UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2016/2017
BACHELOR'S DEGREE (BSC)	ENVIRONMENTAL ENGINEERING
SUBJECT	MANAGEMENT OF SANITARY AND ENVIRONMENTAL SYSTEMS
TYPE OF EDUCATIONAL ACTIVITY	C
AMBIT	10653-Attività formative affini o integrative
CODE	18086
SCIENTIFIC SECTOR(S)	ICAR/03
HEAD PROFESSOR(S)	TORREGROSSA MICHELE Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54
PROPAEDEUTICAL SUBJECTS	03981 - SANITARY AND ENVIRONMENTAL ENGINEERING
MUTUALIZATION	
YEAR	3
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**TORREGROSSA MICHELE** Monday 12:00 13:00 Ufficio del docente. Piano II, Area Idraulica-Ambientale del Dipartimento DICAM Tuesday 9:30 11:00 Ufficio del docente. Piano II, Area Idraulica-Ambientale del Dipartimento DICAM Wednesday 12:00 13:00 Ufficio del docente. Piano II, Area Idraulica-Ambientale del Dipartimento DICAM Thursday 9:30 11:00 Ufficio del docente. Piano II, Area Idraulica-Ambientale del Dipartimento DICAM

DOCENTE: Prof. MICHELE TORREGROSSA

PREREQUISITES	Sanitary and Environmental Engineering. Sanitary and environmental treatment plants. Hydraulic.
LEARNING OUTCOMES	Knowledge and understanding: At the end of the course the student will have knowledge of the problems concerning the fields of application of the correct management of the treatment plants to supply water and waste techniques as well as the main types of plants for the treatment and disposal of solid waste. Applying knowledge and understanding: The student will have acquired the ability to apply methods and techniques of management and use of the most advanced technologies for the purification of domestic and industrial wastewater and supply water. It will also have had the opportunity to also check in situ techniques of management of solid waste disposal facilities. Making judgements: The student will have acquired the capacity to choose the most appropriate management pathways for the purpose of a correct and economical operation of the plants. Communication skills: The student will acquire the ability to communicate and express himself on issues concerning the object of the course. He will be able to support meetings and debates on major management issues of water treatment plants and waste as well as some technical procedures for the achievement of the objectives required by the regulations during operation of the plant. Learning skills: The student will have learned how management services for the consolidated and advanced technologies. It will also have the awareness and ability to adopt flexible and possibly modifiable solutions, adopting management criteria and operating in an appropriate manner in relation to the characteristics of the flows to be treated and the operating conditions of the system.
ASSESSMENT METHODS	Oral test
EDUCATIONAL OBJECTIVES	Course objective is investigate major issues connected with the management and operation of water treatment plants (destined for human consumption and wastewater) as well as on the treatment and disposal of municipal solid waste. In particular the issues of the monitoring process will be discussed, the dysfunctions and the organizational and economic aspects associated with the correct plant management activities. Each topic will be tackled starting from a description of the subject, then moved to the context analysis and the operating conditions, reaching the exposure of best management criteria and, finally, having a direct comparison with sector operators. Within the course technical visits treatment plants will be carried out, in order to allow students direct learning in the field of the issues addressed.
TEACHING METHODS	Lectures, tutorials, seminars and technical visits.
SUGGESTED BIBLIOGRAPHY	- Dispense e materiale bibliografico distribuiti durante il corso; - Collivignarelli C., Riganti V., Pergetti M (2000). La gestione degli impianti di depurazione delle acque di scarico. Ed. Il Sole 24 ore, Milano; - Bianchi A., Sanfilippo U. (2005). Pompe e impianti di sollevamento. Ed. Hoepli

SYLLABUS

Hrs	Frontal teaching
1	Introduction to the course.
2	Management of water treatment systems: sampling: legislation, methods, materials
2	Management of wastewater treatment plants: process monitoring
4	Management of wastewater treatment plants: process instrumentation; measurements of process parameters and flow measurements
2	Management of wastewater treatment plants: cycles and automatic controls in wastewater treatment plants
6	Management of wastewater treatment plants: process dysfunctions in biological activated sludge treatment plants; prevention and treatment systems
2	Management of wastewater treatment plants: the pumping stations
2	Management of wastewater treatment plants: excess sludge conditioning and dewatering
1	Management of wastewater treatment plants: the management structures of the treatment plants
2	Management of wastewater treatment plants: operating costs
2	Management of treatment / disposal facilities MSW: setting MSW management system; flowcharts and balances of materials
2	Management of treatment / disposal facilities RU: problems of management of biowaste composting plants
2	Management of treatment / disposal facilities RU: management of selection and recovery facilities of the dry MSW (paper, cardboard, plastic and metal)

SYLLABUS

Hrs	Frontal teaching
2	Management of treatment / disposal facilities RU: management of mechanical biological treatment plants (MBT) of MSW
2	Management of treatment / disposal facilities RU: management of sanitary landfills
2	Management of treatment / disposal facilities RU: problems related to the recovery of biogas from sanitary landfills

Hrs	Practice
12	Tutorials on various applications the course topics

Hrs	Others
6	Seminars with qualified operators / managers of wastewater treatment plants and MSW treatment and disposal