

## Subject Description Form

<b>Subject Code</b>	ABCT2312
<b>Subject Title</b>	Introductory Cell Biology and Biochemistry
<b>Credit Value</b>	3
<b>Level</b>	2
<b>Pre-requisite / Co-requisite/ Exclusion</b>	
<b>Objectives</b>	To introduce the fundamental concepts of cell biology and biochemistry
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Identify the structures and function of cell organelles and the cell as an entity, and of the techniques used in cell biology</li> <li>b. Explain the basis of functional systems within an organism, where cells function as the basic building blocks</li> <li>c. Explain the concepts of genetic information coding and expression of the genetic information</li> <li>d. Explain fundamental concepts in biochemistry</li> <li>e. Appreciate the important roles of biological molecules in living systems</li> <li>f. Explain the important interactions between biochemical pathways in an organism</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p>Cell structure and functions: prokaryotic and eukaryotic cells, the architecture of plasma membrane, transport across membrane, internal membranes and cell energetic, chemical signaling between cells, cytoskeleton and cell movement, cilia and flagella, endoplasmic reticulum, ribosome, Golgi apparatus, lysosome and peroxisomes, the nucleus, chromosomes and DNA replication (8 hours)</p> <p>Cell cycles and development of cell specificity in eukaryotes, cell cycle and cells in early stage of development, determination and differentiation of cells in higher eukaryotes, and important roles of stem cells (4 hours)</p> <p>Introduction to important methods in cell biology: cell fractionation, light microscopy, electron microscopy, cell and tissue culture (4 hours)</p> <p>Structure, properties and functions of molecules of life: water, carbohydrates, lipids, proteins and vitamins. Vision biochemistry and its relation to Vitamin A. (7 hours)</p> <p>Gene expression: The genetic code; transcription; translation (4 hours)</p> <p>Enzymes: nature and mode of action of enzymes, regulation and importance in biological systems, isoenzymes and coenzymes, enzyme kinetics (2 hours)</p> <p>Catabolism and generation of energy: bioenergetic principles, glycolysis, citric acid cycle, hexose monophosphate shunt, electronic transport, oxidation of fat, proteolysis, deaminations, fate of carbon skeleton, urea cycle (7 hours)</p> <p>Biosynthesis and utilization of energy: gluconeogenesis, glycogenesis, biosynthesis of lipids, amino acids and proteins (3 hours)</p>

<b>Teaching/Learning Methodology</b>	<p><b>Lecture:</b> Mass lecture.</p> <p><b>Tutorial:</b> Tutorials are aimed at clarifying material related to lectures and background reading. They will be organized as group discussion on (a) assigned structured problems and (b) areas of weakness identified through continuous assessment or structure self-learning processes.</p>																																																							
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" data-bbox="520 465 1458 837"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>f</th> </tr> </thead> <tbody> <tr> <td>1. Coursework</td> <td>50%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>2. Examination</td> <td>50%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Total</td> <td>100%</td> <td colspan="6"></td> </tr> </tbody> </table> <p><u>Course work</u></p> <p>Course work will include tests, tutorial questions/presentations and homework. They will assess the students' ability to understand the lecture materials, be able to synthesize new knowledge based on the lecture materials (tested by the tutorial questions and presentations which are not directly derived from lecture materials) and to appreciate the structures in different biochemical pathways (tested by matching the structures to their associated functions).</p> <p><u>Examination</u></p> <p>Conventional examination-type of questions like MCQ and short questions which are used to test the students' ability to understand the basic concepts and to derive new knowledge based on the former. Pure memorization of the detailed process, biochemical structure and names are not encouraged. Rather, the basic concepts about different processes and pathways are emphasized, together with the test for their understanding of the techniques used in studying cell biology.</p>								Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d	e	f	1. Coursework	50%	√	√	√	√	√	√	2. Examination	50%	√	√	√	√	√	√	Total	100%																
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<b>Reading List and References</b>	<p><u>Prescribed Reading</u></p> <p>Becker WM, Kleinsmith LJ, Hardin J, and Bertoni GP. "The world of the cell" Pearson seventh edition. 2009</p> <p>Nelson DL. "Lehninger principles of biochemistry". New York Worth Publishers c 2008</p>																																																							