

Discipline Specific Elective (DSE)

Name of Programme: M. Sc. Applied Geology

Course Code: GEO-521

Title of the Course: Marine Geology

No of Credits: 03

Effective from AY: 2022-23

Prerequisites for the course:	Degree of Bachelor of Science in Geology from any UGC recognized University or an equivalent examination.	
Objective:	To provide a conceptual understanding of marine processes, landforms, marine minerals, methods of geo-physical surveys for sea-bed mapping and coastal zone management.	
Content:	Module I Introduction and scope of marine geology, coastal zone and coastline classifications, beach and beach landforms, oceanic profile and landform features, morphologic and tectonic domain of the ocean floor, origin of oceanic crust, marine sediment and classification, ocean tectonics. Coastal surveys including beach profiling, Exclusive Economic Zone, concept and causes of sea level changes and measurements, Holocene sea level curves and future projections, Introduction to paleo-beaches and paleo-oceanography, coastal geomorphology and coastal tectonic framework of India.	15 hours
	Module II Classification of marine mineral deposits, origin and depositional system of marine resources, beach placers, shelf deposits, phosphorites, gas hydrates, hydrocarbon deposits, sulphate deposits, hydro-thermal deposits, polymetallic nodules, reserves and economics of marine resources with special reference to India. Introduction to marine geophysics, methods of geophysical surveys for seabed mapping and mineral exploration; Introduction to marine geochemistry, laboratory methods for sample analyses; Introduction to isotope geology and geochronology.	15 hours
	Module III Coastal zone management, coastal erosion and protection measures, coastal natural disasters and management, salt water intrusion and submarine ground water discharge, marine spatial planning, coastal zone regulation and acts, the law of the seas.	15 hours

Pedagogy:	Lectures/ tutorials/assignments/field study/discussion	
References/Readings	<ol style="list-style-type: none"> 1. Shepard, <i>Submarine Geology</i>, Third Edition. 2. Kuenen, P. <i>Marine Geology</i>, 2008, John Wiley. 3. Cuchlaine A.M.King, <i>Introduction to Marine Geology and Geomorphology</i> 4. M.J.Keen, <i>Introduction to Marine Geology</i>, Elsevier. 5. James Kennet, <i>Marine Geology</i>, 1982, Prentice Hall 6. Chester and Jickells, 2012, <i>Marine Geochemistry</i>, Wiley 7. Roy-Barman and Jeandel, 2016, <i>Marine Geochemistry</i>, Oxford University Press. 8. Jones, <i>Marine Geophysics</i>, 1999, John Wiley and Sons Inc 	
Course outcomes	<ol style="list-style-type: none"> 1. students will able to explain the coastal processes and landforms 2. detail understanding on processes of mineral formation 3. students will acquire indepth knowledge about ocean tectonics 4. students will learn in detail about coastal zone management and remedial measures. 	