

Course Title	Biochemistry I				
Course Code	BMS214				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2 <sup>nd</sup> Year / 3 <sup>rd</sup> Semester				
Teacher's Name	TBA				
ECTS	7	Lectures / week	3 Hours	Laboratories / week	3 Hours
Course Purpose and Objectives	<p>The objective of the course is to familiarize students with</p> <ul style="list-style-type: none"> <li>• The principal biochemical and metabolic processes in the body, their pathways and the role of the cell membrane and the different enzymes</li> <li>• The process of intra- and inter- cellular communication</li> </ul>				
Learning Outcomes	<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> <li>• Identify the principal classes of biomolecules and explain their function or activity with regard to their chemical structure.</li> <li>• Explain the interactions of simple biomolecules giving rise to complex supramacromolecular structures.</li> <li>• Describe the structure and properties of water and understand its macromolecular structure, its properties and biological functions.</li> <li>• Discuss the general principles of enzymology and the importance of enzymes as essential molecules in cellular metabolism.</li> <li>• Analyze the principal metabolic strategies that are used by the human body to obtain and use energy.</li> <li>• Describe the principal biochemical metabolic processes, their interrelationships and their role in maintaining bioenergetic balances in the body.</li> <li>• Describe the role of biological membranes in the processes which generate and use biological energy and also maintain the compartmentalization of the vital processes.</li> <li>• Explain the molecular basis of signal transduction pathways.</li> <li>• Relate the metabolic changes in pathophysiological processes to the most common biochemical analyses, analyse and evaluate the origin of changes and their physiological consequences.</li> </ul>				
Prerequisites	None		Co-requisites	None	

Course Content	<p><b>Course description</b></p> <p><b>Theory</b></p> <ul style="list-style-type: none"> <li>• Biomolecules and the interactions of simple biomolecules giving rise to complex supramacromolecular structures</li> <li>• Carbohydrate metabolism: glycolysis and gluconeogenesis</li> <li>• Citric acid cycle</li> <li>• Phosphoglyconic acid pathway and pentose phosphate</li> <li>• Structure and properties of water, its macromolecular structure, its properties and biological functions.</li> <li>• Enzymology and the roles of enzymes as essential instruments <ul style="list-style-type: none"> <li>○ in cellular metabolism,</li> <li>○ in the principal metabolic strategies to obtain and use energy</li> </ul> </li> <li>• Metabolic processes of the principal types of biomolecules; their interrelations and bioenergetic balances.</li> <li>• Biological membranes and the processes which generate and use biological energy</li> <li>• Molecular basis of the signal transduction pathways.</li> <li>• Mitochondrial diseases.</li> </ul> <p><b>Laboratory exercises</b></p> <ul style="list-style-type: none"> <li>• Safety regulations and good laboratory practice</li> <li>• Buffer preparation, calculations and pipette use</li> <li>• Introduction to basic techniques (measurements, dilutions, UV spectroscopy)</li> <li>• Lipid effusion techniques</li> <li>• Carbohydrate assessment using paper chromatography</li> <li>• Protein isolation from cell cultures</li> <li>• Spectrophotometric measurement of protein concentration</li> <li>• Protein separation by SDS-PAGE electrophoresis</li> <li>• Analysis of alkaline phosphatase enzyme</li> </ul>
Teaching Methodology	Face- to- face
Bibliography	<p>Textbook of Biochemistry with Clinical Correlations; Devlin, Thomas M.; 7th; 978-0470281734; John Wiley; 2010</p> <p><a href="#">Biochemistry: International Edition</a>; Berg, J.M., Tymoczko, J.L.and Stryer;</p> <p><b>ADDITIONAL RECOMMENDED TEXTBOOKS:</b></p> <p>Introduction to Modern Biochemistry, by P. Karlson</p>

Assessment	<table border="1"><tr><td>Mid – Term Examination</td><td>30%</td></tr><tr><td>Final Examination</td><td>40%</td></tr><tr><td>Assignments/Lab</td><td>20%</td></tr><tr><td>Class Participation</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table>	Mid – Term Examination	30%	Final Examination	40%	Assignments/Lab	20%	Class Participation	10%		100%
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Language	English										