

CIVIL WATER RESOURCES (CWR)

CWR 3201C - Engineering Fluid Mechanics (3 Credits)

Fundamentals of fluid mechanics; properties of fluids, hydrostatics; Bernoulli principle; conservation of mass, momentum and energy in fluid flow; laminar and turbulent pipe flow; similitude and dimensional analysis; and flow measurements; laboratory.

Prerequisite(s): MAP 2302 and EGM 3420C and (PHY 2049C or (PHY 2049 and PHY 2049L))

CWR 3202C - Hydrology and Hydraulics (3 Credits)

This course studies both hydrology, which is the study of occurrence, movement and distribution of rainfall, and hydraulic design, which is the application of fluid mechanics and other science and engineering disciplines in the design of structures and development of water resources. Hydrologic principles are applied to model and analyze the distribution and movement of rainfall in a watershed. Hydraulic principles are applied to analyze and design flow through systems of reservoirs and channels . The course makes use of computer simulation models used in engineering practice.

Prerequisite(s): CWR 3201C

Attribute(s): SUSC - Sustainability Component

CWR 4540C - Water Resources Design (3 Credits)

Application of fluid mechanics, hydraulics and hydrology in water, wastewater, and stormwater system design and watershed management. Distribution and collection networks, treatment plant hydraulics, retention pond and reservoir design, outlet and control structures, and stormwater best management practices. Water supply, flood routing, and water quality management, including urban watersheds, groundwater transport. Several design projects using local and state regulations.

Prerequisite(s): CWR 3202C

Attribute(s): SUSC - Sustainability Component

CWR 6125C - Groundwater Hydrology (3 Credits)

Covers the fundamental principles of groundwater flow and solute transport. Introduction to the water balance and groundwater hydraulics. Aquifer types and properties. Design and analysis of aquifer tests to determine hydraulic coefficients. Geology of aquifer systems. Introduction to the mass transport equations.

CWR 6532 - Urban Water Modeling (3 Credits)

Comprehensive introduction to modeling water flow in an urban environment. The course uses an interdisciplinary approach that encompasses urban water management, management of ecosystem services and urban/landscape design.

CWR 6537 - Contaminant Transport (3 Credits)

The examination of physical-chemical-biological concepts and modeling of retention and transport of water and solutes in unsaturated and saturated media. Applications to environmental aspects of soil and groundwater contamination are emphasized.

CWR 6637 - Storm Water Mgmt and Modeling (3 Credits)

Principles governing the transport and fate of contaminants in surface water systems. Water quality standards, wastewater inputs, water quality modeling for water-borne disease, dissolved oxygen, and toxic chemicals. Engineering controls to meet water quality objectives and case studies are presented.