Programme: M. Sc. (Marine Sciences)
Course Code: MSC 469 **Title of the Course: Tectonics, Geophysics and Structural Geology**
Number of Credits: 04
Effective from AY: June2018-19

Prerequisites for the course:	Fundamental courses in all the branches of Marine Sciences of this University or any other University recognized as equivalent and courses defined in semester III
Objective:	This course introduces tectonics – Earthquakes, Volcanoes, Mountain chains, geophysical methods – Gravity, Magnetic and Seismic, and Structural Geology with respect to concepts and applications in Earth processes.

Content:	Earth Quakes - classification, magnitude, epi-centre, recoding - seismographs, shadow zone, important earth quakes, causes. Volcanoes - magma, lava, volcanic land forms, famous eruptions. Mountains and mountain chains Principles of geophysical methods: Gravity, magnetic and seismic – Elucidation of the structure of the earth using seismic model. Instruments used in marine geophysics – Gravimeter, magnetometer for marine studies, echosounder, side scan sonar and sparker. Hydrography – position fixing, depth measurement and sea bed mapping technique, hydrographic chart. Computation, plotting and interpretation of gravity variations, identification of anomalies and interpretation of the data set. Computation of depth of ore body using half anomaly method. Apply gravity corrections and observations. Computation, plotting and interpretation of magnetic variations, identification of anomalies and interpretation of the data set. Computation of depth of a single pole using half anomaly and peter's slope methods. Computation and interpretation of seismic data variations to understand depth of horizontal sedimentary bed using both reflection and refraction methods. Study of seismic profiles, sections and interpretation of features. Integrated interpretation of geophysical data, Application of geophysical methods in offshore exploration for oil natural gas and other minerals. Structural Geology - Folds - parts of fold, nomenclature, types, causes; Faults - nomenclature, types; Joints. Minerals and their physical properties, Rocks - classification and properties. Ground water and saline water intrusion on the coastal plain and ground water.	12 hours 12 hours 12 hours 12 hours
Pedagogy:	Lectures / Assignments / Seminars / Discussion	
References/ Readings	1. Introductory oceanography (5thed), 1988 Thurman, H.V., Columbus Mercill Publ. Co, Ohio. 2. Oceanography (5thed), 1990 Grant Gross, M., Englewood Cliffs, N.J. Prentice Hall. 3. Marine Geology and Oceanography of the Arabian Sea and coastal Pakistan, 1984 Haq. B. U. and Milliman, J. D., Van Norstrand Reinhold Co. 4. Marine Geology, 1982 James P. Kennet, Prentice Hall INC Englewood, Cliffs, N. J. 07632. 5. Earth Science, 1985-Mamowitz and Spaulding,Heath and Company, Heath. 6. Principles of Geophysical Prospecting, 1976 Dobrin, M. B., Mc.Graw Hill. 7. Geophysical Prospecting for Oil, 1976 Nettleton, L. L., McGraw Hill. 8. Exploration Seismology (Vol. 1 and 2) 1982, 1983 Sheriff, R. E. and Geldant, L. P., Cambridge Univ. Press, U.K.36 9. Developments in Solid Earth Geophysics (Vol.5) Spectral analysis in geophysics, 1974 Bath Markens. 10. Seismic Prospecting Instruments (Vol.1) 1972 Evenden, B. S., Stone, D. R. and Anstey, Gebrudev Borntraege,*Berlin.* 11. Structural Geology, 1972 M.P. Billings, Third Edition,Prentice Hall College Div.	
Learning Outcomes	1. Understanding tectonics, geophysical methods and structural geology – their concepts and application in understanding earth processes. 2. Ability to use concepts to understand earth processes and reconstruct tectonics and paleoenvironments.	