultures in anvironmental concernation			
			Environmental communication and nublic awareness, case studies (e.g.			
			CNG vehicles in Delhi).			

Months	semester	course	content	No of Period
January	2 nd	AFCC	Unit-1 Introduction & Environmental Studies	Feriou
	Programme Course		Multidisciplinary nature of environmental studies; Scope and	
			Unit-2- Ecosystem	
			What is an ecosystem? Structure and function of ecosystem; Energy flow	
			in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:	
			Forest ecosystem	
			Grassland ecosystem	
			 Desert ecosystem Aquatic ecosystems (ponds streams lakes rivers oceans 	
			estuaries)	
February	2 nd		Unit 3: Natural Resources: Renewable and Non-renewable Resources	
			 Land resources and landuse change; Land degradation, soil erosion and desertification. 	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			 Water use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). 	
			Energy resources: Renewable and non renewable energy sources,	
			use of alternate energy sources, growing energy needs, case studies	
March	2 nd		Unit 4: Biodiversity and Conservation	
			Levels of biological diversity: genetic, species and ecosystem	
			global biodiversity hot spots.	
			India as a mega-biodiversity nation; Endangered and endemic	
			species of India. Threats to biodiversity: Habitat loss poaching of wildlife man	
			wildlife conflicts, biological invasions; Conservation of biodiversity:	
			In-situ and Ex-situ conservation of biodiversity.	
			 Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. 	
April	2 nd		Unit 5: Environmental Pollution	
			Environmental pollution; types, causes, effects and controls; Air,	
			 water, soil and noise pollution. Nuclear hazards and human health risks. 	
			Solid waste management: Control measures of urban and industrial	
			waste.	
			Unit 6 Environmental Policies & Practices	
			Climate change, global warming, ozone layer depletion, acid rain	
			and impacts on human communities and agriculture	
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Pollution) Act. Water (Prevention and control of	
			Pollution) Act, Wildlife Protection Act, Forest Conservation Act.	
			International agreements. Montreal and Kyoto protocols and Convention on Biological Diversity (CBD)	
			 Nature reserves, tribal populations and rights, and humam wildlife 	
N Anti-	and		conflicts in Indian context.	
(1-15 th)	2		Uluman nonvitation growth impacts on anvisonment human health	
			and welfare.	
			Resettlement and rehabilitation of project affected persons; case	
			 Studies. Disaster management floods earthquake cyclones and landslides 	
			 Environmental movements: Chipko, Silent valley, Bishnois of 	
			Rajasthan.	
			 Environmental etnics: Kole of Indian and other religions and cultures in environmental conservation. 	
			Environmental communication and public awareness, case studies	
		1	(e.g., CNG vehicles in Delhi).	

			DISTRIBUTION OF SYLLABUS	
			Dumkal College	
		N	Session 2021-2022 Nome of the Department: Environmental studies	
			Name of the Teacher:- Parimal Saha	
MONTHS	SEMESTER	COURSE	CONTENT	NO OF
				PERIOD
July	1 st	AECC	Unit-1 Introduction & Environmental Studies	
	Course		Nultidisciplinary nature of environmental studies; scope and importance;	
	course		Unit-2- Ecosystem	
			What is an ecosystem? Structure and function of ecosystem; Energy flow in	
			an ecosystem: food chains, food webs and ecological succession. Case studies	
			of the following ecosystems:	
			Forest ecosystem	
			Grassland ecosystem Desort accounter	
			 Aquatic ecosystems (nonds streams lakes rivers oceans estuaries) 	
August	1st		Unit 3: Natural Resources: Renewable and Non-renewable Resources	
			Land resources and landuse change; Land degradation, soil erosion and decertification	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			• Water use and over-exploitation of surface and ground water, floods,	
			droughts, conflicts over water (international & inter-state).	
			Energy resources: Renewable and non renewable energy sources, use of	
Sentember	1 st		alternate energy sources, growing energy needs, case studies.	
September	130		Levels of biological diversity: genetic, species and ecosystem diversity:	
			Biogeographic zones of India; Biodiversity patterns and global	
			biodiversity hot spots.	
			India as a mega-biodiversity nation; Endangered and endemic species of	
			India.	
			conflicts, biological invasions: Conservation of biodiversity: In-situ and	
			Ex-situ conservation of biodiversity.	
			• Ecosystem and biodiversity services: Ecological, economic, social,	
			ethical, aesthetic and Informational value.	
November	1st		Unit 5: Environmental Pollution	
			• Environmental pollution; types, causes, effects and controls; Air, water,	
			soil and noise pollution.	
			 Nuclear fidzards and futurial field fisks. Solid waste management: Control measures of urban and industrial 	
			waste.	
			Pollution case studies.	
			Unit 6 Environmental Policies & Practices	
			Climate change, global warming, ozone layer depletion, acid rain and	
			impacts on human communities and agriculture	
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Dellution) Act. Motor (Descention and control of Dellution)	
			Act Wildlife Protection Act, Water (Prevention and control of Pollution)	
			agreements. Montreal and Kyoto protocols and Convention on Biological	
			Diversity (CBD)	
			Nature reserves, tribal populations and rights, and human wildlife	
Describer	4+		conflicts in Indian context.	
December	151		Onit 7. numan communities and the Environment	
			 numan population growth: impacts on environment, numan health and welfare 	
			Resettlement and rehabilitation of project affected persons: case	
			studies.	
			• Disaster management floods, earthquake, cyclones and landslides.	
			• Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.	
			Environmental ethics: Role of Indian and other religions and cultures in	
			erivironmental conservation.	
			CNG vehicles in Delhi).	

Months	semester	course	content	No of Period
January	2 nd	AFCC	Unit-1 Introduction & Environmental Studies	Feriou
	Programme Course		Multidisciplinary nature of environmental studies; Scope and	
			Unit-2- Ecosystem	
			What is an ecosystem? Structure and function of ecosystem; Energy flow	
			in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:	
			Forest ecosystem	
			Grassland ecosystem	
			 Desert ecosystem Aquatic ecosystems (ponds streams lakes rivers oceans 	
			estuaries)	
February	2 nd		Unit 3: Natural Resources: Renewable and Non-renewable Resources	
			 Land resources and landuse change; Land degradation, soil erosion and desertification. 	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			 Water use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). 	
			Energy resources: Renewable and non renewable energy sources,	
			use of alternate energy sources, growing energy needs, case studies	
March	2 nd		Unit 4: Biodiversity and Conservation	
			Levels of biological diversity: genetic, species and ecosystem	
			global biodiversity hot spots.	
			India as a mega-biodiversity nation; Endangered and endemic	
			species of India. Threats to biodiversity: Habitat loss poaching of wildlife man	
			wildlife conflicts, biological invasions; Conservation of biodiversity:	
			In-situ and Ex-situ conservation of biodiversity.	
			 Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. 	
April	2 nd		Unit 5: Environmental Pollution	
			Environmental pollution; types, causes, effects and controls; Air,	
			 water, soil and noise pollution. Nuclear hazards and human health risks. 	
			Solid waste management: Control measures of urban and industrial	
			waste.	
			Unit 6 Environmental Policies & Practices	
			Climate change, global warming, ozone layer depletion, acid rain	
			and impacts on human communities and agriculture	
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Pollution) Act. Water (Prevention and control of	
			Pollution) Act, Wildlife Protection Act, Forest Conservation Act.	
			International agreements. Montreal and Kyoto protocols and Convention on Biological Diversity (CBD)	
			 Nature reserves, tribal populations and rights, and humam wildlife 	
N Anti-	and		conflicts in Indian context.	
(1-15 th)	2		Uluman nonvitation growth impacts on anvisonment human health	
			and welfare.	
			Resettlement and rehabilitation of project affected persons; case	
			 Studies. Disaster management floods earthquake cyclones and landslides 	
			 Environmental movements: Chipko, Silent valley, Bishnois of 	
			Rajasthan.	
			 Environmental etnics: Kole of Indian and other religions and cultures in environmental conservation. 	
			Environmental communication and public awareness, case studies	
		1	(e.g., CNG vehicles in Delhi).	

			DISTRIBUTION OF SYLLABUS	
			Dumkal College	
			Session 2022-2023 Nome of the Department: Environmental studies	
			Name of the Teacher:- Parimal Saha	
MONTHS	SEMESTER	COURSE	CONTENT	NO OF
				PERIOD
July	1 st	AECC	Unit-1 Introduction & Environmental Studies	-
	Course		Nultidisciplinary nature of environmental studies; scope and importance;	
	course		Unit-2- Ecosystem	-
			What is an ecosystem? Structure and function of ecosystem; Energy flow in	-
			an ecosystem: food chains, food webs and ecological succession. Case studies	
			of the following ecosystems:	
			Forest ecosystem	
			Grassiand ecosystem Desert ecosystem	
			 Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) 	
August	1st		Unit 3: Natural Resources: Renewable and Non-renewable Resources	-
			Land resources and landuse change; Land degradation, soil erosion and desertification	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			• Water use and over-exploitation of surface and ground water, floods,	
			droughts, conflicts over water (international & inter-state).	
			Energy resources: Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.	
September	1st		Unit 4: Biodiversity and Conservation	-
			• Levels of biological diversity: genetic, species and ecosystem diversity;	-
			Biogeographic zones of India; Biodiversity patterns and global	
			biodiversity hot spots.	
			 India as a mega-biodiversity nation; Endangered and endemic species of India 	
			 Threats to biodiversity: Habitat loss, poaching of wildlife, manwildlife 	
			conflicts, biological invasions; Conservation of biodiversity: In-situ and	
			Ex-situ conservation of biodiversity.	
			Ecosystem and biodiversity services: Ecological, economic, social,	
November	1st		ethical, aesthetic and informational value.	
November	150			-
			 Environmental pollution; types, causes, effects and controls; Air, water, soil and poise pollution 	
			 Nuclear hazards and human health risks. 	
			Solid waste management: Control measures of urban and industrial	
			waste.	
			Pollution case studies.	-
			Unit 6 Environmental Policies & Practices	-
			Climate change, global warming, ozone layer depletion, acid rain and	
			Environment Laws Environment Protection Act. Air (Prevention &	
			Control of Pollution) Act, Water (Prevention and control of Pollution)	
			Act, Wildlife Protection Act, Forest Conservation Act. International	
			agreements. Montreal and Kyoto protocols and Convention on Biological	
			Diversity (CBD)	
			Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context	
December	1st		Unit 7: Human Communities and the Environment	
			Human population growth: Impacts on environment, human health and	1
			welfare.	
			Resettlement and rehabilitation of project affected persons; case	
			studies.	
			 Disaster management floods, earthquake, cyclones and landslides. Environmental movements: Chinka Silent valley, Bishnais of Poisether 	
			 Environmental movements: Chipko, Silent Valley, Bisnnois of Kajasthan. Environmental ethics: Role of Indian and other religions and cultures in 	
			environmental conservation.	
			• Environmental communication and public awareness, case studies (e.g.,	
			CNG vehicles in Delhi).	

Months	semester	course	content	No of Period
January	2 nd	AFCC	Unit-1 Introduction & Environmental Studies	Feriou
	Programme Course		Multidisciplinary nature of environmental studies; Scope and	
			Unit-2- Ecosystem	
			What is an ecosystem? Structure and function of ecosystem; Energy flow	
			in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:	
			Forest ecosystem	
			Grassland ecosystem	
			 Desert ecosystem Aquatic ecosystems (ponds streams lakes rivers oceans 	
			estuaries)	
February	2 nd		Unit 3: Natural Resources: Renewable and Non-renewable Resources	
			 Land resources and landuse change; Land degradation, soil erosion and desertification. 	
			 Deforestation: Causes and impacts due to mining, dam building on 	
			environment, forests, biodiversity and tribal populations.	
			 Water use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). 	
			Energy resources: Renewable and non renewable energy sources,	
			use of alternate energy sources, growing energy needs, case studies	
March	2 nd		Unit 4: Biodiversity and Conservation	
			Levels of biological diversity: genetic, species and ecosystem	
			global biodiversity hot spots.	
			India as a mega-biodiversity nation; Endangered and endemic	
			species of India. Threats to biodiversity: Habitat loss poaching of wildlife man	
			wildlife conflicts, biological invasions; Conservation of biodiversity:	
			In-situ and Ex-situ conservation of biodiversity.	
			 Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. 	
April	2 nd		Unit 5: Environmental Pollution	
			Environmental pollution; types, causes, effects and controls; Air,	
			 water, soil and noise pollution. Nuclear hazards and human health risks. 	
			Solid waste management: Control measures of urban and industrial	
			waste.	
			Unit 6 Environmental Policies & Practices	
			Climate change, global warming, ozone layer depletion, acid rain	
			and impacts on human communities and agriculture	
			Environment Laws. Environment Protection Act. Air (Prevention & Control of Pollution) Act. Water (Prevention and control of	
			Pollution) Act, Wildlife Protection Act, Forest Conservation Act.	
			International agreements. Montreal and Kyoto protocols and Convention on Biological Diversity (CBD)	
			 Nature reserves, tribal populations and rights, and humam wildlife 	
N Anti-	and		conflicts in Indian context.	
(1-15 th)	2		Uluman nonvitation growth impacts on anvisonment human health	
			and welfare.	
			Resettlement and rehabilitation of project affected persons; case	
			 Studies. Disaster management floods earthquake cyclones and landslides 	
			 Environmental movements: Chipko, Silent valley, Bishnois of 	
			Rajasthan.	
			 Environmental etnics: Kole of Indian and other religions and cultures in environmental conservation. 	
			Environmental communication and public awareness, case studies	
		1	(e.g., CNG vehicles in Delhi).	