ZSCI C3100: Sampling and Separation Science 1

Module Title:	Sampling and Separation Science 1
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 importance of good sampling procedures and of the fundamental principles of separation methods used in chemical 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	Describe and discuss the importance of rigorous sampling procedures
LO2	Discuss the principles and background chemistry involved in routinely used separation methods
LO3	Discuss appropriate applications of the techniques studied.
LO4	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.*
No requirements listed

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Module Content & Assessment

Indicative Content
Section 1.1 Sampling (representative) of solids, liquids and gases
Section 2.2 Solvent extraction. Principles, KD, D, pH, ion association, chelation, continuous and multiple extractions, Ka, clean-up and concentration techniques, calculations.
Section 1.3 Distillation: Fractional, reduced pressure and azeotropic distillation. Raoult's Law and deviations.
Section 1.4 Chromatography: Basic principles, adsorption, partition. Stationary and mobile phases. Separation on molecular level. Band broadening. Thin layer and Paper chromatography. Stationary and mobile phases, detectors.
Section 1.5 Steam Distillation: Principles and applications
Practical The scheduled practicals will develop the following skills: solvent extraction, distillation, chromatographic analysis.

Assessment Breakdown	%
Continuous Assessment	60.00%
Practical	40.00%

Special Regulation
Students must achieve a minimum grade (35%) in both the CA and Practical

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Three 1 hour exams	1,2,3	60.00	n/a

No Project

Practical				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical Laboratory book	4	40.00	Sem 1 End

No End of Module Formal Examination

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
Practicals	12 Weeks per Stage	3.00
Estimated Learner Hours	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	5	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	5	Mandatory