Fundamentals of Marine Resources and Exploration Techniques

LTP: 3-0-0 **Credits: 3**

(Lecture Hrs.: 14x3 =42)

Continental Margins and Ocean basins, seafloor tectonics, oceanic and continental crust, Hotspots, Earthquakes and Tsunami linkages, SOFAR channel.

Processes controlling deposition, erosion and transportation of marine sediments, Offshore hydrocarbon deposits and their origin, Paleoclimatic studies of marine sediments, Sealevel fluctuations, Coastal Hazards, Basics of sequence stratigraphy.

Marine Wealth: Hydrothermal circulations and associated mineral deposits, Polymetallic nodules, Gashydrate deposits and their stability zone including distribution along India's coastal regions. Marine Exploration Methods, Survey Design, Marine exploration and measuring instruments such as seismic streamers (SCS and MCS), hydrophones and geophones, Marine reflection/refraction seismic instruments, Ocean bottom seismometers, Gravimeters, Magnetometers, CTD, sonar), and observational networks, Data acquisition, Processing and interpretation. International Indian Ocean Expedition (IIOE), Integrated Ocean Drilling Program (IODP),
Base line- Territorial waters-EEZ and other maritime zones, Continental Shelf, Protection of Marine Resources, International Seabed Authority, Law of the Sea Conventions 1982. Geopolitics of the Indian Ocean.

Books:

1. The Sea Floor: An Introduction to Marine Geology, by Seibold, Eugen, Berger, Wolfgang H. (Springer, 2017, ISBN 978-3-319-51412-3)
2. Submarine Geomorphology, Editors: Aaron Micallef, Sebastian Krastel, Alessandra Savini, (Springer, 2018, ISBN 978-3-319-57852-1)
3. Marine Geophysics, by E. J. W. Jones(Wiley, 1999, ISBN-978-0-471-98694-2)
4. Physics of Tsunamis, by Levin, Boris W., Nosov, Mikhail A. (Springer, 2016, ISBN 978-3-319-24037-4)
5. Law of the Sea: Maritime Boundaries and Dispute Settlement Mechanisms, by MOM Ravin, United Nations Report.

(**Note:**:There may be 5-7% overlap with MARINE GEOSCIENCES AND PALEOCLIMATES(GG60016) course of GG.

Lectures	Syllabus
Lecture 1-8	Continental Margins and Ocean basins, seafloor tectonics, oceanic and continental crust, Hotspots, Earthquakes and Tsunami linkages, SOFAR channel.
Lecture 9-19	Processes controlling deposition, erosion and transportation of marine sediments, Offshore hydrocarbon deposits and their origin, Paleoclimatic studies of marine sediments, Sealevel fluctuations, Coastal Hazards, Basics of sequence stratigraphy.
Lecture 20-35	Marine Wealth: Hydrothermal circulations and associated mineral deposits, Polymetallic nodules, Gashydrate deposits and their stability zone including distribution along India's coastal regions. Marine Exploration Methods, Survey Design, Marine exploration and measuring instruments such as seismic streamers (SCS and MCS), hydrophones and geophones, Marine reflection/refraction seismic instruments, Ocean bottom seismometers, Gravimeters, Magnetometers, CTD, sonar), and observational networks, Data acquisition, Processing and interpretation. International Indian Ocean Expedition (IIOE), Integrated Ocean Drilling Program (IODP).
Lecture 36-42	Base line- Territorial waters-EEZ and other maritime zones, Continental Shelf, Protection of Marine Resources, International Seabed Authority, Law of the Sea Conventions 1982. Geopolitics of the Indian Ocean.