

## **Module Title: Engineering Hydrology & Hydrogeology**

### **Elective Module**

#### **Content:**

1. Introduction to Hydrology
  - Physical & Chemical Properties of Water
  - The Hydrological Cycle
  - The development and application of Hydrology
2. Hydrological Processes
  - Surface Water & Streamflow Sources
  - Catchment Modelling & Rainfall Runoff Analysis
  - Evapotranspiration & Evaporation Measurement
  - Runoff modeling and Risk Analysis
3. Hydrological Analysis
  - Water Balance & Budget
  - Flow Measurement & Data Processing
  - Unit Hydrograph & Hydrograph Analysis
  - Stage Discharge Relationship
  - Flow Routing
  - Hydrological Statistics and Frequency Analysis
4. Flood Risk Management
  - Flood Risk Policy and International Best Practice
  - Design Storms
  - Implications for Domestic Development, Arterial Drainage Act, 1945 (and 95 Amendment). OPW' 2005 Flood Policy Review and related legislation.
5. Hydrogeology
  - Groundwater Resources and Aquifer vulnerability
  - Sources and Pathways to Aquifer Pollution
  - Land use and risk management
  - Confined and Unconfined Aquifers
  - Aquifer exploitation and Safe Yield
  - Coastal Aquifers and Saline Intrusion
  - Hydrocarbon Pollution and Remediation
6. Legislation
  - Water Framework Directive & Other Relevant EU Directives
  - Roles of the various public bodies in Ireland