UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Organic Chemistry 3 (at distance)
Module Code	CFS6025-B
Academic Year	2022/3
Credits	20
School	School of Chemistry and Biosciences
FHEQ Level	FHEQ Level 6

Contact Hours	
Type	Hours
Directed Study	165
Online Lecture (Synchronous)	12
Online Lecture (Asynchronous)	23
Online Lecture (Asynchronous)	This module will broaden your appreciation of organic chemistry to consider the reactions of compounds containing second row elements (silicon, phosphorus and sulphur). You will be introduced to photochemistry and the chemistry of the excited state. This will lead to an understanding of the basis of radical chemistry and reactive intermediates. The second half of the module will focus on the mechanistic interpretation of apparently complex processes.
Online Lecture (Asynchronous)	Beyond carbon: Silicon, phosphorous and sulfur in organic chemistry. Organometallics II, organometallic chemistry 2 chemistry - The Suzuki, Sonogoshira and Heck couplings, directed ortho-metallation, C-H activation. Metathesis. Photochemistry, triplet and singlet states, Paterno-Buchi reaction. Non-classical cations and their chemistry. Reactive intermediates, carbenes, nitrenes and radicals in organic chemistry. Rearrangements and orbital symmetry controlled processes; constructing a set of molecular orbitals, Woodward-Hoffmann rules, pericyclic reactions, with particular emphasis on Diels-Alder reaction, frontier orbital approach to understanding pericyclic processes. Advanced transition state theory, the kinetic isotope effect. Linear free energy relationships in physical organic chemistry.
Online Lecture (Asynchronous)	Lectures will deliver core content and will be complemented by seminars, group discussions and online tutorials to allow students to apply this learning to specific exemplar problems. Directed study provides students with the opportunity to undertake guided reading and to develop their own portfolio of learning to enhance transferable skills and knowledge relating to evaluation of own role and subject provision.
Online Lecture (Asynchronous)	Assessment 1 will involve a group exercise. Groups will be given a synthesis paper from the literature and will be tasked with analysing the role of second row elements in the route. A commentary on the paper will then be produced by the group from this perspective. This will assess LO1. Assessment 2 is a final summative exam covering all LOs.

Availability	
Occurrence	Location / Period
DLA	University of Bradford / Semester 2

Module Aims

This module will broaden your appreciation of organic chemistry to consider the reactions of compounds containing second row elements (silicon, phosphorus and sulphur). You will be introduced to photochemistry and the chemistry of the excited state. This will lead to an understanding of the basis of radical chemistry and reactive intermediates. The second half of the module will focus on the mechanistic interpretation of apparently complex processes.

Outline Syllabus

Beyond carbon: Silicon, phosphorous and sulfur in organic chemistry. Organometallics II, organometallic chemistry 2 chemistry - The Suzuki, Sonogoshira and Heck couplings, directed ortho-metallation, C-H activation. Metathesis.
Photochemistry, triplet and singlet states, Paterno-Buchi reaction. Non-classical cations and their chemistry. Reactive intermediates, carbenes, nitrenes and radicals in organic chemistry. Rearrangements and orbital symmetry controlled processes; constructing a set of molecular orbitals, Woodward-Hoffmann rules, pericyclic reactions, with particular emphasis on Diels-Alder reaction, frontier orbital approach to understanding pericyclic processes. Advanced transition state theory, the kinetic isotope effect. Linear free energy relationships in physical organic chemistry.

Learning Outcomes

Outcome Number	Description
1.1	Categorise the use of second row elements in synthesis.
1.2	Evaluate the use of organometallic reagents in organic synthesis.
1.3	Evaluate the role of reactive intermediates in complex mechanisms.
1.4	Apply orbital symmetry considerations and advanced transition state theory in rationalising the outcome of complex mechanisms .
1.5	Analyse reactions in terms of linear free energy relationships. .

Learning, Teaching and Assessment Strategy

Lectures will deliver core content and will be complemented by seminars, group discussions and online tutorials to allow students to apply this learning to specific exemplar problems. Directed study provides students with the opportunity to undertake guided reading and to develop their own portfolio of learning to enhance transferable skills and knowledge relating to evaluation of own role and subject provision.

Assessment 1 will involve a group exercise. Groups will be given a synthesis paper from the literature and will be tasked with analysing the role of second row elements in the route. A commentary on the paper will then be produced by the group from this perspective. This will assess LO1.
Assessment 2 is a final summative exam covering all LOs.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Examination - Closed Book	Examination (3 Hrs)	70%
Summative	Coursework - Patchwork Assessment	Group exercise literature review / commentary (1000 word equivalent)	30%

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.

---

https://bradford.ac.uk