

COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	APPLIED BIOLOGY AND BIOTECHNOLOGY		
DEPARTMENT	BIOTECHNOLOGY		
STUDY LEVEL	Undergraduate		
COURSE CODE	1280	SEMESTER	2 nd
COURSE TITLE	GENERAL MICROBIOLOGY		
INDEPENDENT TEACHING ACTIVITIES <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	ECTS
Lectures		3	1,56
Laboratory Exercises		2	1,04
			1,40
TOTAL			4,00
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special Background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/EFP140/		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

APPENDIX A

- Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.
- Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and

APPENDIX B

- Guidelines for writing Learning Outcomes

General Microbiology is a basic course for understanding the diversity, cellular structure, function and phylogeny of microorganisms. It is the foundation for taking higher level microbiology-related courses in various Departments of the AUA, such as Plant Pathology, Food Safety and Technology, Food Microbiology, Soil Microbiology, Microbial Biotechnology, various courses on agricultural and non-agricultural waste treatment and bioremediation.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

*Search for, analysis and synthesis of data and information by the use of appropriate technologies,
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Working in an international environment
Working in an interdisciplinary environment
Introduction of innovative research*

*Project planning and management
Respect for diversity and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and sensitivity to gender issues
Critical thinking
Development of free, creative and inductive thinking
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(Other.....citizenship, spiritual freedom, social awareness, altruism etc.)
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- Data research, analysis and synthesis
- Decision making
- Individual work
- Environmental awareness
- Basic understanding of living organisms
- Offer constructive criticism and self-criticism
- Development of free, creative and inductive thinking
- Development of scientific thinking

3. COURSE CONTENT

LECTURES

Microbes and Microbiology

History of microbiological discoveries

Overview of microbial life

Cell structure and function

- Structure of the cytoplasmic membrane in bacteria and archaea
- Cell walls of bacteria and Archaea
- Flagella and other cellular parts and organelles

Microbial nutrition and laboratory culture

Microbial growth

- The process of microbial cell division
- Temperature and microbial growth

Principles of microbial metabolism

Introduction to virology

- Viruses
- Classification of viruses
- Viruses of bacteria, plants and animals

Microbial evolution and systematics

- Microbial fossils
- RNA-based life
- The ecumenical tree of life

Microbial diversity: Bacteria

- Overview of bacteria
- Proteobacteria
- Gram-positive bacteria
- Cyanobacteria and prochlorophytes
- Chlamydia
- Stalked bacteria
- Flavobacteria
- Spirochetes
- Deinococci
- Green sulfur bacteria

- Hyperthermophilic bacteria

Microbial diversity: Archaea

- Phylogeny and metabolism
- Euryarchaeota
- Crenarchaeota

Biology of the eukaryotic cell and eukaryotic microorganisms

Introduction to mycology

- Introduction to fungi, economic significance
- Taxonomy and phylogeny of fungi
- Fungal morphology and physiology (I) and (II)
- Reproduction and life cycles of fungi
- Chytridiomycota, Mucoromycota, Glomeromycota
- Ascomycota
- Lichens, Basidiomycota (I), Basidiomycota (II)
- Mitosporic fungi and parasexual cycle

Oomycota and Myxomycota

LABORATORY EXERCISES

- Basic laboratory techniques in Microbiology: Isolation, culture and microscopic observation of microorganisms
- Bacteria (Gram stain and morphology)
- Photosynthetic microorganisms (prokaryotic and eukaryotic), Mucoromycota (asexual and sexual fruiting bodies)
- Ascomycota (asexual reproduction) and yeasts
- Ascomycota (sexual reproduction), Basidiomycota

4. TEACHING and LEARNING METHODS - EVALUATION

TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i>	In-class lectures		
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of slide presentation and blackboard. Communication with students. Learning process support by access to e-class asynchronous distance learning platform.		
TEACHING ORGANISATION <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>		Activity/ Method	Semester workload
		Lectures	39 hours
		Laboratory practice	26 hours
		Individual laboratory project (data processing and commenting)	
		Personal study	35 hours
		Total of Course (25 hours of workload per ECTS)	100 hours

STUDENT EVALUATION <i>Detailed description of the evaluation procedures:</i> <i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work,</i>	I. One or two midterm tests during the course of the semester. They are optional for the students. The midterm test grade counts as a bonus on the final exam's grade. II. A final exam which includes questions requiring a short analysis. The questions are designed to evaluate basic knowledge of Microbiology and familiarization with the biology and applications of microorganisms
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<p><i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i></p>	<p><i>other.....etc.</i></p> <p>related to Agriculture.</p> <p>III. A written exam on the laboratory exercises. Students are required to identify microorganisms presented during the laboratory exercises and justify their identification.</p>
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5. SUGGESTED BIBLIOGRAPHY:

- Brock, Biology of Microorganisms (2nd edition), Crete University Press (2018).
- Introduction to Mycology. Class notes by Professor Georgios Zervakis (2019)
- Laboratory exercise material available at the e-class website of the course