UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title:	Synthetic Chemistry for Medicinal Chemists (Distance Learning)
Module Code:	CFS7021-B
Academic Year:	2019-20
Credit Rating:	20
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry
FHEQ Level:	FHEQ Level 7 (Masters)
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	**Hours**
Tutorials	4
Directed Study	196

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

Module Aims

This module will develop your knowledge of organic chemistry and show you how organic synthesis is employed in the development of new drug leads. You will learn about some more advanced reactions, specifically those aimed at making molecules as single enantiomers. Combinatorial approaches, and diversity orientated synthesis (DOS) will also be covered.

Outline Syllabus

How to design a synthetic route: Retrosynthesis revisited: Simple disconnections leading to drug like molecules - specifically heterocyclic compounds and aromatics. Tactics in synthesis - 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.

The constraints of the industrial scale: process development, solvents, and reaction conditions, 'green' considerations, health and safety, economics, length of route.

Molecules as single enantiomers: the chiral pool; asymmetric and diastereoselective reactions. To include examples from enzyme mediated transformations, asymmetric hydrogenations and reagent controlled stereocontrol.

Developing a library of compounds, simple transformations leading to diversity. Strategies for designing a library (i.e. making sure enough chemical space is sampled, avoiding multiple, similar compounds)

Drugs that have made it to market: to include examples from rational design, and examples of natural products that have been modified.

Learning Outcomes

1	Critically analyse a given synthetic route from an industrial perspective.
2	Critically evaluate retrosynthetic routes to drug-like molecules.
3	Rationalise asymmetric transformations leading to single enantiomers of molecules.
4	Evaluate synthetic routes to molecules that have made it to market.

Learning, Teaching and Assessment Strategy

This module will be taught at distance. The VLE will be used to deliver core content, which will be made available at the start of the course. Recordings of lectures will be made available on the VLE as they are delivered.

The VLE will also be used to provide access to online resourcesand external links to websites of interest. Course tutors will be available to answer your queries on course materials at times to be specified in the module handbook. On-line tutorial sessions will be arranged where you will have the opportunity to discuss course content with your peers and course tutors.

Assessment 1: You will complete worksheets over the course of the module to aid your understanding. Feedback will be given.
Assessment 2: Summative examination to cover the whole module.

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - closed book	Summative assessment: closed book exam	2 hours	60%
Summative	Coursework	Worksheets	0 hours	40%

Reading List

To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html.

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.