



COURSE: Sanitary-Environmental Engineering

TEACHER: PROF. ETTORE TRULLI

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website:

Language: ITALIAN

ECTS: 9

n. of hours: 90

Academic year: 2014-2015

Campus: Matera

Semester: I, II

TOPICS

The course, on the base of the knowledge of principles for the rational use of environmental sources (water, soil, air), examines the theory of process focusing the application of engineering technologies for environmental pollution control of water and waste. The insights concerning health are related to the study of the parameters of microbiological pollution, the techniques of disinfection, water, waste management, health checks of plants.

TEACHING METHODS

X Theoretical lessons

X Tutorials in classroom

Tutorials in laboratory

Project works

X Technical visits

Other activities _____

TEXTBOOKS

Notes provided by the lecturer. The teacher also recommends books, handbooks and journals of technical and scientific content on topics of interest for topics.

ON-LINE EDUCATIONAL MATERIAL

web address: _____

LEARNING OUTCOMES

Knowledge of issues related to integrated water cycle and the management of municipal solid waste and engineering technologies for the treatment and disposal. Analysis of pollution source in environmental compartments (water, soil, air). Knowledge of the parameters for the characterization of water pollution and waste. Acquisition of the theoretical foundations of the main engineering techniques for the treatment of water and wastewater and waste. Acquisition of basic knowledge on the kinetics of the reactions. Criteria for the analysis of the mass balances of the systems.

REQUIREMENTS

Chemistry

EVALUATION METHODS

Intermediate verifications

Written examination

X Discussion of a project work

Practical test

X Oral examination

Other methods _____

DETAILED CONTENT

Pollution of the natural environment. Pollution parameters and characterization of environmental sources: water, soil, air. Protection of nature. Study of the diffusion of pollutants and pollution control techniques

Control of water quality. Characters physical-chemical water. Natural water cycle. Sources and effects of water pollution. The bio-geochemical cycles.

Legislative aspects on water use and water pollution.

Parameter characterization of wastewater and sewage sludge.

Theory of reactors. Stoichiometry and kinetics of the reactions.

Water treatments. Sedimentation. Flotation. Filtration. Chemical and physical processes. Chemical precipitation.

Coagulation and flocculation. Disinfection. Gas transfer.



Biological processes. Knowledge of microbiology. Aerobic biological treatment. Anoxic biological treatment. Kinetics of biological process; Activated sludge reactors. Aerobic biological treatment. Anaerobic biological treatment. Suspended and attached biomass reactors.

Production and characteristics of sewage sludge. Treatment processes and disposal of sludge. Disposal of sludge. The integrated cycle of municipal solid waste management.

The legislation in the field of treatment and disposal of solid waste.

Waste classification. Production and characteristics of municipal solid waste.

The separate collection, recycling and recovery of materials.

Disposal of solid waste in sanitary landfill. The incineration of solid waste.

The Composting. The Anaerobic Digestion. Pyrolysis and Gasification. The processing of biomass.

SEMINARS BY EXTERNAL EXPERTS YES X NO

FURTHER INFORMATION
