

Course Title	Biochemistry				
Course Code	NURS105				
Course Type	Compulsory				
Level	BSc (Level 1)				
Year / Semester	1 st / Fall				
Instructor's Name	Dr. Maria Pantelidou				
ECTS	5	Lectures / week	3	Laboratories/week	1
Course Purpose	<p>The aim of this course is to familiarize students with the concepts and principles of Biochemistry. The course focuses on understanding the chemical composition and biological role of the major biomolecules, the basic functions of the human body and the processes of metabolism as well as the biochemical basis of diseases. At the end of the course, students will be able to apply biological science knowledge and to draw conclusions from data/information.</p>				
Learning Outcomes	<p>By the end of this course, the students would be able to:</p> <ul style="list-style-type: none"> - Explain the chemical composition and biological role of the major biomolecules - Describe the basic functions of the human body and the processes of metabolism - Comprehend the biochemical basis of various diseases - Identify and apply knowledge based on biological sciences - Draw conclusions from biologic data and conclusions 				
Prerequisites	None		Corequisites	None	
Course Content	<p>Theory:</p> <ul style="list-style-type: none"> - Introduction to Biochemistry. Cells, biological molecules (biomolecules), atom bonds and water. - Acids, bases, solutions, pH. Thermodynamics of biochemistry. - Protein structure and function. The protein building blocks: amino acids, peptides and polypeptides. Peptide bond. The three-dimensional structure of proteins. Functional diversity of proteins. - Enzymes. Enzymatic reaction. Active enzyme centers. Enzymes and diagnosis: clinical importance of measuring enzyme activity - Vitamins and coenzymes. - Carbohydrates - Lipids and Cell Membranes - Metabolism-Energy - Glycolysis and gluconeogenesis 				

	<ul style="list-style-type: none"> - The Citric Acid Cycle (Krebs Cycle) - Electron transport and oxidative phosphorylation - Glycogen metabolism. Adjusting blood glucose levels. - Metabolism of fatty acids, cholesterol, amino acids, nucleotides - A combination of metabolism and hormonal action. <p>Laboratory:</p> <p>The laboratory part of the course involves exercises such as: Calculating the concentration/molarity of a solution. Understanding the composition of IV fluid, Drug concentrations, Acid-Base-pH, Enzymatic reaction-example, Enzymes used in disease diagnosis, Biochemical/Blood Tests results.</p>
<p>Teaching Methodology</p>	<p>Theory</p> <p>The teaching of the course includes lectures on the theoretical background and laboratory exercises / experiments to better understand and embed the major concepts of Biochemistry. Detailed notes with PowerPoint are used in the lesson. Image-rich material and short animations are used to gain a better understanding of some molecular biology reactions. Case Studies, Discussion, Questions / Answers are also used depending on the content of the lecture. Lecture notes and presentations are available online for use by students in combination with textbooks. Relevant material published in international scientific journals are also used to follow the latest developments related to the subject of the course.</p> <p>Laboratory</p> <p>Before each laboratory experiment/exercise the lab assistant demonstrates procedures and provides students with all relevant information. The evaluation of the laboratory experiments is performed by submitting lab reports, handouts, solving exercises, answering questions related to the material taught.</p>
<p>Bibliography</p>	<p>(a) <u>Textbooks:</u></p> <p>Berg M.J., Tymoczko L.J., Gato G., Stryer L. (2019). <i>Biochemistry</i>. 9th ed. Publisher: W. H. Freeman</p> <p>Berg M.J., Tymoczko L.J., Stryer L. (2017). <i>Βιοχημεία</i> (Μετάφραση: Δ. Δραΐνας, Στ. Χατζηλουκάς, Γ.Κ. Παπαδόπουλος, Α. Αλετράς, Α. Κωνσταντίνου, Η. Κούβελας) Εκδόσεις Πανεπιστημίου Κρήτης (In Greek)</p> <p>(b) <u>References:</u></p> <p>Nelson, D.L. & Cox, M.M. (2021). <i>Lehninger Principles of Biochemistry</i>. 8th Edition</p> <p>Nelson, D.L. & Cox, M.M. (2018). <i>Lehninger Βασικές αρχές Βιοχημείας</i></p>

	<p>(Μετάφραση: Σταματοπουλος Ε. Κωστας, Χατζηδημητριου Ν. Αναστασια) Ιατρικές Εκδόσεις Π.Χ. Πασχαλίδης. (In Greek)</p> <p><i>Through the services of the university library, access is provided to electronic repositories of scientific journals and articles, indicatively ProQuest, Cambridge University Press and Science Direct with thousands of scientific journals in the fields of health sciences.</i></p>
Assessment	<p>The assessment of this course consists of the coursework (midterm exam, laboratory assessment, class participation) and final exam.</p> <p>Mid-Term Exam: 30%. A written midterm exam will be comprised by multiple choice questions and written response questions.</p> <p>Laboratory evaluation: 10%. The laboratory assessment includes laboratory exercises and problem-solving exercises on various subjects in biochemistry.</p> <p>Student Participation: 10%. The class participation includes formative assessments with interactive problem-solving questions/exercises and discussion.</p> <p>Written Final Exam: 50%. A written final exam will be comprised by multiple choice questions, written response questions.</p>
Language	Greek / English