Course Title	**Biochemistry I**				
Course Code	ABS 103				
Course Type	Compulsory				
Level	BSc (Level 1)				
Year / Semester	1st / 1st Semester				
Teacher's Name	Dr Kyriacos Kyriacou, Dr Vasilia Tamamouna				
ECTS	6	Lectures / week	3	Laboratories/week	2
Course Purpose	Biochemistry is the science that deals with chemical reactions and molecular mechanisms of the organism, thus it is a key subject for students in Applied Biomedical Sciences offering a significant background for their undergraduate studies. The main purpose of this course is to provide students with knowledge about the organism's biomolecules, their properties and functions and an understanding of cell, tissue and organ processes.				
Learning Outcomes	Students are expected to: **Introduction to Biochemistry and basic concepts of the field** Recognize and explain the importance and contribution of Biochemistry to the progress of the medical, pharmaceutical and health sectors in general. Become familiar with the basic concepts of biochemistry: life, living matter, atoms, molecules, chemical bonds, cells, the biological molecules that make them. **Structure and biological role of amino acids** Demonstrate the structure and classification of amino acids. Distinguish the acid-base properties of amino acids. **Structure and function of proteins** Familiarise themselves with the structure of proteins. Understand the general principles of protein structure and folding (primary-secondary-tertiary-quaternary). Illustrate the functions that various proteins have in cells. **Enzymes and enzyme kinetics.** Understand the role of enzymes in cells. Specify coenzymes and their action. Explain and describe the kinetics of enzymatic reactions. Identify the factors that influence an enzymatic reaction.				

	Carbohydrate structure Distinguish between monosaccharides and polysaccharides. Describe the process of glycolysis and gluconeogenesis. Explain the process of photosynthesis in plant cells. **Lipid structure** Understand the structure of fatty acids, phospholipids and triglycerides. Distinguish the structure of biological membranes. **Structure of nucleic acids** Understand the structure of DNA, RNA and their structural components.		
Prerequisites	None	Corequisites	None
Course Content	Theory: Introduction to basic concepts of Biochemistry. Organizing living matter. Water. Chemical bonds and interactions. Amino acids and their properties. Protein structure. Protein function in cells. Enzymes. Coenzymes. Enzyme kinetics. Factors affecting the enzymatic reaction. Carbohydrate structure. Monosaccharides and polysaccharides. Energy and ATP Photosynthesis-Light reactions and Dark Reactions. Lipid structure Structure of cell membranes Structure of nucleic acids **Laboratory experiments/exercises:** 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: spectroscopy, determination of protein concentration by various methods, enzymatic reaction - factors that influence enzymatic activity, protein electrophoresis and detection of aldehyde using Fehling's solution.		
Teaching Methodology	Teaching methodology includes lectures on the theoretical background and laboratory exercises / experiments to better understand concepts of Biochemistry. Detailed lecture notes are presented with image-rich material and short animations are given to help describe/demonstrate several		

	biochemical processes. Students are also introduced to specific databases such as pubmed, Ensembl, etc. During lecture, discussions are carried out and students are encouraged to answer questions and draw their own conclusions. Small exercises are sometimes given, to ticker critical thinking. As part of the developing 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 includes the evaluation of lab reports submitted by each student after each laboratory exercise.
Bibliography	**(a)** Texbooks: • Biochemistry. Berg M.J., Tymoczko L.J., Gato G., Stryer L. 9th ed. Publisher: W. H. Freeman, 2019 • Βιοχημεία. Berg M.J., Tymoczko L.J., Stryer L. (Μετάφραση: Δ. Δραΐνας, Στ. Χατζηλουκάς, Γ.Κ. Παπαδόπουλος, Α. Αλετράς, Α. Κωνσταντίνου, Η. Κούβελας) Εκδόσεις Πανεπιστημίου Κρήτης 2017. **(b)** References: • Βιοχημεία: Lehninger Βασικές αρχές Βιοχημείας: D.L. Nelson, M.M. Cox (Ιατρικές Εκδόσεις Πασχαλίδη, 2η έκδοση) 2018. • Βιοχημεία: Lehninger Βασικές αρχές Βιοχημείας: D.L. Nelson, M.M. Cox (Μετάφραση: Σταματοπουλος Ε. Κωστας, Χατζηδημητριου Ν. Αναστασια) Ιατρικές Εκδόσεις Π.Χ. Πασχαλίδης, Αθήνα 2011.
Assessment	For student evaluation, the overall grade is determined by a written midterm exam (20%), a laboratory grade (20%) and a written final exam (60%). 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 specific modules of the course. As far as the laboratory grade is concerned, it comprises of the evaluation of the laboratory reports (60% of the laboratory grade) provided by the students for every 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%). The final exam of the course is carried out during the 14th-16th week of each semester and includes short answer questions, critical thinking questions, and problem-solving questions regarding all course modules. The final assessment of the students is formative and summative and is

	assured to comply with the subject's expected learning outcomes and the quality of the course.
Language	Greek, English