

APPROVED

CHEA6001: Analytical Chemistry

Module Details

Module Code:	CHEA6001
Title:	Analytical Chemistry APPROVED
Long Title:	Analytical Chemistry
NFQ Level:	Fundamental
Valid From:	Semester 1 - 2019/20 (September 2019)
Duration:	1 Semester
Credits:	5
Field of Study:	4424 - Analytical Chemistry
Module Delivered in:	4 programme(s)
Module Description:	This is an introductory course in analytical chemistry which presents a foundation in spectroscopy and chromatography at both a practical and a theoretical level.

Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Explain the basic principles of spectroscopy and chromatography
LO2	Solve problems involving Beer-Lambert law calculations and other relevant calculations
LO3	Display competence in the laboratory in the use of molecular and atomic absorption spectroscopy, and gas chromatography including all preparatory work especially the preparation of solutions
LO4	Write practical reports associated to UV-Vis, atomic absorption and gas chromatography practicals in a clear and accurate manner and submit them in a timely fashion
LO5	Describe the manner of operation of equipment relevant to UV-Vis, atomic absorption and gas chromatography

Dependencies		
Module Recommendations		
13356	CHEA6001	Analytical Chemistry
Incompatible Modules		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements		
No requirements listed		

Indicative Content
Introduction to Analytical Chemistry Definitions, qualitative and quantitative analysis, measurement parameters. Types of analytical technique.
Quantitative Spectroscopy Introduction to optical methods. Beer-Lambert law Theory and calculations. Deviations from B/L Law and errors in application. Sample preparations, solvents, sample cells etc. Practical use of UV-Vis and atomic absorption instruments, calibrations, treatment of results and reporting.
Chromatography Introduction to chromatography. chromatographic principles. Gas chromatography: mobile phases, sample introduction, columns, types of stationary phases, types of detectors, temperature programming, quantitative techniques. Practical use of gas chromatography instrument, calibrations, treatment of results and reporting.
Ultraviolet-visible spectrophotometry Types and origins of spectra. UV-visible spectra of organic species, chromophores and auxochromes. UV-Visible spectra of inorganic species.

Module Content & Assessment

Assessment Breakdown	%
Coursework	40.00%
End of Module Formal Examination	60.00%

Assessments

Coursework			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	30
Timing	Every Week	Learning Outcomes	2,3,4,5
Assessment Description Performance of practicals with submission of reports and calculations			
Assessment Type	Short Answer Questions	% of Total Mark	10
Timing	Week 8	Learning Outcomes	1,2,5
Assessment Description Theory test. Topics may include: general analytical process, spectroscopy concepts, molecular absorption spectroscopy, Beer's law, chromatography concepts, gas chromatography,			
End of Module Formal Examination			
Assessment Type	Formal Exam	% of Total Mark	60
Timing	End-of-Semester	Learning Outcomes	1,2,5
Assessment Description End-of-Semester Final 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	Delivery of module content	Every Week	2.00	2
Lab	Contact	Practicals in UV-Vis, atomic absorption and gas chromatography	Every Week	2.00	2
Independent & Directed Learning (Non-contact)	Non Contact	Student undertakes independent 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	Delivery of module content	Every Week	2.00	2
Lab	Contact	Practicals in UV-Vis, atomic absorption and gas chromatography	Every Week	2.00	2
Independent & Directed Learning (Non-contact)	Non Contact	Student undertakes independent 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	
Douglas A. Skoog... [et al.]. (2013), Fundamentals of analytical chemistry, 9th. Chapters: 1,5,24,25,32, Cengage Learning, Inc, Belmont, CA, USA, [ISBN: 9780495558286].	
Supplementary Book Resources	
D.C Harris. (2016), Quantitative Chemical Analysis, 9th. Chapters 0, 18, 19, 20, Macmillan Learning, [ISBN: 9781464135385].	
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_SESST_8	Bachelor of Science (Honours) in Environmental Science and Sustainable Technology	-1	Mandatory
CR_SCHEM_7	Bachelor of Science in Analytical and Pharmaceutical Chemistry	-1	Mandatory
CR_SCHEM_6	Higher Certificate in Science in Chemistry	-1	Mandatory