

Module Specification

Module Title Module Code
Credit Value Level Mode of Delivery Semester B

Pre-requisite modules	Co-requisite modules	Overlapping modules
CHE302 Organic Synthesis		

1) Content Description

Provide a description of the module, as it will appear in the Module Directory and on the Student Information System (approx. 70-80 words).

This module reviews the chemistry of some important biomolecules, including: peptide chemistry (the synthesis, properties and reactions of amino acids, and their combination to give peptides); sugar chemistry (sugar nomenclature, sugar protection protocols and synthetic manipulations); nucleosides and nucleotides (representation of DNA and RNA structures, the significance of the purine and pyrimidine ring systems noncovalent interactions, and an introduction to the synthesis and sequencing of oligonucleotides)..

2) Module Aims

Specify the aims of the module, i.e. the broad educational purposes for offering this module.

To provide an understanding of the chemistry of some important biomolecules (amino acids, peptides, sugars, nucleosides and nucleotides) and methods for their chemical synthesis.

3) Learning Outcomes

Identify the learning outcomes for this module, i.e. knowledge, skills and attributes to be developed through completion of this module. Outcomes should be referenced to the relevant [QAA benchmark statements](#) and the [Framework for Higher Education Qualifications in England, Wales and Northern Ireland \(2008\)](#). The [SEEC Credit Level Descriptors for Further and Higher Education 2003](#) and [Queen Mary Statement of Graduate Attributes](#) should also be used as a guiding framework for curriculum design.

Academic Content:	
A 1	Basic chemistry and properties of amino acids, peptides and sugars.
A 2	Methods for the synthesis of amino acids, peptides and sugars.
A 3	Use and importance of protecting groups in the synthesis of oligo-peptides, -saccharides and -nucleotides.
A 4	Aspects of heteroaromatic chemistry (purine, pyrimidine bases)
A 5	Key features of nucleic acids; how structure and non-covalent interactions contribute to the form and function of DNA

Disciplinary skills - able to:

B1	Predict and rationalize the outcome of synthetic steps based on the starting materials and reagents.
B2	Provide reagents and conditions for the conversion of a starting material to a given product.
B3	Use curved arrow notation to write reasonable mechanisms for all of the reaction types discussed in the module and to rationalize the outcome, including stereochemical outcome, of specific synthetic
B4	Solve multi-step synthetic problems to deliver suitably-protected amino acid, monosaccharide or nucleotide building blocks.
B5	Design syntheses of oligomeric biological molecules (oligo-peptides, -saccharides, and -nucleotides) including appropriate protecting group strategies.

Attributes:	
C1	Acquire and apply knowledge relating to the principles and practice of organic chemistry
C2	Produce analyses which are grounded in experimental evidence (e.g. spectroscopic data)
C3	Apply existing knowledge and skills to investigate unfamiliar problems.

4) Reading List

Provide an indicative reading list for the module. This should include key texts and/or journals but **should not** be an exhaustive list of materials.

J Clayden, N Greeves and S Warren, Organic Chemistry, 2nd ed., OUP (2012)
 B, G. Davis, A. J. Fairbanks, Carbohydrate Chemistry, OUP (2002)
 J. Jones, Amino Acids and Peptide Synthesis, 2nd ed., OUP (2002)

5) Teaching and Learning Profile

Provide details of the method of delivery (lectures, seminars, fieldwork, practical classes, etc.) used to enable the achievement of learning outcomes and an indicative number of hours for each activity to give an overall picture of the workload a student taking the module would be expected to undertake. This information will form the Key Information Set for each undergraduate programme and will be used to populate the KIS widget found on the QMUL programme information pages. More information can be found [online](#) about KIS. You may also wish to refer to the [QAA guidance on contact hours](#) when completing this section.

Activity Type	KIS Category	Time Spent (in hours)
Lecture	Scheduled	22
Practical Classes and Workshops	Scheduled	8
Total		150

Specify the total module notional study hours. This should be a total of the hours given for each activity. The notional study hours for each academic credit point is 10. A 15 credit point module therefore represents 150 notional study hours.

Activity Type	Total Time Spent (in hours)	Percentage of Time Spent
Scheduled learning and teaching	30	20
Placement	0	0
Independent Study	120	80
Total	150	100

Use the information provided in the box above to specify the total time spent and the percentage time spent in each category of teaching and learning activity.

6) Assessment Profile

Provide details of the assessment methods used to assess the achievement of learning outcomes.

Description of Assessment	Assessment Type	KIS Category	Duration/Length	Percentage Weighting	Final element of assessment	Qualifying Mark
Coursework	Written Assignment, inc Essay	Coursework		10%	No	
Examination	Written Exam	Written	2.5 hours	90%	Yes	

Final element of assessment: The assessment that takes place last. **There should normally be only one element of assessment marked as final unless two assessment or submission dates occur on the same day.**

Qualifying mark: A specified minimum mark that must be obtained in one or more elements of assessment in order to pass a module. **This is in addition to, and distinct from, the requirement to achieve a pass in the module mark to pass the module.**

Reassessment

Provide details of the reassessment methods used, specifying whether reassessment is either standard reassessment or synoptic reassessment.

- Standard Reassessment
 Synoptic Reassessment

Synoptic reassessment details (if you have indicated synoptic reassessment above, please give details)		
Brief Description of Assessment	Assessment Type	Duration/Length of Examination/ Coursework
Resit Examination	Written Exam	2.5 hours