COURSE DETAIL

WASTEWATER MANAGEMENT
Country Italy
Host Institution University of Bologna
Program(s) University of Bologna
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Environmental Studies Engineering Civil Engineering
UCEAP Course Number 183
UCEAP Course Suffix
UCEAP Official Title WASTEWATER MANAGEMENT
UCEAP Transcript Title WASTEWATER MNGMT
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description

This course is part of the Laurea Magistrale program. The course is intended for advanced level students only. Enrollment is by consent of the instructor. The course focuses on the location and design of wastewater treatment plants together with main rules of outfall discipline. Special attention is placed on the preliminary designs for main urban wastewater treatment plants and their outfall effects on water volumes. The course is split into three parts. Part one discusses wastewater; sewage characteristics; technical laws; industrial, agriculture, and domestic discharge; Hygiene Municipal Regulation; water outfall discipline; wastewater reuse regulations; variations in flowrate and characteristics of domestic and industrial wastewater; and treatability in rainy weather conditions. Part two discusses wastewater treatment: Kinetics and biochemistry of bacterial and algal biomass; growth and death in suspended and attached biomasses; septic tanks and Imhoff tanks design; the project of a full-scale domestic wastewater treatment plant operating in steady state; choice and location; raw and fine screens; sand removal; primary sedimentation; biodegradability and biological phases for secondary treatment; secondary sedimentation; active sludge plants upgrading to obtain phosphorous and nitrogen removal; separate scheme; Wuhrmann scheme; Ludzack-Ettinger scheme; Bardenpho scheme; A2/O process; Phoredox process; trickling filters; granular settling biofilters; wastewater disinfection; treatment and disposal of sludge; active sludge models.; sequencing batch reactors; natural system design for wastewater treatment or finishing; biological ponds. FWS and SFS phytotreatment; “on site” treatment for domestic wastewater coming from small communities; building and managing costs; and functional test. The third part of the course discusses outfalls in water volumes: water volumes protection and sanitary reclamation plans; wastewater discharge in rivers; effects of natural and domestic organic loadings on low exchange basin; ocean and river disposal of treated and untreated wastewater; offshore pipes.; diffusers; and aquatic ecosystem modeling criteria. The course includes lectures and practical exercises. The exercises focus on different real-scale biologic wastewater treatment plant projects based on attached and suspended biomass and natural appropriate treatment systems. The course requires students to have basic

understanding of hydraulics and chemistry as well as a basic course in environmental sanitation engineering as a prerequisite.

Language(s) of Instruction
Italian

Host Institution Course Number
73256

Host Institution Course Title
WASTEWATER MANAGEMENT

Host Institution Campus
BOLOGNA

Host Institution Faculty
ENGINEERING

Host Institution Degree
LM in Environmental engineering

Host Institution Department
ENVIRONMENTAL ENGINEERING

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