

Module Details	
Module Title:	Chemistry for Engineers
Module Code:	CHE5001-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Chemical Engineering
Subject Area:	Chemistry
FHEQ Level:	FHEQ Level 5
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	22
Practical classes and workshops	14
Laboratory	12
Directed Study	152

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

Module Aims
To introduce models describing bond formation between atoms and relate these to the physical chemical properties of simple molecules. To provide experience of laboratory techniques through examples of organic separations and introduce common methods for characterisation of organic chemicals. To design synthetic chemistry experiments, carry them out and then test the results using modern analytical equipment. To train students in the preparation of laboratory reports and introduce the standard formats used by professional chemists.

Outline Syllabus

Organic structures: hydrocarbon frameworks and functional groups, Naming compounds. Organic reactions: mechanisms. Delocalisation and conjugation: allyl systems, molecules with more than one C-C bond. Stereochemistry: three dimensional shape of molecules, molecules with symmetry, diastereoisomers. Conformational Analysis. Specialist chemistry search engines - Reaxys. Introductory to the chemistry laboratory - standard glassware. Extractions and recrystallisations.

Learning Outcomes

1	Explain how types of chemical bonding in organic molecules influence structure and reactivity of molecules.
2	Name organic molecules and describe the stereochemistry of simple molecules.
3	Use chemical search engines to identify suitable chemical reactions for use in the laboratory.
4	Conduct simple experiments in the chemistry lab
5	Present chemical information and interpret its meaning
6	Demonstrate contribution to a team

Learning, Teaching and Assessment Strategy

Lectures, staff-led seminars, formative assessment, online formative assessment and tutorials. Laboratory-based work will include staff-led demonstration of practical and manipulative skills at the bench and supervision of students' experimental work. Chemical search skills will be taught through doing using hands-on sessions.

The Learning strategy is to develop skills and knowledge through active learning activities. In line with CDIO principles. The learning strategy harnesses active learning and experiential learning as key drivers. The module will finish with a design and build challenge supported by targeted interactive workshops, in which students will 'design' and then 'build' a synthetic route to an organic molecule.

The first part of the modules is knowledge-rich and will be assessed using an in-class assessment. To cover LOs 1 and 2.

The second half of the module will be group based, and the assessment will be linked to the CDIO project. Each group will be assessed based on the effectiveness of the project to meet the project brief, design quality and build - as measured by physical and spectroscopic data of the synthetic product, with a detailed justification of design, materials, and synthetic methodologies taking into account sustainability implications of the project. Students will need to demonstrate lessons learned in all aspects of the work during the presentation stage. A peer evaluation, formative and summative, of participation and commitment to the projects will form part of the assessment.

- Group demonstration/Presentation of the deliverable (the synthesis), including summative peer assessment of members in the same group as well as peer assessment between the multidisciplinary groups

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Presentation	Poster presentation	20 minutes	50%

		with peer assessment of contribution		
Summative	Classroom test	Mid term assessment (MCQ)	1 hour	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.