1. **Title of the module**

CHEM5040 (CH504) - Organic Reaction Mechanisms

1. **School or partner institution which will be responsible for management of the module**

Physical Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 5

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn and Spring

1. **Prerequisite and co-requisite modules**

**Prerequisites:**

CHEM3080 Molecules, Matter and Energy

CHEM3090 Fundamental Organic Chemistry for Physical Scientists

CHEM3140 Introduction to Biochemistry and Drug Chemistry

CHEM3820 Chemical Skills

1. **The programmes of study to which the module contributes**

BSc/BSc with Foundation Year/BSc with Year in Industry/MChem in Chemistry

This is not available as a wild module.

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**

Have a knowledge and understanding of:

1. Knowledge and understanding of core and foundation scientific physical and chemical concepts, terminology, theory, units and conventions to chemistry and forensic science. Chem A1.
2. Knowledge and understanding of areas of organic chemistry (organic functional groups, organic materials and compounds, synthetic pathways) as applied to chemistry and forensic science. Chem A3.
3. An ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to organic reaction mechanisms and to apply such knowledge and understanding to the solution of qualitative and quantitative problems. Chem B5.
4. An ability to recognise and analyse novel problems related to organic reactions and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data. Chem B6.
5. Ability to recognise and implement good measurement science and practice and commonly used chemistry and forensic laboratory techniques. Chem B4.
6. Skills in the safe handling of chemical materials, taking into account their physical and chemical properties, including any specific hazards associated with their use and to risk assess such hazards. Chem C9.
7. Skills required for the conduct of standard laboratory procedures involved in synthetic and analytical work in relation to organic systems. The systematic and reliable documentation of the above. The operation of standard instrumentation used in the chemical and forensic sciences in relation to organic systems. Chem C10.
8. Ability to interpret data derived from laboratory observations and measurements in terms of their underlying significance and the theory underpinning them. Chem C11.
9. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**

Have a knowledge and understanding of:

1. Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information. Chem D15.
2. Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches. Chem D17.
3. Interpersonal skills, relating to the ability to interact with other people and to engage in team working within a professional environment. Chem D19.
4. Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning. Chem D20.
5. Study skills needed for continuing professional development and professional employment. Chem D21.
6. **A synopsis of the curriculum**

You will study organic reactions and compounds encountered in organic chemistry in depth. In particular, you will look at the organic chemical reaction mechanisms (including aspects of physical organic chemistry) and the reactions of a variety of organic compounds. You will also look at carbon-carbon forming reactions and strategies for synthesising target molecules. (Lab component.)

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Core (Compulsory) Text for all Chemistry students taking CH504

* Organic Chemistry, Jonathan Clayden, Nick Greeves, Stuart G. Warren, 2nd Edition, 2012 (ISBN-10 0199270295)

It is expected and necessary that you read this textbook as an accompaniment to all lecture notes and coursework for CH309.

Recommended books (Should Read)

* March's advanced organic chemistry: reactions, mechanisms, and structure, Michael Smith, 7th edition, 2013 (ISBN-10 0470462590)
* Organic synthesis: the disconnection approach, Stuart G. Warren, Paul Wyatt, 2nd edition, 2008 (ISBN-13 9780470712368)
* Organic synthesis, Christine L. Willis, Martin Wills, 1995 (ISBN-10 0198557914)

Further texts may be recommended for individual topics.

1. **Learning and teaching methods**

Total contact hours: 70

Private study hours: 80

Total study hours: 150

1. **Assessment methods**
	1. Main assessment methods

Assignment 1 (2.5 hours, 3%)

Assignment 2 (2.5 hours, 3%)

Lab 1 (2.5 hours, 4%)

Lab 2 (2.5 hours, 4%)

Lab 3 (2.5 hours, 4%)

Lab 4 (2.5 hours, 4%)

Lab 5 (2.5 hours, 4%)

Lab 6 (2.5 hours, 4%)

Examination 2 hours (70%)

* 1. Reassessment methods

Like-for-like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* | *8.6* | *8.7* | *8.8* | *9.1* | *9.2* | *9.3* | *9.4* | *9.5* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lectures | **×** | **×** | **×** | **×** |  |  |  |  |  |  |  |  |  |
| Private Study | **×** | **×** | **×** | **×** |  |  |  |  | **×** | **×** |  | **×** | **×** |
| Laboratory | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Laboratory write ups | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** | **×** |  | **×** | **×** |
| Coursework  | **×** | **×** | **×** | **×** |  |  |  |  | **×** | **×** |  | **×** | **×** |
| Examination  | **×** | **×** | **×** | **×** |  |  |  |  | **×** |  |  | **×** | **×** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Science is an international subject with physical laws discovered and techniques developed and refined by scientists across the globe. Mastery of the subject-specific learning outcomes will equip students to apply the theories and techniques of this module in a wide range of international contexts. The module team is drawn from the School of Physical Sciences, which includes many members of staff with international experience of teaching and research collaboration. In compiling the reading list, consideration has been given to the range of texts that are available internationally and a selection of texts has been identified to complement the delivery of the material. The support SPS provides to its students is also internationally attuned given our international student body.

**FACULTIES SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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Revised FSO Jan 2018