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|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Module Title:                                                                                                                        | Organic and Physical Chemistry 1                                                                                                                                                                                                                                                                                                                                                   |           |
| Language of Instruction:                                                                                                             | English                                                                                                                                                                                                                                                                                                                                                                            |           |
| Credits:                                                                                                                             | 5                                                                                                                                                                                                                                                                                                                                                                                  |           |
| NFQ Level:                                                                                                                           | 6                                                                                                                                                                                                                                                                                                                                                                                  |           |
| Module Delivered In                                                                                                                  | <a href="#">3 programme(s)</a>                                                                                                                                                                                                                                                                                                                                                     |           |
| Teaching & Learning Strategies:                                                                                                      | This module will be taught in three one hour theory classes and one three hour practical session per week. To consolidate lectures and practicals, students will normally be required to carry out assignments and prepare a weekly practical report analyzing their own research and results. Any course-related issue or questions that may arise will be discussed at lectures. |           |
| Module Aim:                                                                                                                          | The aim of this module is to impart knowledge of fundamental organic and physical chemistry and to provide practical training in this subject area with due regard to best practice and safety.                                                                                                                                                                                    |           |
| Learning Outcomes                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| On successful completion of this module the learner should be able to:                                                               |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| LO1                                                                                                                                  | Draw the structures and shapes of the main types of organic chemicals                                                                                                                                                                                                                                                                                                              |           |
| LO2                                                                                                                                  | Draw the reaction mechanisms of some of the main reactions in organic and synthetic organic chemistry.                                                                                                                                                                                                                                                                             |           |
| LO3                                                                                                                                  | List, describe and explain the tests used to identify unknown organic chemicals.                                                                                                                                                                                                                                                                                                   |           |
| LO4                                                                                                                                  | Discuss and explain kinetic theory (the order and rate of reaction, the activation energy of reaction and the half -life of a reaction) and carry out relevant mathematical calculations based on reaction rate data.                                                                                                                                                              |           |
| LO5                                                                                                                                  | Perform and interpret designated laboratory exercises with due regard to safety and best practice.                                                                                                                                                                                                                                                                                 |           |
| Pre-requisite learning                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| Module Recommendations<br>This is prior learning (or a practical skill) that is recommended before enrolment in this module.         |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| 4504                                                                                                                                 | SCIE H1111                                                                                                                                                                                                                                                                                                                                                                         | Chemistry |
| Incompatible Modules<br>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| No incompatible modules listed                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| Co-requisite Modules                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| No Co-requisite modules listed                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| Requirements<br>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.          |                                                                                                                                                                                                                                                                                                                                                                                    |           |
| No requirements listed                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                    |           |

## Module Content & Assessment

### Indicative Content

#### Aliphatic Hydrocarbons

Aliphatic Hydrocarbons. Hybridisation. Physical properties, shapes and reactions of alkanes, alkenes, alkynes and cyclic aliphatic compounds. Conjugated systems

#### Stereochemistry

Stereochemistry, optical activity, optical purity, polarimetry, geometric isomers

#### Kinetics

Rate equations, collision theory, Arrhenius equation, activation energy, catalysis.

#### Practicals

One "dry" practical covering relevant calculation. Subsequent practicals will develop the following synthetic skills - distillation, reflux, recrystallisation, soxhlet extraction, multi-step product synthesis, yield calculation, product purity determination, reaction rate studies, solvent extraction and other specialised reactions.

| Assessment Breakdown  | %      |
|-----------------------|--------|
| Continuous Assessment | 60.00% |
| Practical             | 40.00% |

### Special Regulation

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

### Continuous Assessment

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|------------------------|-------------------|------------|-----------------|
| Examination     | 3 x 1 hour CA exams    | 1,2,3,4           | 60.00      | n/a             |

No Project

### Practical

| Assessment Type             | Assessment Description           | Outcome addressed | % of total | Assessment Date |
|-----------------------------|----------------------------------|-------------------|------------|-----------------|
| Practical/Skills Evaluation | Practical Laboratory report book | 5                 | 40.00      | End-of-Semester |

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 | 3.00                                   |
| Laboratory                 | 12 Weeks per Stage | 3.00                                   |
| Estimated Learner Hours    | 15 Weeks per Stage | 3.53                                   |
| Total Hours                |                    | 125.00                                 |

**Module Delivered In**

| Programme Code | Programme                                                                             | Semester | Delivery         |
|----------------|---------------------------------------------------------------------------------------|----------|------------------|
| CW_SAPHA_B     | <a href="#">Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation</a>   | 3        | Mandatory        |
| CW_SAASC_D     | <a href="#">Bachelor of Science in Analytical Science</a>                             | 3        | Mandatory        |
| CW_SASCI_C     | <a href="#">Higher Certificate in Science in Applied Biology or Applied Chemistry</a> | 3        | Group Elective 2 |