

CHEO7003: Topics in Organic Chemistry

Module Details

Module Code:	CHEO7003
Title:	Topics in Organic Chemistry APPROVED
Long Title:	Topics in Organic Chemistry
NFQ Level:	Intermediate
Valid From:	Semester 1 - 2023/24 (September 2023)
Duration:	1 Semester
Credits:	5
Field of Study:	4423 - Organic Chemistry
Module Delivered in:	2 programme(s)
Module Description:	This module further develops concepts such as reaction mechanisms, syntheses and processes in the production of organic chemicals, which were introduced at level 6 or equivalent

Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Write reaction sequences for the synthesis of complex organic molecules
LO2	Outline strategies in organic synthesis and retrosynthesis
LO3	Evaluate proton nuclear magnetic resonance and it's role in molecular determination
LO4	Explain the reactions of selected heterocyclic compounds
Dependencies	
Module Recommendations	
Incompatible Modules	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
Students will have completed the level 6 modules, Organic Chemistry Fundamentals and Organic Chemistry or have completed equivalent level organic chemistry modules	

Indicative Content
Carbonyl Chemistry Carbanions; regioselectivity of enolisation reactions; thermodynamic versus kinetic enolates; reactions of active methylene compounds; 1,2 versus 1,4 addition to conjugated systems; aldol, Claisen and Dieckman condensations; the haloform and Michael addition; Robinson annulation
Stereochemistry Chirality; stereocentres, enantiomers, diastereomers, meso compounds; resolution of racemic mixtures
Amino acids, Peptides and Proteins Synthesis of proteins, protection and activation of functional groups and peptide bond formation; solid-phase peptide synthesis; primary, secondary, tertiary and quaternary structures of proteins
Nuclear Magnetic Resonance Spectroscopy Origins of proton NMR, absorbances, chemical shift, integration ratios, spin-spin coupling, diastereotopic and enantiotopic protons, structure determination
Heterocyclic Compounds Nomenclature of frequently-encountered heterocycles; reactions, regioselectivity of electrophilic and nucleophilic substitution reactions
Synthesis Design Strategies in organic synthesis and retrosynthesis, protecting groups.

Module Content & Assessment

Assessment Breakdown	%
Coursework	100.00%

Assessments

Coursework			
Assessment Type	Short Answer Questions	% of Total Mark	15
Timing	Week 3	Learning Outcomes	1,2
Assessment Description	Theory test		
Assessment Type	Short Answer Questions	% of Total Mark	15
Timing	Week 6	Learning Outcomes	1,2,3,4
Assessment Description	Theory test		
Assessment Type	Short Answer Questions	% of Total Mark	35
Timing	Week 10	Learning Outcomes	1,3
Assessment Description	n/a		
Assessment Type	Short Answer Questions	% of Total Mark	35
Timing	Sem End	Learning Outcomes	1,2,3,4
Assessment Description	n/a		
No End of Module Formal Examination			
Reassessment Requirement			
Repeat examination			
Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.			

Module Workload

Workload: Full Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Organic chemistry theory	Every Week	4.00	4
Independent & Directed Learning (Non-contact)	Non Contact	Personal study	Every Week	3.00	3
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					4.00

Workload: Part Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Organic Chemistry Theory	Every Week	4.00	4
Independent & Directed Learning (Non-contact)	Non Contact	Personal Study	Every Week	3.00	3
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					4.00

Module Resources

Recommended Book Resources
McMurray John E.. (2016), Organic Chemistry, 9th. Brooks Cole, [ISBN: 9781305080485].
Supplementary Book Resources
Sykes P.. (1986), A Guidebook to Mechanisms in Organic Chemistry, 6th. Prentice Hall, [ISBN: 13:9780130832191]. Michael B. Smith, Jerry March. (2007), March's advanced organic chemistry, 6th. Wiley, [ISBN: 978-0-471-72091-1]. Ege S.. (2004), Organic Chemistry, Structure and Reactivity, 5th. Houghton Mifflin, [ISBN: 0618318097]. Morrison R. T., Boyd R. N.. (2005), Organic Chemistry, 7th. Prentice Hall, [ISBN: 0132678160].
This module does not have any article/paper resources
This module does not have any other resources

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SCHQA_8	Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance	-1	Mandatory
CR_SCHEM_7	Bachelor of Science in Analytical and Pharmaceutical Chemistry	-1	Mandatory