Course Name:

Hydraulic

Course Number: 20-611	**Credit:** 3
Program: Undergraduate	**Course Type:** Technical required
Prerequisite: Fluid Mechanics	**Corequisite:** -

Course Description (Objectives):
The purpose of this course is to present the basics of open channel hydraulics and familiarize the undergraduate students in civil engineering with theoretical and experimental methods in hydraulics. The course will expose the students to practical applications from canals to rivers and teach them how to formulate an open channel hydraulics problem and apply the basic laws of conservation of mass, momentum, and energy to come up with an understanding of the fundamental processes.

Course Content (outline):

- Review of principles of fluid mechanics: concepts, conservations of mass, momentum, and energy
- Applications of energy equation: specific energy, flow over sill and through contraction, critical flow, control sections, flow through bridge piers, chocking, non-rectangular channels
- Applications of Momentum equation: hydraulic jump, specific momentum, surge in channels
- Friction flow: uniform –flow in channels, Chezy and Manning equations
- Uniform flow, gradually-varied flow, flow classification, combinations of flows, two-lake problem, numerical method
- Unsteady flow: derivation of basic equations, solution of Saint-Venant equations, characteristic method, flow in tidal rivers, dam break

References:

- Open Channel Hydraulics, T. W. Sturm, 2nd edition, McGraw-Hill, 2010.
- Open Channel Flow, F. M. Henderson, Macmillan Pub. Co., 1966.