UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Synthetic Chemistry for Medicinal Chemists (Distance Learning)
Module Code	CFS7021-B
Academic Year	2021/2
Credits	20
School	School of Chemistry and Biosciences
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Online Tutorials (Synchronous)	8
Directed Study	168
Interactive Learning Objects	12
Lectures	4

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

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.

Outline Syllabus

Strategies and tactics in design of synthetic routes: control, protection, and activation and blocking techniques, chemical space considerations, availability of starting materials and exploitation of symmetry.Retrosynthesis revisited: Simple disconnections leading to drug like molecules - specifically heterocyclic compounds and aromatics. 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.Molecules as single enantiomers: the chiral pool; asymmetric and diastereoselective reactions, first generation transition metal catalysis. Examples from enzyme mediated transformations, reagent control (e.g. Brown allylation), chiral auxiliaries (e.g. Evans) and organo-catalysts.Applications: constraints of the industrial scale: process development, solvents, and reaction conditions, 'green' considerations, health and safety, economics, length of route, application of synthetic chemistry to known drug molecules and APIs with discussion of developing a library of compounds, with modern synthetic methods.

Learning Outcomes	
Outcome Number	Description
01	Critically analyse a given synthetic route from an industrial perspective.
02	Critically evaluate retrosynthetic routes to drug-like molecules.
03	Rationalise asymmetric transformations leading to single enantiomers of molecules.
04	Evaluate synthetic routes to molecules that have made it to market.

Learning, Teaching and Assessment Strategy
Assessment 1: Worksheets over the course of the module to aid your understanding. Feedback will be given (LOs 1-4).Assessment 2: Summative examination to cover the whole module (LOs 1-4).

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Worksheets	40%
Summative	Examination - Closed Book	Summative assessment: closed book exam (2 Hrs)	60%

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.

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