

Course Title	General Biology				
Course Code	PHA104				
Course Type	Compulsory				
Level	BSc (Level 1)/ MPharm (Level 2)				
Year / Semester	1 st /1 st Semester				
Teacher's Name	Dr Maria Pantelidou				
ECTS	6	Lectures / week	2	Laboratories/week	2
Course Purpose	<p>Since Pharmaceutical Sciences have a substantial component of Biology, the aim of this course is to introduce the students into the essence of Biology, i.e. to familiarize them with the notion of life, its properties and characteristics, such as reproduction, growth, death, the construction of living matter and its basic chemical constituents. Furthermore, the students are introduced to techniques and instrumentation used in biological sciences.</p>				
Learning Outcomes	<p>By the end of this course students should be able to:</p> <p>Introduction to Biology</p> <p>Recognize and explain the importance and contribution of Biology to the progress of medicine, the pharmaceutical and health sector in general.</p> <p>Become familiar with the basic concepts of biochemistry and biology: life, living matter, atoms, molecules, chemical bonds, cells, the biological molecules that make them, organic systems, organisms.</p> <p>Introduction to the cell</p> <p>Identify the cell as a unit of life and understand the basic principles of its biology.</p> <p>Become familiar with different types of cells and identify their similarities and differences.</p> <p>Identify what prokaryotic and eukaryotic cells are, their essential parts and their differences.</p> <p>Familiarize of the main and characteristic differences between organisms (bacteria, plants, fungi and animals).</p> <p>Explain the basic principles of microscopy and become familiar with the use of photon microscopy.</p> <p>Organelles and chemical composition of cells</p>				

	<p>Describe the structure of the biological molecules that make up the cells.</p> <p>Identify and describe the structure, role and function of the organelles of a eukaryotic cell.</p> <p>Describe how energy is produced in animal cells.</p> <p>Explain the process of photosynthesis in plant cells</p> <p>Evolution</p> <p>Explain the evolution of living organisms.</p> <p>Describe Darwinism</p> <p>Genetics and Inheritance</p> <p>Analyse the meaning of genetic material and describe the structure of DNA and RNA.</p> <p>Describe the organization of genetic material in chromosomes.</p> <p>Familiarise with the meaning of genes and the regulation of gene expression.</p> <p>Explain what a genetic mutation is and how it can be associated with a disease.</p> <p>Name various genetic diseases, chromosomal mutations and syndromes.</p> <p>Explain what is genetic diagnosis.</p> <p>Explain genetic material analysis techniques and applications of new technology in medicine.</p> <p>Describe the procedures of cloning and gene therapy and explain the mechanisms involved in these processes.</p> <p>Cell cycle and cell division</p> <p>Analyse the processes of cell division (compare mitosis and meiosis) and cell cycle.</p> <p>Explain the creation of reproductive cells and fertilization</p>		
Prerequisites	None	Corequisites	None
Course Content	<p>Theory:</p> <p>Life, living matter and life features.</p> <p>Organizing live mater.</p> <p>The cell-the organism.</p> <p>Prokaryotic and eukaryotic cells.</p> <p>The key parts of the cell (cell wall, cell membrane, organs and nucleus).</p> <p>Cell function and chemical composition.</p>		

	<p>Viruses, bacteria, plants, fungi, animals - main and characteristic differences.</p> <p>Evolution.</p> <p>Genetic. DNA, genes, chromosomes and inheritance.</p> <p>Food-energy.</p> <p>Cell division, growth and reproduction.</p> <p>Cell cycle and death.</p> <p>Techniques for studying cells and living organisms.</p> <p>Laboratory experiments/exercises:</p> <p>As part of the course, laboratory exercises are carried out on the course material for a better deepening and consolidation of the theoretical part. Indicative exercises are: use of microscope, sample preparation for microscopy, study of cells in the microscope, types of bacteria, genetic material structure, exercises on genetics and heredity, cell Division under microscope-Mitosis-Meiosis.</p>
Teaching Methodology	<p>Teaching methodology includes lectures on the theoretical background and laboratory exercises / experiments to better understand and comprehend concepts of Biology. Detailed lecture notes are presented with image-rich material and short animations to help understand biological processes. During lecture, a discussion is carried out and students are encouraged to answer questions and draw their own conclusions.</p> <p>As part of the development of students' skills, laboratory exercises are carried out by the students themselves in the Laboratory of Biochemistry and Molecular Biology with the proper laboratory equipment and under the supervision of teaching personnel. Appropriate preparation and demonstration by the laboratory personnel precedes each laboratory exercise. Assessment of laboratory exercises is performed by submitting laboratory reports.</p>
Bibliography	<p>(a) <u>Textbooks</u>:</p> <ol style="list-style-type: none"> 1. "Essential Cell Biology" (2019), B. Alberts, D. Bray, K. Hopkin, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter. Publisher: W. W. Norton & Company; Fifth edition 2. "Βασικές Αρχές Κυτταρική Βιολογίας" (2018), B. Alberts, D. Bray, K. Hopkin, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter. Εκδοτικός Οίκος: Ιατρικές Εκδόσεις Πασχαλίδης. <p>(b) <u>References</u>:</p> <ol style="list-style-type: none"> 1. "Biology", 11th Edition, Campbell-Reece et al. Pearson, Benjamin, Cummings, San Francisco, 2017. 2. "Βιολογία" (2013) Συγγραφείς: Jane B. Reece, 1946-2004 Neil A. Campbell. Εκδοτικός Οίκος: Πανεπιστημιακές Εκδόσεις Κρήτης. 3. "Βιολογία-Η Μελέτη της ζωής" (2004) Συγγραφείς: Ε. Αλεξανδρή-Χατζηαντωνίου Εκδόσεις Σταμούλη

Assessment	<p>For student evaluation, the overall grade is determined by a written midterm exam (30%), a laboratory grade (20%) and a written final exam (50%).</p> <p>The mid-term exam is carried out between the 6th and 8th week and it mainly includes short answer questions and problem- solving questions and examines most modules of the course.</p> <p>As far as the laboratory grade is concerned, it comprises of the evaluation of the laboratory reports (60% of the laboratory grade) submitted by the students for each experiment and a final laboratory examination (40% of the laboratory grade) which mainly includes short answer questions and problem-solving questions. In the laboratory reports, students are asked to describe the experiment procedure, to evaluate and analyse their results and to answer specific questions. The following criteria are taken into account when evaluating laboratory reports: (a) experimental data collection (30%), (b) data analysis (40%), and application of theory to draw conclusions (30%).</p> <p>The final exam of the course is carried out during the 14th-16th week of each semester and it includes short answer questions, critical thinking questions, and problem-solving questions regarding all course modules.</p> <p>The final assessment of the students is formative and summative and complies with the subject's expected learning outcomes and the quality of the course.</p>
Language	Greek, English