1. KentVision Code and title of the module

CHEM6240 – Transformations and Chirality in Organic Chemistry

## Division and School/Department or partner institution which will be responsible for management of the module

Division of Natural Sciences (Chemistry and Forensic Science)

## The level of the module (Level 4, Level 5, Level 6 or Level 7)

Level 6

## The number of credits and the ECTS value which the module represents

15 Credits (7.5 ECTS)

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

Autumn

## Prerequisite and co-requisite modules and/or any module restrictions

Prerequisites: CHEM3090 (Fundamental Organic Chemistry for Physical Scientists), CHEM3820 (Chemical Skills), PSCI3810 (Chemical Skills for Forensic Scientists), and CHEM3140 (Introduction to Biochemistry and Drug Chemistry)

Co-requisite: CHEM5060 (Chemical Identification Techniques)

## The course(s) of study to which the module contributes

Compulsory for the following courses:

BSc (Hons) Chemistry

MChem Chemistry

Optional for the following courses:

BSc (Hons) Forensic Science

MSci Forensic Science

Not available as an elective module

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

8.1 Demonstrate thorough knowledge and understanding of core and foundation scientific chemical, concepts, terminology, theory, and methods in relation to the chemical sciences.

8.2 Demonstrate detailed knowledge and understanding of areas of chemistry including properties of chemical elements, organic functional groups, physiochemical principles, organic reactivity, organic materials, and synthetic pathways.

8.3 Demonstrate appreciation of developments at the forefront of some areas of chemical sciences relating to organic chemistry.

8.4 Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject and to apply such knowledge and understanding to the solution of qualitative and quantitative problems.

8.5 Recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.

8.6 Collate, interpret and explain the significance and underlying theory of experimental data pertaining to: classes of chirality and chirality resolution; chiral synthesis: carbonyls, auxiliaries, protecting groups, oxidation, enolate and aldol reactions; chemistry of double bonds: pericyclic reactions, frontier orbital theory, Woodward Hoffman rules; classical heterocyclic syntheses; targeted synthesis of topical organic molecules

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

9.1 Demonstrate a broad range of communication skills.

9.2 Demonstrate the generic skills needed for students to undertake further training of a professional nature.

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

9.4 Demonstrate effective 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.

## A synopsis of the curriculum

A key component to chemical education is the exposure to more advanced aspects of chirality, and chemical transformations towards the synthesis of organic targets. Concepts relating to the synthesis of natural and unnatural target molecules through organic chemical transformations are essential to the students’ chemical repertoire. In-depth exposure to chirality, exposure to asymmetric chemical transformations, carbon-carbon bond-forming reactions, and their application in targeted small molecule synthesis will be covered.

## Reading list

## The University is committed to ensuring that core reading materials are in accessible electronic format in line with the Kent Inclusive Practices.

## The most up to date reading list for each module can be found on the university's [reading list pages](https://kent.rl.talis.com/index.html).

## Contact Hours

Private Study: 124

Contact Hours: 26

Total: 150

## Assessment methods

13.1 Main assessment methods

* Assignment 1 (3 hours) – 20%
* Assignment 2 (3 hours) – 20%
* Examination (3 hours) – 60%

13.2 Reassessment methods

* Like-for-like

## Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section 12) and methods of assessment (section 13)

**Module learning outcomes against learning and teaching methods:**

| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 9.1 | 9.2 | 9.3 | 9.4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lecture | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Workshop | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

**Module learning outcomes against assessment methods:**

| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 9.1 | 9.2 | 9.3 | 9.4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assignment 1 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Assignment 2 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Examination | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

## 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

## Campus(es) or centre(s) where module will be delivered

Canterbury

## Internationalisation

Science is an international discipline with widely applicable international resonance. This module presents subject-specific knowledge generated, developed, and refined by scientists around the world. Mastery of the learning outcomes will equip students to apply the knowledge in a wide range of international contexts and these will be addressed in making the content relevant to current global issues. The Division of Natural Sciences is an international community of students and staff and group activities and teaching will provide a platform for internationally-focussed discussion.

**DIVISIONAL USE ONLY**

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

| Date approved | New/Major/minor revision | Start date of delivery of (revised) version | Section revised  (if applicable) | Impacts PLOs (Q6&7 cover sheet) |
| --- | --- | --- | --- | --- |
| 9 Dec 2021 | Minor | Sept 2022 | 5, 12-13 | No |
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| Revised FSO Jan 2018 |