

CHEA6002: Analytical Chemical Techniques

Module Details

Module Code:	CHEA6002
Title:	Analytical Chemical Techniques APPROVED
Long Title:	Analytical Chemical Techniques
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 module builds on the module Analytical Chemistry. The learner will meet a broader range of analytical techniques and develop greater independence and competence in the laboratory.

Learning Outcomes

On successful completion of this module the learner will be able to:

#	Learning Outcome Description
LO1	Show competence in laboratory analyses using a UV-Vis, IR, fluorescence, atomic emission spectroscopy instrumentation, and HPLC and gas chromatography instruments.
LO2	Describe the fundamentals and instrumentation relevant to IR, fluorescence and atomic absorption/emission spectroscopy and HPLC methods of analysis.
LO3	Identify and interpret major features of a spectrum and chromatogram.
LO4	Employ lab skills in solution preparation, calibration and treatment of results in delivering analytical protocols associated to spectroscopy and chromatography labs in a safe, competent and confident manner

Dependencies

Module Recommendations

13357	CHEA6002	Analytical Chemical Techniques
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Incompatible Modules

No incompatible modules listed

Co-requisite Modules

No Co-requisite modules listed

Requirements

No requirements listed

Indicative Content

Infrared Spectrophotometry

Theoretical background and practical use as a qualitative tool. Lab component: sampling techniques for solids, liquids, solutions, and interpretation of IR spectra, treatment of results and reporting.

Chromatography

Theoretical concepts of liquid chromatography, HPLC, solvent and sample preparation, pumps, columns, gradient elution, detectors, applications. Lab component: quantitative/qualitative use of HPLC and gas chromatography, calibrations, data treatment and reporting.

Atomic Spectroscopy

Theoretical background of atomic absorption and emission, flame atomisation, electrothermal and ICP atomisation, detection and interference. Lab component: quantitative use of atomic absorption and emissions spectrophotometry, calibrations, treatment of results and reporting.

Fluorimetry

Theoretical concepts related to radiative and non-radiative relaxation, structure and molecular emission, quantification, instrument components and operations. Lab component: quantitative use, calibration, data treatment and reporting.

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	1,3,4
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	2,3
Assessment Description Theory test including principles and instrumentation of IR, fluorescence and atomic spectroscopies.			
End of Module Formal Examination			
Assessment Type	Formal Exam	% of Total Mark	60
Timing	End-of-Semester	Learning Outcomes	2,3
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	Module Content delivery	Every Week	2.00	2
Lab	Contact	Practical skills development	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	Module Content delivery	Every Week	2.00	2
Lab	Contact	Practical skills development	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: 27,28,33, Cengage Learning, Inc, Belmont, CA, USA, [ISBN: 9780495558286].

Supplementary Book Resources

D. C. Haris. (2016), Quantitative Chemical Analysis, 9th. Chapters: 21, 25,, 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