

General Biology

1. GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	CHEMISTRY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BI121	SEMESTER	1st
COURSE TITLE	GENERAL BIOLOGY		
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
Lectures		3	5
Seminars		1	
Laboratory work		-	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Field of Science (Biochemistry)		
PREREQUISITE COURSES:	Typically, there are not prerequisite course.		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Teaching may be however performed in English in case foreign students attend the course.		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/CHEM2109/		

2. LEARNING OUTCOMES

Learning outcomes <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> <i>Consult Appendix A</i> • 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											
By the end of this course the student will be able to: 1. Recognize the basic biological functions of the cell and the molecular mechanisms underlie these functions. 2. Recognize the types of animal tissues and their embryonic origin. 3. Recognize the basic principles of the organization and functions of animal organs.											
General Competences <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> <table> <tr> <td>Search for, analysis and synthesis of data and information, with the use of the necessary technology</td><td>Project planning and management</td></tr> <tr> <td>Adapting to new situations</td><td>Respect for difference and multiculturalism</td></tr> <tr> <td>Decision-making</td><td>Respect for the natural environment</td></tr> <tr> <td>Working independently</td><td>Showing social, professional and ethical responsibility and sensitivity to gender issues</td></tr> <tr> <td>Team work</td><td>Criticism and self-criticism</td></tr> </table>		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
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<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>Others</i>
<i>Production of new research ideas</i>	

By the end of this course the student will, furthermore, have developed the following skills (general abilities):

1. Ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories related to cell biology, to the organization and functions of animal tissues and organs.
2. Ability to apply such knowledge and understanding to expand his/her education to more complex issues of general biology as to the solution of biological problems of an unfamiliar nature.
3. Study skills needed for continuing professional development.
4. Ability to interact with others on inter or multidisciplinary problems.

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

Searching, analysis and synthesis of facts and information, as well as using the necessary technologies

Adaptation to new situations

Decision making

Autonomous (Independent) work

Exercise of criticism and self-criticism

Promotion of free, creative and inductive thinking

3. SYLLABUS

1. Principles of cellular organization. Viruses, nucleoprotein complexes, eukaryotic – prokaryotic cell, origin of the cell.
2. Principles of molecular organization Chemical bonds, biomolecules, macromolecules, organization of cellular structures and organelles.
3. Plasma membrane. Functions of membranes, molecular composition and organization, dynamic nature of membranes, transport through membranes.
4. Nucleus – Organization of chromosomes. Structure and organization of nucleus, morphological and functional characteristics of chromosomes.
5. Replication of DNA. Expression and regulation of genetic information. Replication of DNA. Principles of expression and regulation of the gene, transcription, structure and maturation of RNA, genetic code, translation.
6. Cytoplasmic network of membranes. Endoplasmic reticulum, Golgi, synthesis and maturation of proteins, transportation and secretion of proteins, internalization of cells, structures and macromolecules, lysosomes and cellular degradation.
7. Cytoplasmic organelles. Mitochondria and chloroplasts.
8. Cell signalling. Signalling molecules and transduction pathways.
9. Cytoskeleton – cellular motility. Organization of cytoskeleton, microtubules, microfilaments, intermediate filaments, motility of the cells and organelles.
10. Cell growth – cellular division. Mitosis, cellular division, meiosis.
11. Animal tissues. Origin and characteristics of animal cells and tissues.
12. Animal organs. Organization and functions of animal organs.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Lectures, self-tests of students and problem-solving seminars.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <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 lectures content of the course for each chapter are uploaded on the internet, in the form of a series of ppt files, where from the students can freely download them using a

	password which is provided to them at the beginning of the course.	
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>	Activity	Semester workload
	Lectures (3 contact hours per week x 13 weeks)	39
	Seminars (1 contact hour per week x 9 weeks) - solving of representative problems	9
	Mid-term examinations (2 mid-term examinations x 2 contact hours each)	4
	Final examination (3 contact hours)	3
	Hours for private study of the student and preparation for mid-term or/and final examination	70
	Course total	125
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> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	1. Optionally, two mid-term examinations with the final examination grade to be the mean mark. It is mandatory to obtain pass grade (≥ 5) in each examination. 2. Written examination after the end of the semester. Minimum passing grade: 5.	

5. ATTACHED BIBLIOGRAPHY

1. G.M. Cooper and R.E. Hausman. "The cell: a molecular approach" Seventh Edition 2016. 2. V. Marmaras and M. Labropoulou-Marmara, "Cell Biology: a molecular approach", 4th Edition, Typorama Edition, 2000. 3. B. Lewin, "Genes VIII", Volume I and II, (Greek edition), 8th Edition, Translation: G. Stamatiogiannopoulos, Academic Editions I. Basdra, 2004.
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