

UNIVERSITA' DEGLI STUDI MEDITERRANEA DI REGGIO CALABRIA

Subject Code	-----
Subject Name	Sanitary Environmental Engineering
Professor	Paolo S. Calabrò
Department:	Civil, Energy, Environmental, Materials Engineering
Degree course:	B.Sc. in Civil – Environmental Engineering, M. Sc. in Civil Engineering
Class:	L/7, LM/23
Type of educational activity:	Fundamental, Complementary
Disciplinary Area:	Environmental Engineering
Scientific-Disciplinary Sector:	Sanitary Environmental Engineering ICAR/03
Compulsory preliminary exams:	Chemistry, Hydraulics
Course Year:	III, II
Semester:	II
ECTS:	6
Hours:	48

Synthetic description:

The aim of the program is to give the basic notions to approach the design of treatment plants with particular reference to municipal wastewater treatment plants.

Acquisition of knowledge on:

Definition of pollution, its effects and the strategies for its control.

Mass balances. Basics on microbiology.

Knowledge on Italian Regulations on wastewater treatment.

Knowledge on the characteristics of municipal wastewater and on the design of chemical, physical and biologic unit operations for municipal wastewater and sludge.

Evaluation method:

Oral exam

Student's independent work

A project work carried out alone or in group is required.

Detailed course program

Introduction to Sanitary environmental engineering.

Pollution definition. Strategies for pollution control. Mass balances. Reactors (batch, completely mixed, plug-flow). Basics on microbiology.

Municipal wastewater treatment plants

Regulations on wastewater treatment plants. Characteristics of municipal wastewater (dry weather and wet weather, quantity and quality).

Wastewater treatment plants schemes. The design of chemical and physical unit operations for municipal wastewater (screening, grease and grit removal, clarification, disinfection)

Activated sludge treatment: concepts and plant design approach. Nitrification.

Wastewater treatment sludge: characteristics and treatment unit operations.

Resources and main references

Luca Bonomo. Trattamenti delle acque reflue. McGraw-Hill.

George Tchobanoglous, Franklin Louis Burton, H. David Stensel. Wastewater Engineering: Treatment and Reuse. McGraw-Hill Professional, 2003.

Metcalf & Eddy . Ingegneria delle acque reflue, trattamento e riuso. McGraw-Hill.