Department of Geology

Jagannath Barooah University

Teaching Plan for **Dr. Chaitra Dhar Taye**, Session :2025-26

Odd Semester: 2025-26

Class/Semester	Title & Code of The Paper Allotted (credit)	Method of Teaching	Teaching Material	Unit	Topic	Period/ Hours Required	Details of the Contents	Remarks/Books
B.Sc. 1st Semester	**Fundamentals of Earth System Science I (GEOMJ-011)** (4 Credits)	Lecture, PPT Presentation, Discussion	Whiteboard, LCD Projector, Topographic and World Maps	Unit III	Interior of the Earth	8 hours	Understanding the mechanical layering of the Earth through seismic waves. Formation and elemental composition of crust, mantle, and core. Geomagnetism: causes, changes, and effects.	*1. Plate Tectonics and Crustal Evolution* by Kent C. Condie, *The Blue Planet* by Skinner & Porter *2. Essentials of Geology* by F.J. Press & R. Siever, *Planet Earth* by C. Emiliani
B.Sc. 1st Semester	**Fundamentals of Earth System Science I (GEOMI-011)** (4 Credits)	Lecture, Discussion, Visual Aids	Whiteboard, LCD Projector, Earth's internal structure diagrams	Unit III	Interior of the Earth	8 hours	Understanding the mechanical layering of the Earth through seismic waves. Formation and elemental composition of crust, mantle, and core.	*1. Plate Tectonics and Crustal Evolution* by Kent C. Condie, *The Blue Planet* by Skinner & Porter *2. Essentials of Geology* by F.J.

							Geomagnetism: causes, changes, and effects.	Press & R. Siever, *Planet Earth* by C. Emiliani
B.Sc. 3rd Semester	**Elements of Geochemistry (GEOMJ-033)** (4 Credits)	Lecture, Problem-solving, Data Analysis	Whiteboard, LCD Projector, Periodic Table, Geochemical charts	ALL	ALL Units	45 hours	**Unit I:** Geochemical environment, mobility of elements. **Unit II:** Geochemical cycle, residence time. **Unit III:** Radiogenic isotopes, principles of crystal chemistry. **Unit IV:** Geochemistry of magmatic and metamorphic processes. **Unit V:** Environmental geochemistry.	*Principles of Geochemistry* by Brian Mason, *Geochemistry* by W.M. White
B.Sc. 3rd Semester	**Rocks and Minerals (GEOMI-031)** (4 Credits)	Lecture, Demonstration with Crystal Models	Whiteboard, LCD Projector, Crystal Models, Mineral Hand Specimens	Unit I	Crystallography	6 hours	Elementary ideas about crystal morphology, faces, edges, and solid angle. Crystal symmetry and classification of crystals into six systems. Crystal parameters and indices.	*The Manual of Mineral Science* by Klein & Dutrow, *Rutley's Elements of Mineralogy* by H.H. Read
B.Sc. 3rd	**Introduction to**	Lecture, Group	Whiteboard, LCD	ALL	ALL Units	45 hours	A fundamental understanding of the	*Introduction to Earth Science* by

Semester	**Earth Science (GEOMU-031)** (3 Credits)	Discussion, Case Study	Projector, Relevant articles				processes involved in the planet earth and common natural resources. Topics include geological processes, natural resources, and environmental issues.	Laura Neser, *Earth System Science* by Jacobson et al.
B.Sc. 5th Semester	**Hydrogeology and Oceanography (GEOMJ-053)** (4 Credits)	Lecture, PPT Presentation, Map Analysis	Whiteboard, LCD Projector, Hydrogeological and Oceanographic maps	ALL	ALL Units	60 hours	**Unit I:** Fundamentals of Hydrogeology (hydrologic cycle, aquifers, groundwater flow). **Unit II:** Groundwater exploration and management. **Unit III:** Introduction to Oceanography (ocean basins, physical properties of seawater). **Unit IV:** Ocean currents, tides, and waves. **Unit V:** Marine geology and resources.	*Applied Hydrogeology* by C.W. Fetter, *Essentials of Oceanography* by T. Garrison

Even Semester: 2025-26

Class/ Semester	Title & Code of The Paper Allotted (credit)	Method of Teaching	Teaching Material	Unit	Topic	Period/ Hours Required	Details of the Contents	Remarks/Books
B.Sc. 2nd Semester	**Fundamentals of Earth System Science II (GEOMJ-021)** (4 Credits)	Lecture, PPT Presentation, Rock Specimen Demonstration	Whiteboard, LCD Projector, Rock specimens	Unit III	Introduction to Petrology	15 hours	Definitions and types of rocks, basics of rock formation and the rock cycle. Magma and lava. Formation of sedimentary rocks. Metamorphism of rocks.	*Petrology* by H. Williams et al., *Understanding Earth* by J. Grotzinger & T.H. Jordan
B.Sc. 2nd Semester	**Fundamentals of Earth System Science II (GEOMI-021)** (4 Credits)	Lecture, Discussion, Rock and Mineral Hand Specimens	Whiteboard, LCD Projector, Rock specimens	Unit III	Introduction to Petrology	15 hours	Definitions and types of rocks, basics of rock formation and the rock cycle. Magma and lava. Formation of sedimentary rocks. Metamorphism of rocks.	*Principles of Igneous and Metamorphic Petrology* by J.D. Winter
B.Sc. 2nd Semester	**Introduction to Earth Science (GEOMU-021)** (3 Credits)	Lecture, Group Discussion, Visual Aids	Whiteboard, LCD Projector, Relevant articles	ALL	ALL Units	45 hours	A fundamental understanding of the processes involved in the planet earth and common natural resources. Topics include geological	*Introduction to Earth Science* by Laura Neser, *Earth System Science* by Jacobson et al.

							processes, natural resources, and environmental issues.	
B.Sc. 4th Semester	**Igneous Petrology (GEOMJ-041)** (4 Credits)	Lecture, Microscopic Study, Data Analysis	Whiteboard, LCD Projector, Petrological Microscope, Igneous rock thin sections	ALL	ALL Units	45 hours (Theory)	**Unit I:** Concept of magma generation. **Unit II:** Textures, structures, and classification of igneous rocks. **Unit III:** Phase diagrams and petrogenesis. **Unit IV:** Magmatism and tectonic settings. **Unit V:** Petrogenesis of igneous rocks.	*Principles of Igneous and Metamorphic Petrology* by Philpotts & Ague, *Igneous Petrology* by Myron G. Best

B.Sc. 6th Semester	**Engineering Geology (GEOMJ-062)** (4 Credits)	Lecture, Case Study, Fieldwork Demonstration	Whiteboard, LCD Projector, Geological maps, case study reports	ALL	ALL Units	60 hours	**Unit I:** Introduction to Engineering Geology, role of geology in civil engineering. **Unit II:** Physical properties of rocks and soils relevant to engineering. **Unit III:** Geological investigations for dams, bridges, and tunnels. **Unit IV:** Natural hazards and their mitigation (landslides, earthquakes). **Unit V:** Building materials and groundwater.	*Engineering Geology* by K.M. Bangar, *Fundamentals of Engineering Geology* by F.G. Bell