

Optional Courses (Theory)

GLO-201: Groundwater Geology	3-0-0 = 3 credits
Introduction: Genetic classification of water, global distribution of water. Hydrologic cycle: precipitation, runoff, infiltration and evapotranspiration. Historical developments in science of hydrogeology. Vertical distribution of sub surface water, classification of aquifers and confining layers, hydraulic properties of aquifers, water table fluctuations. Concepts of drainage and groundwater basins. Water table and piezometric surface. Well Hydraulics and well designs: Theory of groundwater flow, Darcy's law, its validity and applications, determination of permeability in laboratory and in field. Types of wells, drilling methods, construction, design, development and maintenance of wells. Specific capacity and its determination Steady and unsteady and radial flow conditions. Pumping tests-methods, data analysis and interpretations. Seawater intrusion. Groundwater Chemistry: Groundwater quality-physical, chemical, biological properties of water quality criteria for different uses, graphical presentation of water quality data, problems of arsenic and fluoride in India Saline water intrusion in coastal aquifers and its prevention. Groundwater contamination. Groundwater occurrence and exploration: Classification of rocks with respect to their water bearing characteristics, groundwater provinces of India. Groundwater exploration techniques. <u>List of Books</u> 1. Todd D.K.: Groundwater hydrology, John Wiley, NY , 1980 2. Raghunath, H.M.: Ground Water, New Age International Publishers, 2007 3. Fetter, C.W.: Applied hydrogeology, NY, Macmillan, 1994 4. Davis and De Wiest: Hydrogeology	
GLO-202: Petroleum Geology	3-0-0 = 3 credits
Introduction to petroleum. Physical properties and chemical composition of petroleum. Origin of Petroleum. Petroleum Traps and Reservoir rocks. Primary and secondary migration and Accumulation. Petroleum exploration. Petroliferous basins of India. Oil belts of the world. <u>List of Books</u> 1. Selley, R.C., 1998, Elements of Petroleum Geology: W.H. Freeman & Company, New York. 2. Tissot, B.P., and Welte, D.H., 1978, Petroleum Formation and Occurrence - A New Approach to Oil and Gas Exploration: Springer -Verlag, Berlin. 3. Levorsen , A.I., 1967, Geology of Petroleum: W.H. Freeman and Company. 4. North, F.K., 1986, Petroleum Geology: Allen & UnWin, 607p	
GLO-203: Exploration Geophysics	3-0-0 = 3 credits
Introduction to exploration geophysics: Electrical methods: instrumentation, field procedure and interpretation using electrical methods. Electrical profiling and sounding using Wenner and Schlumberger configurations. Principles and fundamental procedures of data collection and interpretation.	