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| <b>Module Title:</b>   | Biochemistry 2  |
| <b>Language of Instruction:</b>  | English   |
| <b>Credits:</b>  | 5   |
| <b>NFQ Level:</b>  | 7   |
| <b>Module Delivered In</b>   | <a href="#">2 programme(s)</a>  |
| <b>Teaching &amp; Learning Strategies:</b>   | <p>This module will be delivered via a two theory classes of one hour duration for 12 weeks and one two-hour practical every week for 12 weeks. Students may be required to access the material via the VLE Blackboard in advance of the class and practicals to encourage active learning. To consolidate lectures and practicals, students will be required to carry out assignments, take formative quizzes and multiple choice questions. Group and peer learning will be facilitated during the preparation of assignments and practicals. Any course-related issue or questions that may arise will be discussed at lectures. Students can contact lecturer outside of class hours to discuss formative feedback given on written reports and group project work. The practical component will:</p> <ul style="list-style-type: none"> <li>• Allow students to develop the required technical competencies, attitudes and behaviours.</li> <li>• Develop problem solving abilities and group skills.</li> <li>• Promote deep learning via investigation of a problem, application of prior knowledge and analysis of results thus generating new knowledge.</li> <li>• Promote timely submission of reports written in the standard format.</li> <li>• Allow individual interaction with the lecturer.</li> </ul> |
| <b>Module Aim:</b>   | The aim of this module is to expand the students knowledge of biochemical processes, systems and structures.  |
| <b>Learning Outcomes</b>   |   |
| <i>On successful completion of this module the learner should be able to:</i>  |   |
| LO1  | Describe the biologically important interactions with light; Photosynthesis; Biochemistry of the visual process. Signal Transduction: G-proteins, Adenylyl cyclase signalling pathway, Inositol-phospholipid signalling pathway; receptor tyrosine kinases.   |
| LO2  | Describe and elucidate the pathway involved in cholesterol biosynthesis; Lipid metabolism and regulation, Ketone bodies as fuel molecules.  |
| LO3  | Carry out a range of biochemical analysis in the laboratory with due regard to health and safety. Develop individual and team based biochemical analysis skills.  |
| <b>Pre-requisite learning</b>  |   |
| <b>Module Recommendations</b><br><i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>         |   |
| No recommendations listed  |   |
| <b>Incompatible Modules</b><br><i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i> |   |
| No incompatible modules listed   |   |
| <b>Co-requisite Modules</b>  |   |
| No Co-requisite modules listed   |   |
| <b>Requirements</b><br><i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>          |   |
| Successful completion of year 2 or equivalent.   |   |

**Module Content & Assessment**
**Indicative Content**
**Photobiology; Hormones and Signalling.**

Describe the biologically important interactions with light; Photosynthesis; Biochemistry of the visual process. Signal Transduction: G-proteins, Adenylyl cyclase signalling pathway, Inositol-phospholipid signalling pathway; receptor tyrosine kinases.

**Cholesterol biosynthesis.**

Describe and elucidate the pathway involved in cholesterol biosynthesis; Lipid metabolism and regulation, Ketone bodies as fuel molecules.

**Practical**

Students will build on biochemical skills developed to date and apply these in areas such as adsorption, thin-layer chromatography of lipids, enzyme analysis, enzyme assays, protein analysis and identification. Electrophoresis, crude protein extraction and chromatography.

| Assessment Breakdown             | %      |
|----------------------------------|--------|
| Continuous Assessment            | 20.00% |
| Practical                        | 30.00% |
| End of Module Formal Examination | 50.00% |

**Special Regulation**

Students must achieve a minimum grade (35%) in both the practical/CA and final examination.

**Continuous Assessment**

| Assessment Type | Assessment Description  | Outcome addressed | % of total | Assessment Date |
|-----------------|---|-------------------|------------|-----------------|
| Other           | Multiple choice questions and short answer questions will be used to assess student progress in Semester 1. | 1,2               | 20.00      | n/a             |

No Project

**Practical**

| Assessment Type             | Assessment Description  | Outcome addressed | % of total | Assessment Date |
|-----------------------------|---|-------------------|------------|-----------------|
| Practical/Skills Evaluation | Students will submit their Practical laboratory books after each laboratory practical for feedback. | 3                 | 30.00      | Every Week      |

**End of Module Formal Examination**

| Assessment Type | Assessment Description                       | Outcome addressed | % of total | Assessment Date |
|-----------------|--|-------------------|------------|-----------------|
| Formal Exam     | Formal examination at the end of Semester 2. | 1,2               | 50.00      | End-of-Semester |

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

**Module Workload**

| <b>Workload: Full Time</b> |                    |  |
|----------------------------|--------------------|--|
| <i>Workload Type</i>       | <i>Frequency</i>   | <i>Average Weekly Learner Workload</i> |
| Lecture                    | 12 Weeks per Stage | 2.00                                   |
| Laboratory                 | 12 Weeks per Stage | 2.00                                   |
| Estimated Learner Hours    | 15 Weeks per Stage | 5.13                                   |
|                            | Total Hours        | 125.00                                 |

**Module Delivered In**

| Programme Code | Programme  | Semester | Delivery  |
|----------------|--|----------|-----------|
| CW_SABTP_B     | <a href="#">Bachelor of Science (Honours) in Biosciences with Biopharmaceuticals</a> | 6        | Mandatory |
| CW_SABFQ_D     | <a href="#">Bachelor of Science in Biosciences</a>                                   | 6        | Mandatory |