

Module Details	
Module Title	Organic Chemistry 1
Module Code	CFS4023-B
Academic Year	2024/5
Credits	20
School	School of Chemistry and Biosciences
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Practical Classes or Workshops	7
Interactive Learning Objects	10
Tutorials	6
Directed Study	145
Lectures	32

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

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.</p> <p>Through lectures, workshops and tutorial sessions you will develop your understanding and appreciation of organic chemistry.</p>

Outline Syllabus

The language of organic chemistry: Drawing organic compounds, functional groups and nomenclature.

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 reactions. 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, Grignard and organocuprate additions to carbonyl compounds, conjugate addition.

Learning Outcomes

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

Learning, Teaching and Assessment Strategy

The module uses a blended approach to support learning and achievement. Students will engage with a series of weekly online learning packages. These will include short videos that address key concepts, a set of structured activities (reading, online discussions etc.) that scaffold the the learning, and a range of formative tasks that generate feedback on progress. Students will also engage in a series of on-campus tutorials. Online sessions (tutorials/discussions) will also be used to support learning and monitor progress as students move through the curriculum.

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 your 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: An individual presentation (8 + 2 minutes)

Assessment 2: A take home problem solving assessment cover whole module

Assessment 3: Summative examination in May to cover the whole module

Mode of Assessment

Type	Method	Description	Weighting
Summative	Presentation	Individual presentation (8 + 2 minutes)	25%
Summative	Coursework - Written	Take home problem solving assessment (1000 words)	25%
Summative	Computerised examination	Closed book computerised examination (90 minutes)	50%

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.