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| <b>Module Title:</b>  | Current Concepts in Science  |
| <b>Language of Instruction:</b>   | English  |
| <b>Credits:</b>   | 5  |
| <b>NFQ Level:</b>   | 6  |
| <b>Module Delivered In</b>  | <a href="#">5 programme(s)</a>   |
| <b>Teaching &amp; Learning Strategies:</b>  | This module will be taught in two theory classes of one hour duration. Course lecture summaries, course calendar, announcements and other course-related material will be available on Blackboard, a virtual learning environment. Students can contact lecturer outside of class hours to discuss formative feedback. |
| <b>Module Aim:</b>  | The aim of this module is to introduce students to forensic, pharmaceutical and environmental science issues, ethics and philosophy of science as well as practical applications which form a basis for other modules.   |
| <b>Learning Outcomes</b>  |  |
| <i>On successful completion of this module the learner should be able to:</i>                                       |  |
| LO1   | Describe key concepts in Pharmaceutical science, forensic science, environmental science issues and ethics and philosophy of science.  |
| LO2   | Expand on the key concepts of Pharmaceutical concepts, forensic science, environmental science issues as well as ethics and philosophy of science.   |
| LO3   | Communicate with peers and academic staff effectively through written projects, oral presentations and powerpoint presentations.   |
| <b>Pre-requisite learning</b>   |  |
| <b>Module Recommendations</b>   |  |
| <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>   |  |
| <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>   |  |
| <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>  |  |
| No requirements listed  |  |

**Module Content & Assessment**

**Indicative Content**

**Pharmaceutical Science: Measurement Units, Calculations, Concentrations**

Introduction to the Pharmaceutical Industry. Measurements and weights. Density. Dosage & Percentage calculations. Ratio strength (parts). Proof strength. Dilutions. Solubility. Chemical calculations. Molarity, %w/v, %v/v, %w/w, Osmolarity. Isotonicity. Accuracy and precision of results.

**Pharmaceutical Science: Topical, oral, liquid & transdermal preparations**

The structure and function of the skin. Preparation of creams, emulsions and lotions etc. Gels and Shampoos. Oral Syrups, elixirs and linctuses. Advantages of Delivery, Stability and Shelf-life. Transdermal drug absorption and delivery. Types of patches available.

**Analysis a crime scene: Methods and techniques.**

Introduction to the techniques and practice of evidence collection, criminal evidence and the crime scene preservation.

**Forensic Analysis**

Fingerprint, ballistics and tool mark analysis. Glass, paint, blood and blood spatter analysis. Toxicology analysis. Techniques used in the analysis of the above samples. An introduction to DNA fingerprinting and the techniques involved.

**Environmental Science: Water.**

The role of water in the environment. Techniques involved in the measurement and monitoring of water quality. Water pollutants and their effects on ecosystems. Basic EU and National legislation relating to water quality.

**Environmental Science: Soil and waste.**

Polluted soil remediation technologies including traditional technologies and more recent sustainable/ green bioremediation technologies. Techniques of waste removal from soil, water and other environmental issues. Basic EU and National legislation relating to soil quality.

**Philosophy of Science and Ethics.**

Introduction to foundations, methods and implications of science; defining science, scientific explanation, justifying science, scientific observation and theory, the purpose of science, values and science. The place of ethics and bioethics in Science. Fundamental issues of ethics - genetic engineering, GMOs to name a few.

**Case studies.**

Case study examples will include: Caenorhabditis elegans and its three Nobel prizes; nanotechnology in life sciences and the environment; science and wildlife conservation. Case studies may be substituted as appropriate.

| Assessment Breakdown  | %      |
|-----------------------|--------|
| Continuous Assessment | 50.00% |
| Project               | 50.00% |

**Continuous Assessment**

| Assessment Type        | Assessment Description   | Outcome addressed | % of total | Assessment Date |
|------------------------|--|-------------------|------------|-----------------|
| Short Answer Questions | The CA will be a combination of short answer questions, and/or Multiple choice questions and/or presentation (where applicable). | 1,2,3             | 50.00      | n/a             |

**Project**

| Assessment Type | Assessment Description                                 | Outcome addressed | % of total | Assessment Date |
|-----------------|--|-------------------|------------|-----------------|
| Project         | Student will do a project on any aspect of the course. | 1,3               | 50.00      | n/a             |

No Practical

No End of Module Formal Examination

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 | 4.00                                   |
| 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>  | 2        | Mandatory |
| CW_SAPHA_B     | <a href="#">Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation</a>   | 2        | Mandatory |
| CW_SAASC_D     | <a href="#">Bachelor of Science in Analytical Science</a>                             | 2        | Mandatory |
| CW_SABFQ_D     | <a href="#">Bachelor of Science in Biosciences</a>                                    | 2        | Mandatory |
| CW_SASCI_C     | <a href="#">Higher Certificate in Science in Applied Biology or Applied Chemistry</a> | 2        | Mandatory |