Department of Civil Engineering

Course Name:

Urban Hydrology and Hydraulics

Course Number:	**Credit:** 3
Program: Joint course	**Course Type:** Optional
Prerequisite: Hydraulics	**Corequisite:** -

Course Description (Objectives):

The main objectives of the course are as follows:

1. To discuss the current challenges in urban drainage and sewerage systems posed by fast growing urbanization.
2. To understand the fundamental concepts and processes associated with hydrology, hydraulics and water quality of urban stormwater.
3. To understand the basics of the design of urban drainage systems.
4. To simulate and design an urban drainage system using a modeling tool.

Course Content (outline):

- Introduction: scope of urban hydrology and hydraulics
- Overview: rainfall for designing urban drainage system
- Overview: Rainfall excess calculations
- Overview: Open-channel flow in urban watersheds
- Overview: calculation of runoff rates from urban watersheds
- Design of stormwater drainage structures
- Stormwater management using detention basins
- Urban stormwater quality modeling
- Best Management Practices and low impact development (LID) measures for urban stormwater control
- Modelling tools (computer applications) of urban drainage systems: SWMM
- Introduction to other modeling tools for urban drainage system: StormCAD
- Project: designing a simple drainage system using a modeling software.

References:

- Akan, A. O. and Houghtalen, R. J. (2003). Urban hydrology, hydraulics, and stormwater quality: engineering applications and computer modeling. John Wiley & Sons.
- Novák, P., Moffat, A. I. B., Nalluri, C. and Narayanan, R. A. I. B. Hydraulic Structures. CRC Press, 2017.
- سازمان برنامه و بودجه، مبانی و ضوابط طراحی شبکه های جمع آوری آب های سطحی و فاضلاب شهری، بازنگری نشریه های شماره ۳ - ۱۱۸ و ۱۶۳