Water Resources Engineering Division

Course Syllabus

CEW601 (Hydrology)

The hydrological cycle, atmospheric water, precipitation and its measurements, evaporation and its measurements, hydrographs and unit hydrographs, stream gauging, subsurface water.

CEW 602 (Hydraulics)

Fluid properties, flow concepts, pipe flow, open channel flow, canal delivery, pumps - pipelines analysis, hydrostatic of fluids

CEW 603 (Water Supply Engineering)

Population estimation, water quantity and quality, water microbiology, sedimentation, chemical treatment, disinfection, water chemistry

CEW 604 (Groundwater Hydrology)

Introduction to hydrogeology, groundwater movements, groundwater flow equations, analytical solutions, well hydraulics, flow nets, well-image theory.

CEW 605 (Hydraulic Structures)

Discharge measurement devices, types of dams, design of gravity dams, design of earth dams, seepage, spillway design, highway drainage systems

CEW 606 (Wastewater Treatment)

Wastewater quantities, wastewater characteristics, effects of discharges to environment, physical processes, chemical processes, biological processes, residue production and treatment, design of sludge collection, storage, treatment and disposal

CEW 607 (Flow and Transport in Porous Media)

Introduction to algebra, laminar flow, hydraulic conductivity, groundwater equations (numerical solutions), flow-net, statistical moments, flow in unsaturated zone, transport problems.

CEW 608 (Groundwater Assessment)

Assessing natural recharge and discharge, test pumping analysis, aquifer parameter estimations, groundwater protection, stream aquifer interaction, subsidence due to groundwater withdrawal, recovery tests, step-drawdown tests, assessing contaminated land, groundwater geophysics.

CEW 609 (Solid Waste Management)

Definitions, fate and transport, toxicology, generation and collection, waste handling, separation, storage and processing, land filling of wastes, design, operation, leachate production and treatment, gas production and utilisation, clinical waste, sources, characteristics, treatment and disposal, case study.

CEW 610 (Groundwater Engineering Design & Construction)

Introduction to hydrogeology, groundwater exploitation, well drilling and sampling, water well design and construction, economic well design, well maintenance and rehabilitation, groundwater pumping, monitoring and remediation, dewatering, artificial recharge.

CEW 611 (Groundwater Modelling)

Overview of groundwater modelling practice, conceptual and mathematical model development, numerical methods and the components of numerical models, flow modelling, transport modelling.

CEW 612 (Environmental Impact Assessment)

Assessment of impacts, prediction and assessment techniques, case studies (over-exploitation of water resources, wastewater disposal systems, solid waste disposal systems)

CEW 613 (Irrigation and Drainage)

Soil water plant relations, measurement of soil moisture, crop water use, salinity problems in soil and water, irrigation efficiencies, irrigation systems, drainage problems.

CEW 614 (Water Resources Systems)

Introduction to optimisation, development and application of linear and dynamic programming methods, conservation of water resources, multi-purpose project planning

CEW 697 (Special Topics in Water Resources)

The syllabus of each course will be announced in details when the course is offered.

CEW 698 (Water Engineering Seminar) (1-credit)

Course designed to provide skills in thesis writing, paper writing, presentation, posters.

CEW 699 (Thesis Project) (6-credits)

A research project must be carried out after completing the required courses.