**CE803 GROUNDWATER GEOLOGY 3-0-1-4**

**Objectives:**

1. To understand the concepts of groundwater geology
2. To understand the problems of groundwater flow dynamics
3. Emphasizing the importance of applied hydrology in socio economic aspects

**Unit-I**

Origin of water: meteoric, juvenile and magmatic, hydrology, hydrogeology, hydrologic cycle- elements of hydrologic cycle: evaporation, transpiration, evapotranspiration, precipitation. Energy transformation.

**Unit-II**

Soil moisture, infiltration- process, causes and subsurface structures, porosity-classification of porosity: igneous, sedimentary and metamorphic rock porosity, permeability, hydraulic conductivity- definition- Darcy's law.

**Unit-III**

Groundwater hydrology-water table-vertical distribution, subsurface movement, aquifer systems-types of aquifer: confined, unconfined, semiunconfined, specific yield-storage-transmissivity, well hydraulics, pump test-methods-analysis.

**Unit-IV**

Groundwater flow-introduction, hydraulic head-definition, variable density-specific discharge-introduction, types: steady, unsteady and radial flow- flow lines, runoff- flow estimation, various stages of runoff, surface water evaporation.

**Unit-V**

Applied hydrogeology- coastal aquifers and seawater intrusion, groundwater quality and health impacts, role of hydrogeology for hill slope stability-introduction-process and hydrogeological modelling, groundwater exploration, well construction.

**Groundwater Geology Practical**

Lab: Calculation - numerical model for groundwater flow including flow direction and dynamics, well head. Groundwater quality- modelling.

**TEXT BOOKS/ REFERENCES:**


1. Reddy P J R., (2016). A text book of Hydrology, (third edition). Firewall Media.
2. Raghunath H M., (2006). Hydrology: principles, analysis and design. New Age International.
3. Sharma R K., Sharma T K., (2004). A Textbook of Hydrology and Water Resources Engineering. Dhanpat Rai Publications.