

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	Natural Sciences		
<b>ACADEMIC UNIT</b>	Department of Biology		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	<b>BIO_HE14</b>	<b>SEMESTER</b>	<b>6/8</b>
<b>COURSE TITLE</b>	MOLECULAR BIOTECHNOLOGY		
<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>	
	2	3	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Elective, specialty course		
<b>PREREQUISITE COURSES:</b>	None, although basic knowledge of Cellular and Molecular Biology, Biochemistry, Genetics and Microbiology is essential.		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes (in English)		
<b>COURSE WEBSITE (URL)</b>	<a href="https://eclass.upatras.gr/courses/BIO318/">https://eclass.upatras.gr/courses/BIO318/</a>		

### (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>By the end of the semester, students are expected to have been acquainted with the following:</p> <ul style="list-style-type: none"> <li>• emergence of biotechnology as both a scientific discipline and a viable industry,</li> <li>• regulations associated with the pursuit of biotechnology, and</li> <li>• major techniques and applications of this interdisciplinary branch of science.</li> </ul> <p>Emphasis is also placed on careers in this rapidly expanding field, profiles of major projects and researchers, and expansive discussions of bioethical concerns and current research and biotechnological innovations.</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></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"><i>Adapting to new situations</i></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td style="border: none;"><i>Decision-making</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"><i>Working independently</i></td> <td style="border: none;"><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td style="border: none;"><i>Team work</i></td> <td style="border: none;"><i>Criticism and self-criticism</i></td> </tr> <tr> <td style="border: none;"><i>Working in an international environment</i></td> <td style="border: none;"><i>Production of free, creative and inductive thinking</i></td> </tr> <tr> <td style="border: none;"><i>Working in an interdisciplinary environment</i></td> <td style="border: none;"><i>.....</i></td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>
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- Search, analysis and synthesis of data and information, using the appropriate technologies
- Working in a multinational environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Promoting of free, creative and inductive thought

### (3) SYLLABUS

The course is developed based on the following chapters/thematic units:

Chapter 1 - The Emergence of Molecular Biotechnology

Chapter 2 - The Molecular Biotechnology Industry Today

Chapter 3 - Governmental Regulation of Molecular Biotechnology

Chapter 4 - Bioinformatics: Genomics, Proteomics, and Phenomics

Chapter 5 - Industrial Biotechnology

Chapter 6 - Life Sciences and Healthcare

Chapter 7 - Environmental Biotechnology and Conservation

Chapter 8 - Agriculture and Food Production

Chapter 9 - Forensics and Biodefense

Chapter 10 - Evo Devo: The Biotechnology of Evolution and Development

Chapter 11 - The Biotechnology of Anthropology

Chapter 12 - The Future of Biotechnology

Methodology and Implementation of the teaching and pedagogical approach in Molecular Biotechnology.

#### (4) TEACHING and LEARNING METHODS - EVALUATION

<p><b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face													
<p><b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Use of ICT in teaching (PowerPoint slide presentations and use of audiovisual technologies during lectures, complimentary hands-on exercises on computers at the Information Technology Lab of the Biology Department), as well as in the communication with students (through e-mails and via e-Class).													
<p><b>TEACHING METHODS</b> <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></p> <p><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></p>	<table border="1"> <thead> <tr> <th data-bbox="670 530 1045 560"><i>Activity</i></th> <th data-bbox="1046 530 1337 560"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="670 562 1045 591">Lectures</td> <td data-bbox="1046 562 1337 591">22</td> </tr> <tr> <td data-bbox="670 593 1045 656">Hands-on exercises on computers</td> <td data-bbox="1046 593 1337 656">4</td> </tr> <tr> <td data-bbox="670 658 1045 687">Study</td> <td data-bbox="1046 658 1337 687">46</td> </tr> <tr> <td data-bbox="670 689 1045 719">Exam</td> <td data-bbox="1046 689 1337 719">3</td> </tr> <tr> <td data-bbox="670 721 1045 750"><b>Course total</b></td> <td data-bbox="1046 721 1337 750"><b>75</b></td> </tr> </tbody> </table>		<i>Activity</i>	<i>Semester workload</i>	Lectures	22	Hands-on exercises on computers	4	Study	46	Exam	3	<b>Course total</b>	<b>75</b>
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<p><b>STUDENT PERFORMANCE EVALUATION</b> <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>	<p>Students' performance in the course is evaluated with a written final exam in Greek (or in English for foreign students). The exam consists of multiple choice questions, correct/wrong answer, fill-in-the-gaps, matching questions with answers, and/or problem solving or open questions with short defined answers.</p> <p>Precisely defined evaluation criteria are included in the "Analytical Course Description" that is accessible to students via the Biology Department site.</p>													

#### (5) ATTACHED BIBLIOGRAPHY

<p><i>- Suggested bibliography:</i></p> <p>Carolyn A. Dehlinger. Molecular Biotechnology. Jones &amp; Bartlett Learning, LLC, an Ascend Learning Company, 2016. (Copies are available at the Central Library of the University).</p> <p><i>- Related academic journals:</i></p> <p><i>Nature Biotechnology</i> (Nature Publishing Group)</p> <p><i>Nature Methods</i> (Nature Publishing Group)</p> <p><i>Nano Today</i> (Elsevier)</p> <p><i>PLoS Medicine</i> (Public Library of Science)</p> <p><i>Trends in Biotechnology</i> (Elsevier)</p> <p><i>Molecular Biotechnology</i> (Springer)</p>
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