### COURSE OVERVIEW

This course examines the basic physical processes that govern the supply and movement of surface waters. Students will develop a thorough understanding of how surface water conditions (snow, rain, soil pore waters, groundwater, and surface runoff) vary with space and time, and how these hydrological reservoirs are influenced by the climatic regimes, soils, and lithology. The course examines how hydrological processes are investigated and quantified, using the watershed as the basic unit for understanding these processes. The course begins with an overview of basic concepts (properties of water, and key physical quantities and laws) examination of atmospheric water (precipitation and evaporation) and the generation and flow of surface waters within the watershed (infiltration, groundwater, and runoff generation). Students learn how the climatic, geomorphic, geologic and biologic properties of the near surface regulate weathering and surface water movement. Practical written assignments focus on hydrological measurements and hydrological data analysis and problem solving. Field and laboratory exercises emphasise hydrological monitoring techniques and methods used to quantify and model the movement of water to and within watersheds.

### LEARNING OUTCOMES

- To explain the physical processes that govern the movement of surface water within a watershed, and the temporal and spatial variability of these processes
- To learn methods used to measure inputs and outputs of water in physical hydrological investigations
- To explore and apply analytical and data handling techniques to understand the water storage, and transfer of water within watersheds.

### COURSE TOPICS

Introductory concepts including; the properties of water, the watershed, water balance, global climate and hydrology. Processes governing precipitation and evaporation, and techniques for measuring precipitation and evaporation, including snow and snowmelt hydrology. Processes governing and quantification of 1) infiltration and redistribution of soil water; 2) groundwater flow, 3) surface water flow and runoff generation; 4) hydrograph analysis.

### SELECTED COURSE TEXTS & READINGS