

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>ACADEMIC UNIT</b>	AGRICULTURE		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	AGR_300	<b>SEMESTER OF STUDIES</b>	THIRD
<b>COURSE TITLE</b>	Principles Of Microbiology		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
Lectures		3	
Laboratory exercises		2	
<b>Total</b>		5	5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Mandatory, general background		
<b>PREREQUISITE COURSES:</b>	Typically, there are no prerequisite courses.		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek. Teaching may be performed in English in case foreign students attend the course.		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBPAGE (URL)</b>			

### 2. LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>		
<p>The course "Principles of Microbiology" is a general background course to help understanding of the diversity, organization, cell structure, function and phylogenetics of microorganisms, as well as the management of microorganisms to reduce their negative and increase their beneficial effects in agriculture and the environment in general. It provides important knowledge for advanced courses regarding plant pathogens, microorganisms affecting plant nutrition and growth, beneficial microorganisms for organic farming, microorganisms related to food processing and safety, waste treatment and environmental rehabilitation.</p>		
<p><b>General Competences</b></p> <p><i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>  <i>Adapting to new situations</i>  <i>Decision-making</i>  <i>Working independently</i>  <i>Team work</i> </td> <td style="width: 50%; border: none;"> <i>Project planning and management</i>  <i>Respect for difference and multiculturalism</i>  <i>Respect for the natural environment</i>  <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>  <i>Criticism and self-criticism</i>  <i>Production of free, creative and inductive thinking</i> </td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i>
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i>	

<i>Working in an international environment</i>	.....
<i>Working in an interdisciplinary environment</i>	<i>Others...</i>
<i>Production of new research ideas</i>	.....

Generally, by the end of this course the student will, furthermore, have developed the following general abilities (from the list above):

*Searching, analysis and synthesis of facts and information, as well as using the necessary technologies*  
*Decision making*  
*Autonomous (Independent) work*  
*Respect for the Environment*  
*Criticism and self-criticism*  
*Promotion of free, creative and inductive thinking*

### 3. SYLLABUS

1. Micro-organisms and microbiology, history of microbiological discoveries, overview of microbial life
2. Cell structure and function
3. Microbial growth
4. Principles of microbial metabolism
5. Principles of microbial molecular biology
6. Introduction to Virology
7. Microbial development and systematics
8. Microbial diversity: Bacteria
9. Microbial diversity: Archaea
10. Eukaryotic micro-organisms, overview and economic importance
11. Morphology and Physiology eukaryotic micro-organisms
12. Reproduction and life cycle of eukaryotic micro-organisms
13. Classification and phylogenetics of eukaryotic micro-organisms

Laboratory exercises:

1. Health and safety in the laboratory.
2. Optical Microscopy.
3. In vitro culture and nutrition of microorganisms
4. Morphology and identification of various species.
5. Identification of asexual and sexual spores and fruiting bodies of microorganisms
6. Gram Staining procedure

### 4. TEACHING AND LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Lectures in class and laboratory exercises in the lab, face to face.	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. The contents of the course of each chapter are uploaded on the internet, in the form of a series of pdf files that the students can freely download using a password which is provided to them at the beginning of the course.	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i>	<b>Δραστηριότητα</b>	<b>Φόρτος Εργασίας Εξαμήνου</b>
<i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational</i>	Lectures (3 conduct hours per week x 13 weeks)	39
	Laboratory work (2 conduct hours per week x 6 weeks)	12
	Hours for private study of the student, preparation and attendance mid-term or/and	74

visits, project, essay writing, artistic creativity, etc.	final examinations.	
	<b>Total number of hours for the Course (25 hours of work-load per ECTS credit)</b>	<b>125 hours (total student work-load)</b>
<p>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</p>		
<p><b>STUDENT PERFORMANCE EVALUATION</b></p> <p><i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ol style="list-style-type: none"> <li>1. One or two mid-term unannounced examinations, during lectures, to reward students who attend lectures continuously and keep up with teaching content. Optional, with bonus degree on the final mark.</li> <li>2. Final mandatory written examination, with full length questions and / or multiple choice questions, as well as questions based on the laboratory work. Minimum pass grade= 5, scale 0-10.</li> <li>3. All the above are taking place in Greek and for foreign students (eg ERASMUS students) in English.</li> </ol>	

## 5. RECOMMENDED LITERATURE

*Suggested bibliography:*

1. Brock Biology of Microorganisms (15th Edition). 2018. Pearson Publishers.
2. Alexopoulos, C.J., Mims, C.W. and Blakwell, M. 1996. Introductory Mycology (4th Edition), J. Wiley & Sons Inc., New York - U.S.A.