

Organic Chemistry 1 (at distance)

Module Code:	CFS4028-B
Academic Year:	2018-19
Credit Rating:	20
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry
FHEQ Level:	FHEQ Level 4
Module Leader:	Dr William Martin

Additional Tutors:
Dr Philip Drake

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	40
Tutorials	4
Directed Study	156

Availability Periods

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

Module Aims

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 a range of online materials and activities you will develop your understanding and appreciation of organic chemistry.

Outline Syllabus

The language of organic chemistry: Drawing organic compounds, Functional groups, nomenclature, isomerism, assigning R and S stereochemistry, simple conformational analysis.

Mechanism: Hybridisation and curly arrows, electrophiles, radicals and nucleophiles, reactive intermediates and transition states, electron distributions-inductive, resonance and hyperconjugation effects, strength of nucleophiles and electrophiles, carbocation stabilities rearrangements, pKa.

Analytical tools for organic chemistry: Revision of ^1H and ^{13}C NMR, introduction to mass spectrometry and IR.

Introduction to reactions - classification of reactions and reaction selectivity: Acid-base reactions, polar addition and polar substitution, radical reactions and pericyclic reactions. Substitution and elimination, structure of haloalkanes, halogenation. The concepts of chemo, regio and stereoselectivity.

Nucleophilic substitution and elimination: Leaving groups and the relation to pKa, the course of the $\text{S}_{\text{N}}1$ and $\text{S}_{\text{N}}2$ reactions, stereochemical implications of the $\text{S}_{\text{N}}1$ and $\text{S}_{\text{N}}2$ reactions. Elimination reaction mechanisms $\text{E}1$ and $\text{E}2$, Saytzev versus Hoffman.

Alkenes and alkynes: Electrophilic addition, Radical addition, Epoxidation and simple pericyclic reaction.

Module Learning Outcomes

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

- 1
 - 1.1 - Present accurate drawings of organic molecules, and name them systematically.
 - 1.2 - Rationalise that any given molecule can have several isomers and be able to assign these isomers.
 - 1.3 - Interpret the reactivity of molecules and intermediates based on their electronic properties.
 - 1.4 - Rationalise the outcome of $\text{S}_{\text{N}}1$, $\text{S}_{\text{N}}2$, $\text{E}1$ and $\text{E}2$ reactions.
 - 1.5 - Propose a fully annotated mechanism for simple organic reactions.
 - 1.6 - Propose starting materials, reaction conditions and products for several representative organic reactions.
 - 1.7 - Discuss the chemistry of alkenes.
- 2
 - 2.1 - Converse using the language of organic chemistry.
 - 2.2 - Interpret data and propose chemical structures based on ^1H , ^{13}C , IR and MS data
- 3
 - 3.1 - Develop problem solving skills
 - 3.2 - Work in a group to analyse data.

Learning, Teaching and Assessment Strategy

This module will be delivered using a 'flipped' learning and teaching strategy: this means you will be provided with taught material which you will need to study before the class takes place. This material will be presented in a range of media including podcasts, vodcasts, and directed reading and will be delivered through the University's VLE. On-line activities such as quizzes, discussions and wikis will support the taught material.

The majority of classes will be hosted and facilitated online using collaborative software.

These sessions will require you to use the knowledge you have gained through completion of the pre-work and apply it to real world problems in the discipline of organic chemistry. Furthermore, the problems will require you to take a collaborative approach to solving them, helping you develop key employability skills in a peer-learning environment.

You will interact with your course tutor and other group members on a regular, timetabled basis which will be supported via teleconferencing facilities. In these sessions, your group will be encouraged to explore both the core content and reflect on your approach to solving problems.

Your active engagement with the online discussions and activities will be crucial to success in this module and evaluation of engagement will inform the support you receive from your Supervisory Team.

The assessment strategy will help you engage with the theory and practice of organic chemistry.

Assessment 1: A coursework exercise will cover LOs 1.1, 2.2, 3.1. This is a group exercise that you will undertake in your course tutor group. Formative feedback will be provided on previous group problem solving activities that you have undertaken as part of the module.

Assessment 2: An on-line assessment task in January will cover material from semester 1. Covers LOs 1.2, 1.3, 2.1, 2.2.

Assessment 3: Summative examination in Bradford at the end of the academic year to cover the whole module, apart from LOs 3.2.

Formative feedback for assessments 2 and 3 will be provided through the tutorial sessions where your answers to questions will be discussed.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - closed book	Summative exam, taken in Bradford	2 hours	50%	Yes
Summative	Coursework	Group problem solving exercise	1 hour	30%	No
Formative	Coursework	Tutorial sheets		%	No
Summative	Computer-based assessment	Remote, on-line assessment	1 hour	20%	No

Legacy Code (if applicable)

Reading List

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