

COURSE OUTLINE

(1) GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	BIOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BIO_EY01	SEMESTER	5th
COURSE TITLE	GENETICS 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>		WEEKLY TEACHING HOURS	CREDITS
Theory and practicals (laboratory exercises)		6	6
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Scientific		
PREREQUISITE COURSES:	There is no prerequisite course		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek language		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes, in English language		
COURSE WEBSITE (URL)	http://www.biology.upatras.gr/		

(2) LEARNING OUTCOMES

Learning outcomes

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.

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*

Upon course completion, the students should be able to know the following subjects:

1. The genetic material structure,
2. The Central Dogma of Biology,
3. The genetic code,
4. The fine structure and function of the gene,
5. The gene molecular mutations, recombination and DNA repair,
6. The transposable genetic elements,
7. The genetic control of development,
8. The oncogenes and cancer,
9. The behavioral genetics

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 course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

- Autonomous work
- Teamwork
- Search, analyze and synthesize data and information, using the necessary technologies
- Promote free, creative and inductive thinking

(3) SYLLABUS

Theory

1. The genetic material. The molecular nature of the genetic material. 2. Transmission of genetic information The Central Dogma of Biology. 3. Genetic code Genetical and biochemical approach for elucidating the genetic code. 4. Gene fine structure Modern conception of the gene structure and function. Genetical and biochemical approach. 5. Mutations Molecular basis of the mutations. Mutagens mutagenicity and cancer. Repair DNA mechanisms and molecular knowledge of recombination. 6. Transposable genetic elements In pro-and eukaryotic organism. Relative transposition mechanisms and their role in the genome shaping. 7. Developmental genetics The genetical approach of the development in Drosophila. Homeotic genes. Differential gene expression. Tandem gene activity. Sex determination. 8. Oncogenes and cancer. Genetical conception of cancer. Oncogenes and the mechanisms of their activity. Epigenetic mechanisms in cancer. 9. Behavioral genetics An introduction. Genes and behavior – some examples. Intelligent coefficient, personality etc.

Laboratory Exercises

Mutagenesis in *D. melanogaster*.

Isozymes – electrophoresis.

Polytene chromosomes

Lyon's hypothesis-Bar Body

Glutathione Transferase polymorphisms

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face to face	
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Lectures using slides and Power-Point presentations and support of learning through the e-class platform .	
<p style="text-align: center;">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></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>	Activity	Semester workload
	Lectures and seminars	40
	Laboratory exercises	15
	Independent Study	95
Course total	150	
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION <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>1. Theoretical written examinations at the end of the semester (70% of the final grade), which evaluates student's acquired knowledge and critical and creating thinking. Greek grading scale: 1 to 10. Minimum passing grade: 5</p> <p>2. Written examinations on the laboratory exercises at the end of the experimental training (30% of the final grade, taken into account only if the student takes the minimum grade of 5 in the theoretical written examinations).</p> <p>The evaluation is accessible to students through the electronic secretariat and internal announcements from the course professors.</p>	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. P. J. Russell: iGenetics, Μια Μεντελική προσέγγιση
2. W.S. Clug et al.: Βασικές Αρχές Γενετικής
3. L. Hartwel et al. : Γενετική, από τα γονίδια στα γονιδιώματα

- Related academic journals: