ZSCI C3101: Sampling and Separation Science 2

Module Title:	Sampling and Separation Science 2
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	2 programme(s)

Teaching & Learning Strategies:	This module content previously outlined will be taught in a one hour theory class and one three hour practical session per week. The emphasis will be on the development of good laboratory techniques and experience in the art of chemical separations. Particular emphasis will be placed on the theory and applications of chromatography and other more traditional methods of chemical separation. To encourage an interest in the subject area students may be brought on industrial visits (where possible and appropriate) to illustrate the importance and industrial applications of the module content.

Module Aim:	The aim of this module is to impart knowledge of the fundamental principles of separation methods used in chromatographic analysis and to provide practical training in this subject area with due regard to best practice and safety.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Discuss the principles and background chemistry involved in routinely used in chromatographic separation methods.
LO2	Discuss appropriate applications of the techniques studied.
LO3	Perform the designated laboratory exercises with due regard to safety and best practice.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
Successful completion of year 2 or equivalent

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Module Content & Assessment

Indicative Content
Section 1.1 Gas Chromatography: Basic principles, detectors, columns, stationary phases, temperature programming, internal standards and quantitation, derivatisation, GC-MS. .
Section 1.2 Ion exchange chromatography. Resin choice, pH effects, ionic strength of eluents. Ion chromatography, chemical suppression, environmental analysis.
Section 1.3 High Pressure/Performance liquid chromatography. Basic principles, columns, stationary phases, detectors, sample preparation, sample clean-up, solid phase extraction, ion pairing reagents, gradient and isocratic elution, relative response factors, quantitative and qualitative analysis.
Section 1.3 Electrophoresis: Basic principles, high and low voltage electrophoresis, paper, gel and capillary electrophoresis.
Practical The scheduled practicals will develop the following skills: GC and HPLC separations (quantitative and qualitative), ion exchange chromatography, ion chromatography, electrophoresis.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	40.00%
End of Module Formal Examination	50.00%

Special Regulation
Students must achieve a minimum grade (35%) in both the practical/CA and final examination.

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	1 hour exam	1,2	10.00	n/a

No Project

Practical				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical Laboratory book	3	40.00	Sem 1 End

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	2 hour exam	1,2,3	50.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	1.00
Laboratory	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	5.13
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SAPHA_B	Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation	6	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	6	Mandatory