

Programme: M. Sc. (Marine Sciences)

Course Code: MSO 377

Number of Credits: 01

Effective from AY: June 2018-19

Title of the Course: Marine Geochemistry III

Prerequisites for the course:	Should have undergone the course Marine Chemistry (MSC 162).	
Objective:	This course develops concepts about the geochemistry of the marine environment that concerns chemistry of solid-solution interface and surface phenomena in aquatic systems.	
Content:	The solid-solution interface – Electro-kinetic phenomena, The electrical double layer, the structure of water at the solid solution interface, surface chemistry of oxides, hydroxides and oxide minerals; the colloidal state, origin of surface charge, aggregation of colloids, the role of coagulation in natural waters – Surface phenomena – Langmuir and Freundlich Adsorption isotherms, trace metal partitioning on solid-solution phases, particle concentration effects.	12 hours
Pedagogy:	Lectures/ tutorials/ assignments/ self-study	
References/ Readings	1. Introduction to Geochemistry, 1967 - Krauskopf, K.B., Mc.Graw-hill. 2. Geochemistry, 1962 – Goldschmidt, V.M., Clarendon Press. 3. Principles of Geochemistry 1956 – Mason, B. and Moore, B., John Wiley. 4. Chemical Oceanography (Vol. 1 & 3), 1975 – Riley, J.P. and Skirrow, G., Academic Press. 5. Introduction to Geochemistry, 1995 – Krauskopf, K.B. and Bird, Mc-Graw Hill. 6. The Geochemistry of Natural Waters, 1982, 2002 – Drever, J.I., Prentice Hall. 7. Estuarine Chemistry, 1976 – Burton, J.D. and Liss, P.S., Academic Press. 8. Ocean Chemistry and Deep Sea Sediments, 1989, 1991 – Open University Course Material. 9. Aquatic Chemistry, 1996 – Stumm, W. and Morgan, J.J., Wiley- Interscience, New York. 10. Aquatic Surface Chemistry, 1987 – Stumm, W., Wiley – Interscience, New York. 11. Marine Chemistry, 1969 – Horne, R.A., Wiley Interscience. 12. Text Book of Physical Chemistry, 1981, Glasstone, S., Macmillan India Press. 13. Marine Chemistry and Geochemistry, 2010 – K.K.Turekian, Academic press.	
Learning Outcomes	1. Explain the importance of surface phenomena in the geochemistry of marine environment/aquatic systems. 2. Develop mathematical basis for adsorption isotherms applicable to trace metals in natural waters. 3. Explain the importance of the role played by colloids in trace metals cycling in marine environment/natural waters.	