Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2022-2023

Department: **Geology**

Semester: First B.Sc.

Honours

Core Course (CC)

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE& Enakshi Das	**C1T: Earth System Science**	**Unit 1: Earth System Science**	1. Definition and scope; General characteristics and origin of the Universe, Solar System and itsplanets; the Terrestrial and Jovian planets.	**01/10/2022**	1	**45**
			2. Meteorites and Asteroids		1	
			3. Earth in the solar system - origin, size, shape, mass, density, rotational and revolution parametersand its age.		1	
		Unit 2: Solid Earth, Hydrosphere, Atmosphere and Biosphere	1.Internal constitution - its recognition vis-à-vis solid earth geophysics: crust, mantle, core, evidencefrom seismic waves		2	
			2. Earthquake and earthquake belts: Seismic waves and internal constitution of the Earth		2	
			3. Volcanoes and volcanism, distribution of volcanoes		1	
			4. Concept of isostasy		1	
			5.Hydrosphere, atmosphere and biosphere: Elementary idea		1	
			6. Nature of Earth's magnetic field and geothermal gradient.		1	
			7. Fossil, Evolution and Charles Darwin		1	
		Unit 3: Plate Tectonics	1. Historical development of the concept of continental drift and plate tectonics		1	
			2. Plates and Plate boundaries		1	

			3. Geodynamic elements of Earth: Mid Oceanic Ridges, trenches, transform faults and island arcs		1	
			4. Plate tectonics: mountain belts and rift valleys		1	
		Unit 4: Hydrosphere and Atmosphere	Oceanic current system and effect of Coriolis force Concepts of eustasy Land-sea interaction along coast Weather and climatic changes		5	
		Unit 5: Earth surface processes	Weathering; erosion; mass wasting; Geological work of wind, river and glacier Formation of soil, soil profile and soil types		10	
		Unit 6: Cosmic abundance of elements	Distribution of elements in solar system and in Earth Introduction to chemical differentiation and composition of the Earth General concepts about geochemical cycles		5	
		Unit 7: Understanding the past from stratigraphic records	1. Nature of stratigraphic records		1	
			2. Fundamental laws of stratigraphy: Laws of superposition and faunal succession, Concepts of neptunism, plutonism, uniformitarianism.		1	
			3. Concept of time and geological time scale. Absolute and relative time in Geology.		1	
			4. Concept of radiometric dating. Radiometric dating of rocks and minerals: U-Pb, Pb-Pb, K Ar, Rb-Sr, Sm-Nd method. Dating igneous and sedimentary rocks.		6	

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE	**C1P: EARTH SYSTEM SCIENCE**	1.Study of major geomorphic features and their relationships with outcrops through physiographic models and maps		**01/10/2022**	6	**18**
		2. Detailed study of topographic sheets and preparation of physiographic description of an area			8	
		3. Study of distribution of cratons, mobile belts and major sedimentary basins on the map of India.			2	
		4. Identification, state of preservation of fossils			2	
LOVELY BURMAN	**C2T2: MINERAL SCIENCE**	**Unit 1: Crystallography**	1.Elementary ideas about crystal morphology in relation to internal structures	**01/10/2022**	1	**40**
			2. Crystal parameters and Miller indices		2	
			3.Crystal symmetry and classification of crystals into point groups, space groups and crystal systems		3	
			4. Stereographic projections of symmetry elements and forms, Herman Mauguin notation		3	
		Unit 2: Rock forming minerals	1.Minerals - definition and classification, physical and chemical properties		2	
			2. Chemical classification of minerals		1	
			3. Composition of common oxides, carbonated, sulphides and sulphates and phosphates		1	
			4. Composition of common rock-forming minerals		1	

		Unit 3: Atomic arrangements and Mineralogical structure	1. Crystal structure and its controls: bonding and coordination principles, atomic arrangement: unit cell, CCP and HCP structures.		3	
			2. Brief idea about Pauling's rules, Solid solution, Pseudomorphism and Polymorphism: elementary concept on principle types – common polymorphic forms of C, SiO_2 and Al_2SiO_5		3	
			3. Classification of silicate groups based on structure and derivation of structural formulae based on composition.		6	
		Unit 4: Optical mineralogy	1.Optical behaviour of crystals – Isotropic and anisotropic minerals; Nicol prism and its principle;		2	
			2.Refractive index of minerals; Uniaxial & Biaxial minerals; Optical indicatrix of uniaxial and biaxialminerals; Birefringence, Interference colour and use of interference colour chart; Relation betweencrystallographic and optical axes of crystals		6	
			3.Pleochroism and pleochroic scheme; Extinction; Study of interference figures; Optic sign of uniaxial and biaxial minerals		6	
		1. Study of the symmetry of crystals			4	
	C2P: MINERAL SCIENCE	2. Study of physical properties of minerals in hand specimen: Olivine, Garnet, Sillimanite, Kyanite, Staurolite, Beryl, Tourmaline, Pyroxene, Actinolite, Tremolite, Hornblende, Serpentine, Talc,Muscovite, Biotite, Quartz, Alkali feldspar, Plagioclase, Nepheline, Sodalite, ZeolitePyrite, Chalcopyrite, Galena, Sphalerite, Graphite, Magnetite, Haematite, Fluorite, Calcite, Dolomite,Gypsum, Asbestos, Ilmenite,		**01/10/2022**	9	**28**

		Chromite, Pyrolusite, Psilomelane, Bauxite			
		3.Study of optical properties of common rock-forming minerals: quartz, orthoclase, microcline, plagioclase, perthite, nepheline, olivine, orthopyroxene, clinopyroxene, hornblende, staurolite, garnet, muscovite, biotite, calcite		15	

Contd....

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: First B.Sc.

General

Core Course-DSC

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus	Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE	**DSC-1AT (CC-1): Physical and Structural Geology**	**Unit-I**: Introduction to geology and its scope, Earth and solar system: origin, size, shape, mass, density and its atmosphere.	**01/10/2022**	2	**31**
		Unit-II: A brief account of various theories regarding the origin and age of the earth; Brief idea of interior of earth and its composition.		3	
		Unit-III: Weathering and erosion: factors, types and their effects		3	
		Unit-IV: Earthquakes: nature of seismic waves, their intensity and magnitude scale; Origin of earthquake and preventive measures; Volcanoes: types, products and causes of volcanism.		4	
LOVELY BURMAN		**Unit-V**: Introduction to Structural Geology; contours, topographic and geological maps; Elementary idea of bed, dip and strike; Outcrop, effects of various structures on outcrop. Clinometer / Brunton compass and its use.		2	
		Unit-VI: Elementary idea of types of deformation, Concept of stress strain, Foliations and lineations; Folds: nomenclature and types of folds.		10	
		Unit-VII: Faults: nomenclature, geometrical and genetic classifications, normal, thrust and slip faults.		3	

		Unit-VIII: Definition, kinds and significance of joints and unconformity		4	
	DSC-1AP: Practical	**Physical Geology:** Study of important geomorphological models; Reading topographical maps of the Survey of India; Identification of geomorphic features. **Structural Geology:** Study of clinometers/Brunton compass; Identification of different types of folds/faults from block models; Exercises on structural problems: preparation of cross section profile from a geological map.	**01/10/2022**	10 12	**22**

Contd....

			Calcite.			
		Unit-VII:	Polarizing microscope, its parts and functioning; Ordinary and polarized lights;Common optical properties observed under ordinary, polarized lights and crossed nicols.		5	
		Unit-VIII:	Optical properties of some common rock forming minerals (Quartz, Orthoclase, Microcline, Olivine, Augite, Hornblende, Muscovite, Biotite, Garnet, Calcite).		4	
	DSC1BP: Practical	**Crystallography:** Study of symmetry elements of normal class of Isometric, Tetragonal, Hexagonal, Trigonal, Orthorhombic, Monoclinic and Triclinic systems.			10	**20**
		Mineralogy: Study of physical properties of minerals mentioned in theory course.Use of polarizing microscope; Study of optical properties of common rock formingminerals mentioned in theorycourse.			10	

Contd....

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: Third B.Sc.

Honours

Core Course (CC)

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE	**C5T: Igneous Petrology**	**Unit 1: Introduction to Igneous petrology**	1. Modes of magma formation in the crust and upper mantle	**01/10/2022**	1	
			2. Physical properties of magma - temperature, viscosity, density and volatile content		1	
			3. Modes of emplacement of igneous rocks: volcanic, hypabyssal, plutonic		1	
		Unit 2: Forms of Igneous rock bodies	1. Mode of occurrence of Igneous rocks		1	
			2. Forms of igneous rocks		1	
		Unit 3: Texture and microstructure of Igneous rocks	1. Crystallinity, granularity, shapes and mutual relations of grains; nucleation and growthof igneous minerals		2	
			2. Description of the following textures and microstructures with their occurrence indifferent rocks - panidiomorphic, hypidiomorphic, allotriomorphic, porphyritic, vitrophyric, poikilitic, ophitic, sub-ophitic, intergranular, intersertal, pilotaxitic,trachytic, graphic,		2	

			granophyric, rapakivi, orbicular, corona, perthitic, myrmekitic, variolitic, speherulitic&spinifex			
			3. Binary and Ternary Phase diagrams in understanding crystal-melt equilibrium inbasaltic and granitic magmas		2	
			4. Magma generation in crust and mantle, their emplacement and evolution		2	
		Unit 4: Classification of igneous rocks	1. Bases of classification of igneous rocks: mineralogical, textural, chemical, chemicomineralogical and associational; Norm and mode; Standard classification schemes – Niggli, Wells & Wells and IUGS. TAS diagram for volcanic rocks		3	
			2. Composition and texture of important igneous rocks: Granitoids, Pegmatite, Syenite, Monzonite, Diorite, Norite, Gabbro, Anthrothosite, Dolerite, Pyroxenites, Peridotite, Lamprophyres, Carbonatite, Rhyolite, Andesite, Dacite, Basalt, Komatiite		2	**40**
		Unit 5: Phase Diagrams	Phase Rule and its application to eutectic, peritectic and solid solution system: Phase equilibria in the following binary and ternary systems, and their petrogenetic significance: diopside – anorthite, forsterite – silica, albite – anorthite, albite – orthoclase, diopside –		10	

			albite – anorthite, forsterite – diopside – silica and nepheline - kalsilite – silica.			
		Unit 6: Petrogenesis of Igneous rocks	1. Magma generation in crust and mantle, their emplacement and evolution		2	
			2. Petrogenesis of Felsic and Mafic igneous rocks: Granitoids, Basalt, Gabbros,Anorthosite, Komatiites, Alkaline rocks, Kimberlites		4	
		Unit 7: Magmatism in different tectonic settings	1. Magmatism in the oceanic domains (MORB, OIB)		2	
			2. Magmatism along the subduction zones: Island arcs andcontinental arcs		2	
			3. Magmatism along continental rifts		2	
	C5P: Igneous Petrology	1. Study of important igneous rocks in hand specimens and thin sections: granite,granodiorite, diorite, syanite, nephelinesyenite, gabbro, anorthosites, ultramaficrocks, basalts, andesites, trachyte, rhyolite, dacite		**01/10/2022**	15	**25**
		2. Norm calculation. Visual estimation of modes from thin sections			7	
		3. Plotting of mode in IUGS classification of plutonic rocks (Streckeisen diagram)			3	
LOVELY BURMAN	**C6T:** Sedimentary Petrology	**Unit 1: Introduction to Sedimentology**	Outline of sedimentation process: Definition of sediment; origin of sediments: mechanicaland chemical sediments; source rock or provenance	**01/10/2022**	3	
		Unit 2: Granulometry	Grain size: concept and size scale, particle size distribution, environmental connotation;particle		4	**33**

			shape and fabric; Sedimentary textures			
		Unit 3: Basic hydraulics and Sedimentary structures	1. Fluid flow: Types of fluids, Laminar and turbulent flow, subcritical, critical andsupercritical flows; concept of mean flow velocity, unit discharge and bed shear stress;flow profile and flow separation; particle entrainment, transport and deposition		2	
			2. Mass flow: types, mechanisms and controlling factors, process-product relationship		2	
			3. Penecontemporaneousdeformation: mechanisms and controlling factors		2	
			4. Sedimentary structure: Primary and penecontemporaneous deformation structures		2	
			5. Bedform stability diagram		2	
			6. Paleocurrent analysis: Data acquisition, methodology, different palaeocurrent patterns		2	
		Unit 4: Sedimentary rocks	1. Siliciclastic rocks: Components and classification(s) of conglomerates and sandstones		3	
			2. Tectonic control on sandstone composition 3. General introduction to Mudrocks, Carbonate rocks; controlling factors of carbonate deposition; components and classifications of limestone; dolomite and dolomitisation		1 5	
		Unit 5:	1. Concepts of diagenesis		1	

		Diagenesis	2. Stages of diagenesis: diagenetic changes in sand and carbonate deposits, lithification		4	
	C6P: Sedimentary Petrology	1. Identification of sedimentary structures		01/10/2022		2
		2. Particle size distribution and statistical analysis			4	
		3. Paleocurrent analysis			1	**22**
		4. Petrographic study of clastic and non-clastic rocks through hand specimens and thinsections			15	
LOVELY BURMAN	**C7T: Paleontology**	**Unit 1: Fossilization and fossil record**	1. Fossilization: definition of fossil, fossilization processes and modes of preservation,exceptional preservation		1	**44**
			2. Taphonomy: definition, different types of taphonomic filters		1	
		Unit 2: Taxonomy and Systematics	1. Taxonomy: concept of taxonomy and taxonomic hierarchy		1	
			2. Biological and morphological species concept		1	
		Unit 3: Evolution and History of Life	1. Theory of organic Evolution: theory, concept of adaptation and variation, NaturalSelection. Precambrian – doubtful organic traces of life during the Precambrian,Ediacaran fauna		4	
			2. Paleozoic – Cambrian Explosion of life. Episodes of mass extinction		2	
			3. Plants: Appearance of angiosperma and gymnosperma		1	
			4. Appearance of fish, amphibia, reptiles, birds, mammals and humans		1	
			5. Mass extinction: five major extinction episodes and their causes; effect of extinction		2	
		Unit 6:	1. Definitions: Biozones, index		1	

		Application of fossils in Stratigraphy	fossils, stratigraphic correlation, examples - significance of ammonites in Mesozoic paleobiostratigraphy			
			2. Application of fossils in Paleoenvironmental analysis	01/10/2022	1	
			3. Fossils and paleobiogeography, 2 biogeographic provinces, dispersals andbarriers.Paleoenvironmental analysis			
APARUPA BANERJEE	**C7T: Paleontology**	**Unit 4: Invertebrates and Vertebrates**	1. Brief introduction to important invertebrate groups (Bivalvia, Gastropoda, Brachiopoda) and their biostratigraphic significance		6	
			2. Significance of ammonites in Mesozoic biostratigraphy and their paleobiogeographic implications. Functional adaptation in trilobites and ammonoids		4	
			3. Origin of vertebrates and major steps in vertebrate evolution		2	
			4. Mesozoic reptiles with special reference to origin, diversity and extinction of dinosaurs		4	
			5. Evolution of horse and intercontinental migrations		2	
			6. Human evolution		2	
		Unit 5: Introduction to Paleobotany, Gondwana Flora Introduction	1. Introduction to Paleobotany, Gondwana Flora, Plants as indicator of past climate		4	
			2. Ichnology and its application in paleoecology		2	

		to Ichnology			
APARUPA BANERJEE	**C7P: Paleontology Lab**	1. Study of fossils with various modes of preservation	**01/10/2022**	2	**30**
		2. Study of systematic position, stratigraphic position and age of various invertebrate,vertebrate and plant fossils		4	
		3. Study of functional morphological characters of different groups (Bivalvia, Gastropods, Brachiopoda, Echinodermata, Ammonoidea, Gondwana flora, vertebrates)		6	
		4. Identification of feeding habits from vertebrate (horse, elephants, Sus) teeth		2	
		5. Hard part morphology and identification of common Brachiopoda, Anthozoa, Trilobita, Echinoidea, Gastropoda. Identification of Gondwana flora		16	

Contd....

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: Third B.Sc.

Honours

Skill Enhancement Course (SEC)

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus	Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
-	**FIELD GEOLOGY SEC1**	-	-	-	-

Contd...

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: Third B.Sc.

Honours

Generic Elective (GE)

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
LOVELY BURMAN	**GE-3T Fossils and Their Applications**	**Unit 1: Introduction to Fossils**	Definition of fossil, fossilization processes (taphonomy), taphonomic attributes and its implications, modes of fossil preservation, role of fossils in development of geological time scale and fossils sampling techniques.	**01/10/2022**	6	**38**
		Unit 1I: Species concept	Definition of species, species problem in paleontology, speciation, methods of description and naming of fossils, code of systematic nomenclature (3)			
		Unit 1II: Introduction to various fossils groups	Brief introduction of important fossils groups: invertebrate, vertebrate, microfossils, spore, pollens and plant fossils. Important age-diagnostic Fossiliferous horizons of India		16	
		Unit 1V: Application of fossils	Principles and methods of paleoecology, application of fossils in the study ofpaleoecology, paleobiogeography and paleoclimate		8	

		Unit 5: Economic importance of fossils	Implication of larger benthic and micropaleontology in hydrocarbon exploration:identification of reservoirs and their correlation. Application of spore and pollens in correlation of coal seams, spore and pollens as indicator of thermal maturity ofhydrocarbons reservoirs, fossils associated with mineral deposits, fossils as an indicator of pollution.		5	
	GE-3P Fossils and TheirApplications	1. Study of fossils showing various modes of fossilization		**01/10/2022**	3	**18**
		2. Study of important fossils from India (list may be prepared by the department concern)			15	

Contd....

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: Third B.Sc.

General

Core Course-DSC

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE	**DSC1C: Petrology (Theory)**	**Igneous Petrology**	**Unit-I:** Magma: definition, composition, types and origin; Forms of igneous rocks; textures and structures of igneous rocks. **Unit-II**: Reaction principle; Differentiation and Assimilation; Crystallization of unicomponent and bicomponent (mix-crystals); Bowen's reaction series. **Unit-III**: Mineralogical and chemical classification of igneous rocks. **Unit-IV**: Detailed petrographic description of Granite, Granodiorite, Rhyolite, Syenite, Diorite, Basalt, Gabbro.	**01/10/2022**	8 4 3 2	
		Metamorphic Petrology	**Unit-VII:** Process and controlling factors of metamorphism; Type of metamorphism. Facies, zones and grade of		10	**31**

			metamorphism; Textures, structures and classification of metamorphic rocks. **Unit-VIII**: Petrographic details of some important metamorphic rocks such as - slate,schists, gneiss, quartzite, marble.		4	
	DSC1CP: Practical	**Igneous Petrology:**				
		Identification of rocks: On the basis of their physical properties in hand specimen; and optical properties in thin sections. **Sedimentary and Metamorphic Petrology:** Identification of sedimentary and metamorphic rocks both in hand specimen and thin sections.		**01/10/2021**		**24**
	DSC1C: Petrology	**Sedimentary**	**Unit-V:** Processes of formation of		8	
LOVELY BURMAN	**(Theory)**	**Petrology**	sedimentary rocks; Classification, textures and structures of sedimentary rocks; **Unit-VI:** Petrographic details of important siliciclastic and carbonate rocks such as - conglomerate, breccia, sandstone, greywacke, shale, limestone	**01/10/2022**	4	**12**

Contd...

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: Fifth B.Sc.

Honours

Core Course (CC)

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE	**C11T: Hydrogeology**	**Unit 1: Introduction and basic concepts**	1. Scope of hydrogeology and its societal relevance. Global and Indian distribution ofwater resource	**14/09/2022**	1	
			2. Hydrologic cycle: precipitation, evapo-transpiration, run-off, infiltration and groundwater flow. Basic concept of hydrographs Origin of groundwater, Verticaldistribution of subsurface water, Genetic classification of groundwater.		3	

			3. Classification of rocks with respect to water bearing characteristics, geomorphic and geologic controls of groundwater, Types of aquifer– unconfined, confined and semiconfined. Water table and piezometric surface. Groundwater provinces in India and West Bengal.		3	
			4. Rock properties affecting groundwater: Porosity, void ratio, specific retention and Storage coefficient - specific yield, specific storage and storativity, Anisotropy and heterogeneity of aquifers		2	
		Unit 2: Groundwater flow	1. Darcy's law and its validity; Reynold'sNumber.Ground water velocity.		2	
			2. Intrinsic permeability and hydraulic conductivity, Transmissivity, Measurement of hydraulic conductivity in laboratory – Constant Head Permeameter and Falling(Variable) Head Permeameter. Water Table and Piezometric surface		4	

			contour maps and Groundwater flow direction, Laminar and turbulent groundwater flow			**42**
		Unit 3: Well hydraulics and Groundwater exploration	1. Basic Concepts (drawdown; specific capacity etc)		2	
			2. Elementary concepts related to equilibrium and non-equilibrium (Steady and unsteady) conditions for groundwater flow to a well		2	
			3. Surface-based groundwater exploration methods Introduction to subsurface borehole logging methods		4	
		Unit 4: Groundwater chemistry	1. Physical, chemical and bacteriological properties of water and water quality		3	
			2. Introduction to methods of interpreting groundwater quality data using standardgraphical plots		3	
			3. Elementary concept on Groundwater pollution: Arsenic, Fluoride and Nitrate, Seawater intrusion in coastal aquifers - Ghyben-Herzberg Relation		5	
		Unit 5: Groundwater management	1. Surface and subsurface water interaction.		3	

			Recharge and discharge areas.Ground water level fluctuations. Effects of Climate Change on Ground water			
			2. Basic concepts of water balance studies, issues related to groundwater resourcesdevelopment and management		3	
			3. Rainwater harvesting and artificial recharge of groundwater		2	
	C11P: Hydrogeology (Lab)	1. Preparation and interpretation of depth to water level maps and water level contour maps. Study, preparation and analysis of hydrographs for differing groundwater conditions		**14/09/2022**	10	**20**
		2. Water potential zones of India (map study)			2	
		3. Graphical representation of chemical quality data and water classification (C-S and Trilinear diagrams). Simple numerical problems related to: determination of permeability in field and laboratory and Groundwater flow			8	
LOVELY BURMAN	**C12T: Economic Geology**	**Unit 1: Ores and gangues**	1. Ores, gangue minerals, tenor, grade and lodes.	**14/09/2022**	1	**46**
			2. Resources and reserves- Economic and Academic definitions		1	
		Unit 2: Mineral deposits and classical concepts of ore formation	1. Mineral occurrence, Mineral deposit and ore deposit		1	
			2. Historical concepts of ore genesis: Man's earliest vocation- Mining		1	
			3. Plutonist and Neptunist		1	

			concepts of ore genesis			
			4. Metallogenic provinces and epochs		1	
		Unit 3: Mineral exploration	1. Exploration and exploitation techniques		2	
			2. Brief idea on: Remote Sensing, Geophysical and Geochemical Explorations		6	
			3. Geological mapping at different scales, drilling, borehole logs and transverse sections		3	
		Unit 4: Structure and texture of ore deposits	1. Concordant and discordant ore bodies		2	
			2. Endogenous processes: Magmatic concentration, skarns, greisens, and hydrothermaldeposits		8	
			3. Exogenous processes: weathering products and residual deposits, oxidation andsupergene enrichment, placer deposits		6	
		Unit 5: Ore grade and Reserve	Assessment of ore grade and reserve, reserve estimation		2	
		Unit 6: Metallic and Non-metallic ores	1. Important deposits of India including atomic minerals: Study of geologic set up, mode of occurrence, mineralogy and genesis of the following ore deposits in India - Iron ore in Singhbhum and		6	

			Karnatake, Manganese of Central India, Copper of Malanjkhand, lead-zinc of Zawar area, Uranium of Singh bhum.			
			2. Non-metallic and industrial rocks and minerals, in India. 3. Introduction to gemstones.		4 1	
	C12P: Economic Geology	1. Hand sample identification of important ores and non-metallic minerals		**14/09/2022**	4	
		2. Study of microscopic properties of ore forming minerals (Oxides and sulphides)			8	
		3. Preparation of maps: Distribution of important ores and other economic minerals in India			2	**14**

Contd...

Shahid Matangini Hazra Government College for Women

Lesson Plan for the academic session 2020-21

Department: **GEOLOGY**

Semester: Fifth B.Sc.

Honours

Discipline Specific Elective (DSE)

Name of the Teacher	Title of the Teaching Assignment	Dividing the Assignment into Number of Units along with detailed lesson plan as per the University Syllabus		Date of Commencement of the Assignment	Number of classes required to complete each unit	Total number of class
APARUPA BANERJEE	**DSE1T: Introduction to Geophysics**	**Unit 1: Geology and Geophysics**	1. What is geophysics?	**14/09/2022**	1	**40**
			2. Interrelationship between geology and geophysics		1	
		Unit 2: General and Exploration geophysics	1. Different types of geophysical methods - gravity, magnetic, electrical and seismic; Principles of different methods. Applications of different methods.Elements of well logging		12	
			2. Corrections in geophysical data		2	
		Unit 3: Geophysical field operations	1. Data acquisition and Processing. Data reduction.Signal and noise.		4	
			2. Different types of surveys, grid and route surveys, profiling and sounding techniques a. Scales of survey b. Presentation of geophysical data		6	
		Unit 4: Application of Geophysical methods	1. Regional geophysics, oil and gas geophysics, ore geophysics, groundwater geophysics, engineering geophysics		4	
			2. Geological interpretation of geophysical data		2	
		Unit 5: Geophysical	1. Correction to measured quantities, geophysical, anomaly, regional and		3	

		anomalies	residual (local)anomalies,factors controlling anomaly			
			2. Depth of exploration		2	
		Unit 6: Integrated geophysical methods	Ambiguities in geophysical interpretation, planning and execution of geophysical surveys		3	
	DSE1P: Introduction to Geophysics	1. Anomaly and background- Graphical method.		**14/09/2022**	6	**16**
		2. Study and interpretation of seismic reflector geometry.			6	
		3. Gravity anomaly: Problems on gravity anomaly.			4	
LOVELY BURMAN	**DSE2T: Fuel Geology**	**Unit 1: Energy Resources**	Different Sources of energy: Global and Indian scenario	**14/09/2022**	2	**44**
		Unit 2: Coal	1. Definition and origin of Coal		2	
			2. Basic classification of coal		1	
			3. Fundamentals of Coal Petrology - Introduction to lithotypes, microlithotypes and macerals in coal		3	
			4. Proximate and Ultimate		1	
			5. Major coal basins of India		3	
		Unit 3: Coal as a fuel	1. Concept of clean coal technology		2	
			2. Coal Bed Methane (CBM): global and Indian scenario		3	
			3. Underground coal gasification		2	
			4. Liquefaction of coal		2	
		Unit 4: Petroleum	1. Chemical composition and physical properties of crudes oil		3	
			2. Origin and migration of petroleum		3	
			3. Kerogen: Maturation of kerogen; Biogenic and Thermal effect		3	
		Unit 5: Petroleum Reservoirs and Traps	1. Reservoir rocks: general attributes and petrophysical properties		2	
			2. Cap Rocks: definition and general properties		1	
			3. Hydrocarbon traps: definition,		8	

			Classification of hydrocarbon traps - structural, stratigraphic and combination a. Time of trap formation and time of hydrocarbon accumulation. b. Plate tectonics and global distribution of hydrocarbon reserves c. Petroliferous basins of India			
		Unit 6: Other fuels	1. Nuclear Fuel		2	
			2. Gas Hydrate		1	
	DSE2P: Fuel Geology	1. Study of hand specimens of coal		**14/09/2022**	2	**18**
		2. Reserve estimation of coal			4	
		3. Section correlation and identification of hydrocarbon prospect			6	
		4. Panel and Fence diagrams			6	

Contd....