



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali		
ACADEMIC YEAR	2017/2018		
MASTER'S DEGREE (MSC)	FORESTRY AND AGRO-ENVIRONMENTAL SCIENCE AND TECHNOLOGY		
SUBJECT	FOREST AND ENVIRONMENTAL MICROBIOLOGY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50564-Discipline forestali ed ambientali		
CODE	18456		
SCIENTIFIC SECTOR(S)	AGR/16		
HEAD PROFESSOR(S)	SETTANNI LUCA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	90		
COURSE ACTIVITY (Hrs)	60		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	SETTANNI LUCA Wednesday 11:00 - 13:00 Dipartimento Scienze Agrarie, Alimentari e Forestali, Edificio 5, Ingresso A. I giorni e gli orari indicati per il ricevimento sono relativi al periodo in cui sono svolte le lezioni. Gli incontri si possono concordare via email o telefonica negli altri periodi.		

DOCENTE: Prof. LUCA SETTANNI

PREREQUISITES	General knowledge of biology
LEARNING OUTCOMES	<ul style="list-style-type: none"> - Knowledge and ability to understand. Acquisition of advanced tools for Microbiological understanding and evaluation. Ability to use the specific technical language. - Ability to apply knowledge and understanding. Ability to assess the needs of the microbial communities of the natural environments. - Making judgements. To be able to evaluate the implications and results of the microbiological studies performed. In the light of the knowledge acquired, to interpret the determining factors in the microbial ecosystems. To be able to act specifically to prevent or limit the imbalances or the irreversible changes in the relationships between the microbial populations of a given environment. - Communication abilities. Ability to expose the mechanisms of microbial interactions to laboratory technicians, and the results of the analysis also to a non-expert public. To be able to apply a suitable synthetic and technical language to communicate problems and to suggest useful solutions. - Learning skills. To acquire the ability to identify the biological aspects relevant for the forest sector and to suggest intervention solutions with modern techniques and methodologies through continuous updates and scientific consultations.
ASSESSMENT METHODS	The oral test consists of an interview to ascertain the skills and disciplinary knowledge provided by the course; the evaluation is expressed in thirtieths. The questions will verify a) the knowledge acquired through the ability to establish connections among the different topics of the course, b) the processing abilities through the comprehension of the applications or their implications within the course, c) the reaching of presentation/speaking skills through the demonstration of a given appropriate technical language within the professional context.
EDUCATIONAL OBJECTIVES	The course aims to provide the basis of general microbiology, aimed at environmental and forestry sector, through the study of the morphology, physiology, genetics and microbial taxonomy and understanding of biogeochemical cycles and functional microbial groups involved in the main degradation processes of organic matter. The course, through laboratory sessions, aims to provide the student manual skills necessary to start working in a microbiology laboratory and to perform quantitative and qualitative analyses of environmental and forest samples.
TEACHING METHODS	The course includes 45 hours of lecture and 15 hours of laboratory sessions
SUGGESTED BIBLIOGRAPHY	<p>Willey M., Sherwood M., Woolverton J. (2009) PRESCOTT 1, Microbiologia Generale, McGraw-Hill</p> <p>Willey M., Sherwood M., Woolverton J. (2009) PRESCOTT 2, Microbiologia Sistemica, Ambientale, Industriale, McGraw-Hill</p>

SYLLABUS

Hrs	Frontal teaching
1	History of microbiology
1	Staining of microorganisms
1	Bacterial morphologies
8	Structure and functions of prokaryotic cell: plasma membrane; cytoplasm; cellular inclusions; ribosomes; nucleoid; plasmids; cell wall; bacterial toxins; protein secretion; structures external to the cell wall; microbial biofilms; pili, fimbriae and flagella and cell mobility; endospore
1	Chemotaxis and phototaxis
4	Microbial nutrition; nutrient requirements; transport systems; culture media
1	Pure culture technique and colony morphologies
5	Prokaryotic cell cycle; microbial growth kinetics; growth curve; estimation of growth by direct and indirect methods
1	Continuous cultures
5	Environmental factors affecting the growth of microorganisms: activity water; pH; temperature; oxygen; pressure; radiations
1	Microbial growth in natural environments
3	Methods for the control of microorganisms; the rate of microbial death; measurements of antimicrobial activity
5	Microbial metabolism: aerobic respiration; anaerobic respiration; fermentation
2	Introduction to the microbial ecology of biogeochemical cycles
2	Microorganisms in water environments
4	Microbial communities in terrestrial environments
Hrs	Practice
15	Analyses of agro-forest samples, plate counts, isolation of microorganisms, morphological analysis and grouping of isolates, physiological and biochemical characterization of the main microorganisms

