

ESSENTIALS OF SOIL PHYSICS AND SURFACE HYDROLOGY

- Hydrological cycle
- Land-Atmosphere fluxes
- Precipitation: formation, types (convective, stratiform), hydrometeors, estimation (in-situ, remote sensing etc)
- Evapotranspiration: measurements (in-situ, remote sensing) and modeling, surface energy balance
- Vadose (or unsaturated) zone hydrology: Soil properties and water movement: hydraulic parameters and measurements, soil texture classes, infiltration (Richards equation, Green Ampt etc) soil water content (moisture retention curve, matric potential, measurements of soil moisture, characteristic parameters of water content in soil)
- Saturated zone hydrology: Saturated water flow in soils (Darcy's law)
- Runoff generation and river flow
- River basin (definition, method for delineation, hillslope/channel elements etc)
- Runoff generation mechanisms (infiltration excess, saturation excess etc)
- Runoff routing (overland and channel)
- Flood hydrograph (unit hydrograph theory, estimation techniques)
- Analysis of hydrologic time series (flow duration curves, flood frequency analysis)