

Module Details	
Module Title:	Organic Chemistry 1
Module Code:	CFS4023-B
Academic Year:	2019-20
Credit Rating:	20
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry
FHEQ Level:	FHEQ Level 4
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	40
Tutorials	6
Directed Study	154

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims
<p>This module will introduce you to undergraduate level organic chemistry. Organic chemistry has its own language, and way of presenting information. By the end of this module you will be confident in using the language of organic chemistry to discuss the path of simple reactions. Through lectures, workshops and tutorial sessions you will develop your understanding and appreciation of organic chemistry.</p>

Outline Syllabus
<p>The language of organic chemistry: Drawing organic compounds, functional groups and nomenclature.</p>

Isomerism: Conformation and configuration, enantiomers and diastereoisomers.

Mechanism: Orbitals and hybridisation, curly arrows, electrophiles, radicals and nucleophiles, reactive intermediates and transition states, inductive, mesomeric and hyperconjugation effects, strength of nucleophiles and electrophiles, carbocation stabilities, rearrangements, pKa.

Analytical tools for organic chemistry: IR spectra of functional group containing compounds. Introduction to mass spectrometry. Origins and applications of proton and carbon NMR spectra. Elucidating structures from spectra.

Classification of reactions and reaction selectivity: Acid-base reactions, oxidation and reduction, polar addition and polar substitution, radical reactions and pericyclic reactions. Substitution and elimination, the concepts of chemo-, regio- and stereoselectivity.

Alkanes, alkenes and alkynes: Nucleophilic substitution and elimination, leaving groups and the relation to pKa, the course of the SN1 and SN2 reactions. Elimination reaction mechanisms E1 and E2, Saytzev versus Hoffman. Electrophilic addition, Radical addition, Epoxidation and simple pericyclic reaction.

Carbonyl chemistry – Reaction and structure of aldehydes and ketones, carboxylic acids, esters, acetals, ketals and imines.

Reaction and structure of alcohols, thiols, ethers, sulfonate esters and amines.

Introduction to organometallics 1: Grignard and organocuprate additions to carbonyl compounds, conjugate addition.

Learning Outcomes

1	Apply nomenclature and chemical notation to describe the structure of organic molecules and their reactions.
2	Interpret the reactivity of molecules and intermediates based on their electronic properties.
3	Use reaction mechanism to rationalise the outcome of simple organic reactions.
4	Propose starting materials, reaction conditions and products for several representative organic reactions.
5	Interpret data and propose chemical structures based on FTIR, ¹ H, ¹³ C, IR and MS data.
6	Develop team-based problem solving skills in the application of analytical techniques.

Learning, Teaching and Assessment Strategy

Lectures will deliver core content; providing you with the opportunity to acquire the information to enhance your knowledge and understanding of basic undergraduate-level organic chemistry. This will be complemented by seminars, group discussions and tutorials to allow you to apply this learning to specific exemplar problems.

You will work in a group to analyse spectroscopic data.

Directed study provides you with the opportunity to undertake guided reading and to develop your own portfolio of learning to enhance transferable skills and knowledge relating to evaluation of own role and subject provision.

The VLE will be used to provide access to online resources, lecture notes and external links to

websites of interest.

Assessment 1: A coursework exercise will cover LO's 5 and 6.

Assessment 2: A classroom test will cover LO's 1, 2 and 5.

Assessment 3: Summative examination in May to cover the whole module, apart from LO 6.

Mode of Assessment				
Type	Method	Description	Length	Weighting
Summative	Examination - closed book	Summative assessment: closed book examination	2 hours	50%
Summative	Coursework	In-class problem solving exercise		20%
Summative	Classroom test	Closed book classroom test	1 hour	20%
Summative	Classroom test	Worksheets		10%

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.