

Section 2 - Module Specification

Module Title Module Code

Credit Value Level Mode of Delivery Semester

Pre-requisite modules	Co-requisite modules	Overlapping modules
CHE302 Organic Synthesis CHE307 Bioorganic Chemistry		

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 focuses on the role of organic compounds in the natural world, with particular reference to biological and pharmaceutical systems. The role of synthetic models for biological systems is examined critically. The aim is to rationalise the properties and reactivity of the principal classes of natural products and to demonstrate the fundamental chemistry behind biochemical reactions in biosynthetic pathways. Major biosynthetic pathways leading to the formation of secondary metabolites are examined from the mechanistic point of view.

2) Module Aims

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

At the end of this module the student should have in-depth knowledge of a range of biosynthetic pathways and appreciate how an understanding of biosynthetic pathways is important in the modern pharmaceutical industry.

Students should also be able to answer the MSci "depth" questions on biological chemistry as defined by the Royal Society of Chemistry by the end of this module.

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:	
A1	Terpenes and steroids - the mechanism for geranyl pyrophosphate formation - how geranyl pyrophosphate units combine to form linear precursors - how linear terpenes cyclise and subsequently rearrange to give a variety of terpenes and steroids.
A2	Shikimates -the importance of the shikimic acid pathway and the role of the different pathways that can be followed.
A3	Flavinoids - how shikimate and polyketides pathways combine to give flavinoids
A4	Fatty acids - mechanisms by which saturated fatty acids are produced. - mechanisms by which unsaturated fatty acids are produced. - how unsaturated fatty acids react to produce prostaglandins and leukotrienes.
A5	Lipids -how fatty acids are converted to lipids and sphingolipids.
A6	Polyketides - how acetylSCoA subunits are combined to form simple polyketo chains - how polyketo chains condense to give aromatic polyketides. - how macrolides are produced.
Disciplinary Skills - able to:	
B1	Analyse a small natural product and predict how it would be biosynthesised.
B2	Predict which natural product will be produced from a given set of biosynthetic machinery.
B3	Explain how modern genomic modifications can produce unnatural products of pharmaceutical interest.
B4	Use curved arrows notation to write mechanisms for all the reactions discussed in this module.
Attributes:	
C1	Acquire and apply knowledge relating to the art of biological chemistry.
C2	Produce in depth analyses which are grounded in experimental evidence (e.g. spectroscopic data).
C3	Apply existing knowledge and skills to investigate unfamiliar advanced 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.

'Chemical Aspects of Biosynthesis' by John Mann, OUP, 1994

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		30

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		
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.

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	% Weighting	Final element of assessment?	Qualifying Mark
Examination	Written Exam	Written	2.5 hours	90	Yes	
Coursework	Written Assignment	Written		10		

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

Section 3 - Alternative Assessment Arrangements for Associate Students

This section **must only** be completed if the module will be made available to associate students in Semester A and where the credit value of the "associate" version is the same as for the main version, and the main version is assessed by exam in May which is not available to the associate students. All other aspects of the module specification remain the same as indicated in Section 2 above. To add alternative assessment arrangements please click 'Add Alternative Assessment'.

Section 4a - Half Module for Associate Students (for a half module to be taught in Semester A)

This section must be completed if the proposed module will take place over 2 semesters but will be made available to single-semester associate students in a half-credit format in **Semester A**. Modules worth less than 30 credits taken over 2 semesters may not be made available in a half-credit format. To add details for the half module please click 'Add Half Module (Semester A)'.

Section 4b - Half Module for Associate Students (for a half module to be taught in Semester B)

This section must be completed if the proposed module will take place over 2 semesters but will be made available to single-semester associate students in a half-credit format in **Semester B**. Modules worth less than 30 credits taken over 2 semesters may not be made available in a half-credit format. To add details for the half module please click 'Add Half Module (Semester B)'.