

Advanced Topics in Chemistry: Organic Synthesis

Module Code:	CFS7001-A
Academic Year:	2018-19
Credit Rating:	10
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry and Forensic Science (ceases 2016)
FHEQ Level:	FHEQ Level 7 (Masters)
Module Leader:	Professor Richard Bowen

Additional Tutors:
Dr Kamyar Afarinkia

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	20
Tutorials	4
Directed Study	74.5
Examinations DO NOT USE	1.5

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Semester 1 (Sep - Jan)

Module Aims

- (i) Introduce students to the problems encountered in organic synthesis and the strategic and tactical methods used to overcome these problems.
- (ii) To explain and present some of the most important asymmetric reactions and to apply these principles to the stereo selective total synthesis of important compounds.

Outline Syllabus

Stereoselective synthesis: Important asymmetric reactions: Non-stereodifferentiating methods, first-generation methods.

(i) nucleophiles and electrophiles bearing a chiral auxiliary

(ii) chiral auxiliaries in concerted reactions: Diels Alder cycloaddition, Claisen-Cope rearrangement. Third and fourth-generation methods: C-C bond forming reactions, chiral acids and bases, asymmetric oxidation, reduction, isomerisation, hydroboration, enzymatic and microbial methods. Asymmetric total synthesis.

Strategies for Organic Synthesis: Tactical options, including control, protection, and activation and blocking techniques. Alkylation of enolates and their equivalents, particularly enamines. Rearrangements as a means of constructing ring systems: Bifunctional compounds; 1,3-, 1,4-, 1,5- and 1,6-di-CO disconnections; Claisen, Aldol, Michael and Mannich reactions; Robinson annelation; Diels-Alder reaction.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 Critically evaluate the range of problems in organic synthesis and the tactics, which may be used to overcome them.
- 2 Appraise the significance of asymmetric synthesis.
- 3 Design synthetic routes to molecules of moderate complexity using retrosynthetic methodology.

Learning, Teaching and Assessment Strategy

Lectures and seminars. Students will be given areas of the syllabus for independent study and will be required to submit appropriate coursework. Feedback will be given in seminars.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - closed book	1.5 hour written examination	1.5 hours	70%	Yes
Summative	Coursework	Critical review (1000 words)	0 hours	30%	No

Legacy Code (if applicable)

CT-4007M

Reading List

To view Reading List, please go to [rebus:list](#).

