Subject Description Form

Subject Code	FSN2002
Subject Title	Biochemistry and Cell Biology for Food and Nutrition
Credit Value	3
Level	2
Pre-requisite	FSN1004 Fundamentals of Modern Science in Food and Nutrition
Objectives	The aims of this subject are to introduce the foundation concepts of cell biology in relation to nutrition and provide students basic understanding of structure, function, and metabolism of macronutrients
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Show an understanding of the basic concepts in cell and molecular biology b. Recognize the structure, properties and functions of simple carbohydrates, lipids, and amino acids. c. Describe the basic principles of macronutrients metabolism in human body. d. Appreciate the role and function of DNA and genetics in food and nutrition. e. Develop analytical, critical thinking, and written communication skills.
Subject Synopsis/ Indicative Syllabus	- **Cell structure and functions**: overview of human cells; structure and function of plasma membrane, internal membranes, endoplasmic reticulum, ribosome, Golgi apparatus, the nucleus; production of cell energy. - **Basic Genetics** Codon, Transcription and Translation - **Structure and functions of food biomolecules**: carbohydrates, lipids, proteins - **Catabolism of macronutrients**: bioenergetic principles, glycolysis, citric acid cycle, hexose monophosphate shunt, electronic transport, oxidation of fat, proteolysis, deaminations, fate of carbon skeleton, urea cycle - **Biosynthesis and utilization of energy**: gluconeogenesis, glycogenesis, biosynthesis of lipids, amino acids and proteins - **Enzymes**: nature and mode of action of enzymes; importance and regulation of enzymatic reactions in biological systems; enzyme kinetics

<table>
<tr><td>Teaching/Learning Methodology</td><td>Lectures are designed to provide students with the basic concepts on the subject content thru a problem-based approach. Tutorials are aimed at clarifying material related to lectures and background reading. Laboratory classes are used to introduce to students some basic techniques in biochemistry and to develop their skills in data interpretation and report writing.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>1. Assignment</td><td>10%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Quizzes</td><td>25%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>3. Lab Reports</td><td>15%</td><td></td><td>√</td><td></td><td>√</td><td>√</td></tr>
<tr><td>4. Examination</td><td>50%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Quizzes and assignment will be used to assess the students' ability to understand the lecture materials, be able to synthesize new knowledge based on the lecture materials.

The laboratories and laboratory reports emphasise the demonstration from students on their competence and familiarity in executing biochemical assays along the subsequent interpretation and analysis of experimental data.

Examination will include MCQ and written questions which are set to evaluate students' ability to understand the basic concepts.
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<tr><td>Student Study Effort Required</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>Lecture</td><td>26 Hrs.</td></tr>
<tr><td>Tutorial</td><td>11 Hrs</td></tr>
<tr><td>Laboratory Sessions</td><td>6 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>Self study</td><td>76 Hrs.</td></tr>
<tr><td>Report Writing</td><td>6 hrs</td></tr>
<tr><td>Total Study Effort:</td><td>125 Hrs</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Becker, W. M.(2009). The world of the cell. 7th ed. Pearson.
Alberts, Bruce (2010). Essential cell biology 3rd ed. Garland Science.
Lehninger, A. L. (2021). Lehninger principles of biochemistry. 8th edition / Macmillan Learning.</td></tr>
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