ZPHA C2102: Pharmaceutical Science

Module Title:	Pharmaceutical Science
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	3 programme(s)

Teaching & Learning Strategies:	This module will be taught in two theory classes of 1 hour duration plus one 3 hour practical per week for 12 weeks. To consolidate lectures and practicals, students will normally be required to carry out assignments and prepare a weekly practical report analysing their own research and results. Any course-related issue or questions that may arise will be discussed at lectures.

Module Aim:	To analyse and assay pharmaceutical formulations using different analytical techniques

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	To carry out chromatographic separations of drugs, pharmaceutical assays, and to operate analytical techniques used in the analysis of pharmaceuticals.
LO2	To identify certain categories of drugs.
LO3	Comprehend and apply quality control measures in pharmaceutical analysis.

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 1 or equivalent

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Module Content & Assessment

Indicative Content
Pharmaceutical industry Introduction to pharmaceutical industry. Primary and secondary manufacture. Basic calculations in pharmaceutical analysis. Licensing of drugs and the pharmacopoeia. European Pharmacoipoeia, BP and USP monographs of pure drugs and formulations including assays, storage and identification.
Pharmaceutical chemistry Selected categories of pharmaceuticals: vitamins, analgesics, general and local anaesthetics, sulphonamides antibiotics, antacids and acid-inhibitors, barbiturates.
Control of the quality of analytical method Control of errors in analysis. Repeatability and reproducibility. Validation of drug analysis to include assay, precision specificity, LOD, LOQ, linearity, ruggedness and robustness.
Chemistry of acids and bases Ionisation of drugs. pKa values of drugs. Partition coefficients relating to drug absorption.
Analytical techniques Analytical methods used in drug analysis – UV/Vis, AAS, AES, Titrimetric,IR, GC and HPLC methods. E(1%,1cm). Dissolution testing
Extraction methods in pharmaceutical analysis Excipients in formulations. Solvent and solid phase extraction methods.
Chromatographic Techniques Principles of adsorption, partition, ion exchange, molecular and affinity chromatography. Chromatogram description. Theoretical plates. Resolution, selectivity. Gas-liquid chromatography. High performance liquid chromatography. Methods of separation. Mobile and stationary phases. Columns, detectors, solvents. Use in the analysis of drugs. Sample preparation. Qualitative and quantitative measurements. Internal standards.
Practical Practicals will develop skills in the use of analytical equipment and techniques from AAS, AES, FTIR, HPLC, GC, UV-Vis in the analysis of selected pharmaceutical products. Specific assays from the BP or the EP will also be carried out.

Assessment Breakdown	%
Continuous Assessment	60.00%
Practical	40.00%

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

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Exam	1,2,3	30.00	n/a
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No Project

Practical				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Lab Worksheets and Reports; Practical Log Book	1	40.00	n/a

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	2.00
Laboratory	12 Weeks per Stage	3.00
Estimated Learner Hours	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SAPHA_B	Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation	4	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	4	Mandatory
CW_SASCI_C	Higher Certificate in Science in Applied Biology or Applied Chemistry	4	Group Elective 2