1. **Title of the module**

CHEM5040 (CH504) – Organic Reaction Mechanisms

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

Division of Natural 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**

None

1. **The course(s) of study to which the module contributes**

Compulsory for BSc (Hons) Chemistry; BSc (Hons) Chemistry with a Foundation Year; BSc (Hons) Chemistry with a Year in Industry; MChem Chemistry.

Not available as an elective module choice.

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

8.1 Demonstrate knowledge and understanding of core and foundation scientific physical and chemical concepts, terminology, theory, units and conventions to chemistry and forensic science.

8.2 Demonstrate knowledge and understanding of areas of organic chemistry (organic functional groups, organic materials and compounds, synthetic pathways) as applied to chemistry and forensic science.

8.3 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.

8.4 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.

8.5 Recognise and implement good measurement science and practice and commonly used chemistry and forensic laboratory techniques.

8.6 Demonstrate confident 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.

8.7 Demonstrate 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.

8.8 Interpret data derived from laboratory observations and measurements in terms of their underlying significance and the theory underpinning them.

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

9.1 Demonstrate confident problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.

9.2 Demonstrate information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.

9.3 Demonstrate confident interpersonal skills, relating to the ability to interact with other people and to engage in team working within a professional environment.

9.4 Demonstrate assured 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.

9.5 Demonstrate study skills needed for continuing professional development and professional employment.

1. **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.

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

Clayden, J., Greeves, N., and Warren, S.G. (2012). *Organic Chemistry*, Second Edition. Oxford: Oxford University Press.

Smith, M. (2013). *March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure*, Seventh Edition. London: Wiley

Warren, S.G. and Wyatt, P. (2008). *Organic Synthesis: The Disconnection Approach*, Second Edition. London: Wiley

Willis, C.L. and Wills, M. (1995). *Organic Synthesis*. Oxford: Oxford University Press.

1. **Learning and teaching methods**

Total Contact Hours: 70

Total Private Study Hours: 180

Total Study Hours: 150

1. **Assessment methods**
	1. Main assessment methods
* Assignment 1 (2.5 hours) – 3%
* Assignment 2 (2.5 hours) – 3%
* Lab Write-ups (2.5 hours each) – 24%
* Examination (2 hours) – 70%

The lab write-ups are compulsory sub-elements and must be passed to complete the module.

13.2 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** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** |  |  |  |  | **x** | **x** |  | **x** | **x** |
| Lecture | **x** | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |
| Laboratory Practical | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Assignments | **x** | **x** | **x** | **x** |  |  |  |  | **x** | **x** |  | **x** | **x** |
| Laboratory Write-ups | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Examination | **x** | **x** | **x** | **x** |  |  |  |  | **x** |  |  | **x** | **x** |

1. **Inclusive module design**

The Division 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 Division of Natural 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 the Division provides to its students is also internationally attuned given our international student body.

**DIVISION USE ONLY**

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

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