

Module Outline ETHEBI and BII

1. GENERAL

SCHOOL	OF SCIENCE AND TECHNOLOGY		
PROGRAMME	Studies in Natural Sciences		
LEVEL OF STUDIES	Level 6 of the Hellenic and European Qualifications Framework		
MODULE CODE	ETHEBI and BII	YEAR	3d and 4th
MODULE TITLE	“Biology Laboratory I” and “Biology Laboratory II”		
INDEPENDENT TEACHING ACTIVITIES <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>		HOURS	CREDITS
Weekly workload distance learning: 9-10 hours X 26 weeks Weekly workload in person practice: 40 X 2 weeks		336 (28hours/ECTS)	12 ECTS
MODULE TYPE <i>Compulsory/Elective/ Mandatory Optional</i>	Compulsory		
MODULE DESCRIPTION <i>general background, special background, specialised, general knowledge, skills development</i>	General background, skills development		
PREREQUISITE MODULES	Simultaneous attendance or completion of FYE31 module is required for ETHEBI and simultaneous attendance or completion of FYE43 module is required for ETHEBII		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE MODULE OFFERED TO ERASMUS STUDENTS	No		
MODULE WEBSITE (URL)	ETHEBI: https://www.eap.gr/en/undergraduate/studies-in-natural-sciences/studies-in-physical-sciences-topics/#ethebi and ETHEBII: https://www.eap.gr/en/undergraduate/studies-in-natural-sciences/studies-in-physical-sciences-topics/#ethebii The Module has its own space in the digital learning environment of HOU (https://study.eap.gr/login/index.php) with controlled access (using a code) for students and Teaching Staff.		

2. LEARNING OUTCOMES

Learning outcomes

The learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the Module are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

LEARNING OUTCOMES

Knowledge:

Upon successful completion of the Module, students are expected to:

- Report the application of laboratory biosafety rules and corresponding laboratory equipment
- Describe sterilization rules and their use
- Describe the correct handling of laboratory equipment, such as centrifuges, incubators, photometers, micropipettes, thermal cycler, microscopes, etc.,
- Describe the correct handling of microbial cultures, biological samples, enzymatic reactions, biochemical reactions, etc.
- Browse biological databases and retrieve and process nucleotide and amino acid sequences
- Describe ways of processing and evaluating experimental results

Skills:

Upon successful completion of the Module, students are expected to:

- Prepare laboratory solutions and perform relevant calculations and concentration dilutions
- Sterilize laboratory materials and handle cell/microbial cultures under aseptic conditions
- Analyze quantitatively and qualitatively nucleic acids and proteins, basic components of cells
- Identify bacterial and fungal colonies
- Perform DNA cloning experiments, bacterial transformation, digestion with restriction enzymes
- Detect enzyme activity with biochemical methods and identify inhibitors
- Identify human blood groups
- Analyze mammalian tissues and identify cell organelles with special stains
- Make proper use of photon microscopes and stereoscopes
- Detect mutagenic substances
- Perform polymerase chain reactions (PCR) and analyze results

Competences:

Upon successful completion of the Module, students are expected to:

- Design and implement experimental protocols with appropriate experimental controls
- Combine theory with experimental approach
- Record and organize data in a laboratory notebook
- Perform statistical analysis of experimental data
- Interpret their experimental results and solve problems (troubleshooting)

General Competences

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 Module aim?

<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>Production of new research ideas</i>	

The general skills that the students will acquire are:

- Search for, analysis and synthesis of data and information by the use of appropriate technologies
- Adapting to new situations
- Decision-making
- Individual/Independent work
- Development of free, creative and inductive thinking

3. SYLLABUS

Purpose of Module

The aim of the Laboratory Training biology module is to provide hands-on laboratory training to students in the principles, methods, instrumentation and applications of Cell Biology, Molecular Biology, Genetics, Biochemistry, Bioinformatics and Animal Physiology. It aims to provide students with practical knowledge of laboratory and experimental equipment related to the above disciplines and to ensure their correct and effective use. It also aims to provide students with an understanding of basic principles, concepts and phenomena of Biology through the application of theoretical knowledge acquired in the implementation of specific experimental protocols.

Subjects covered

1. Cell Biology
2. Molecular Biology

3. Genetics
4. Biochemistry
5. Bioinformatics
6. Physiology

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	- Distance teaching and learning. Students participate in five (5) Group Counseling Meetings (GCMs) per laboratory training cycle (I and II) of 4-hour duration during the academic year. - 5-day live wet laboratory training with eight (8) hours of daily laboratory practice per laboratory training cycle (I and II). - Personal communication and feedback (advisory role of Adjunct Faculty).												
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	During GCMs and teaching the following are used: - Remote meetings tools (webex, Teams), - Presentation software (PowerPoint, educational video - animations etc.), - Specialized software/databases for the subjects under study (statistical packages, NCBI PubMed, NCBI Blast, EndNote etc.). In addition, students use office automation tools, web browsers and e-reader for digital books. <u>Communication with the students is supported by:</u> - The digital platform of HOU (https://study.eap.gr/login/index.php) (course information, educational material posts, announcements, messages, examination results, user groups, discussion forums etc.). - e-mail												
TEACHING METHODS <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>	<table border="1"> <thead> <tr> <th>Activity</th><th>Year Workload</th></tr> </thead> <tbody> <tr> <td>10 (5+5) GCMs (x 2 hours)</td><td>20</td></tr> <tr> <td>10 (5+5) quizzes (x 10 hours)</td><td>100</td></tr> <tr> <td>10-day (5+5) live wet laboratory training and examination (x 10 hours)</td><td>80</td></tr> <tr> <td>Individual Study time</td><td>136</td></tr> <tr> <td>Total Workload</td><td>336</td></tr> </tbody> </table>	Activity	Year Workload	10 (5+5) GCMs (x 2 hours)	20	10 (5+5) quizzes (x 10 hours)	100	10-day (5+5) live wet laboratory training and examination (x 10 hours)	80	Individual Study time	136	Total Workload	336
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STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <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>	Students' evaluation – Grade assessment of a Module: a. Five (5) Semester quizzes per laboratory training cycle (I and II) which contribute equally to the final grade with a value of 5% each and 30% of the final grade as a total. <i>The scoring of educational activities and assignments is activated only if the student succeeds in an overall score equal to or above the base (≥ 5) and has completed at least half of the educational activities per laboratory training cycle (I and II).</i> b. Wet laboratory training at the end of the academic year contributing to the final grade of the module by 70%. The Final Grade of the module, within scale 1-10 (10 is the excellent), is calculated as follows: Final Grade= (a x0.3) + (b x0.7) Language of evaluation:												

<i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Greek
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5. ATTACHED BIBLIOGRAPHY

- Campbell Neil and Reece Jane, Biology, volumes I and III, Crete University Press
- Berg Jeremy M., Tymoczko John L., Gregory J. Jr. Gatto, Stryer Lubert, Biochemistry, Crete University Press
- Hartwell Leland, Hood Leroy, Goldberg Michael, Reynolds Ann, Silver Lee, "From genes to Genomes", Utopia publishing

Additional and alternative teaching materials (webcasts) are posted on HOU websites:

<https://apothesis.eap.gr/>

<https://study.eap.gr/>