

## Subject Description Form

<b>Subject Code</b>	ABCT4105
<b>Subject Title</b>	Metabolism and Diseases
<b>Credit Value</b>	3
<b>Level</b>	4
<b>Pre-requisite</b>	Biochemistry
<b>Objectives</b>	The aim of this subject is for students to acquire a deeper understanding of metabolism through the study of breakdown and biosynthesis of important biomolecules, in particular with reference to some examples of common metabolic diseases.
<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) gain in-depth understanding of carbohydrates, amino acids, lipids and nucleotides metabolism and the roles of vitamins and minerals in metabolism.</li> <li>b) appreciate the inter-relationship of intermediate metabolites and the importance of metabolic regulation.</li> <li>c) develop higher level skills in biochemical assays and interpretation and analysis of biochemical data in some common metabolic disease states.</li> <li>d) practice analytical and critical thinking, oral and written communication skills.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p>Pentose phosphate pathway and reducing equivalents; anaplerotic reactions and carbohydrate metabolism; glycogen synthesis and breakdown; common diseases of carbohydrate metabolism. (8 hours)</p> <p>Amino acid metabolism: synthesis of amino acids from intermediates of the citric acid cycle; synthesis of glutamine, proline and arginine from glutamate; synthesis of serine, cysteine, histidine and aromatic amino acids; regulation of amino acid biosynthesis; urea cycle; common diseases of amino acid metabolism. (8 hours)</p> <p>Lipid metabolism: synthesis of triacylglycerol and membrane lipids; metabolism of cholesterol and steroid hormones; turnover of fats and lipoproteins; common diseases of lipid metabolism. (14 hours)</p> <p>Nucleotide metabolism: biosynthesis and catabolism of nucleotides. Cancer drugs targeting nucleotide metabolism pathways. (6 hours)</p> <p>Vitamins and coenzymes, essential and trace minerals: their role in metabolism and common diseases. (4 hours)</p> <p>Xenobiotics metabolism: Cytochrome P450; drug and toxin metabolism. (3 hours)</p>

<b>Teaching/Learning Methodology</b>	Lectures are designed to provide students with the essential concepts of intermediate metabolism, metabolic regulations and diseases. To enhance their learning and knowledge, problem-based and student-centered learning approach will be employed. Students will be given assignments for discussions and presentations. Tutorial classes and Blackboard platform will be used to gauge their learning and performance. Laboratory classes will require students to design experiments and skills in data interpretation and report writing. A variety of assessment tools will be used, including quizzes, pre- and post-lab tests, assignments, presentations and reports to develop students' critical mind, analytical skills, critical thinking and communication skills.																																													
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">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> </tr> </thead> <tbody> <tr> <td>1. Lab reports</td> <td>25%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>2. Quizzes</td> <td>30%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>3. Examination</td> <td>40%</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>4. Attendance</td> <td>5%</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>100%</td> <td colspan="4"></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Assignments, presentation, quizzes and examination are used to gauge how much students have learned in the metabolism, inter-relationships and the regulation of metabolism of the different common biomolecules. Oral presentation skills will be in particular assessed in the presentation while writing skills will be assessed in all the other assessment tasks and methods. The laboratories and laboratory reports in particular demand students to demonstrate their competence in executing biochemical assays and in the interpretation and analysis of experimental data.</p> <p>Students are required to attend at least 75% of scheduled sessions for the subject. Students fail to fulfill the attendance requirement will lose the 5% attendance score.</p>						Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	1. Lab reports	25%	√	√	√	√	2. Quizzes	30%	√	√	√	√	3. Examination	40%	√	√	√	√	4. Attendance	5%					Total	100%				
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	Total student study effort	130 Hrs.
<b>Reading List and References</b>	<p><b><u>Essential</u></b>  Nelson, D. L. and Cox, M.M.      Lehninger Principles of Biochemistry, 6<sup>th</sup> Ed.      Worth 2013</p> <p><b><u>Supplementary</u></b>  Berg, J.M., Tymoczko, J.L., and Stryer, L.      Biochemistry, 7<sup>th</sup> Ed.      Freeman 2012</p>	