

MODULE DESCRIPTOR

Module Title

Instrumental Analytical Sciences

Reference	PLM303	Version	1
Created	February 2023	SCQF Level	SCQF 11
Approved	March 2023	SCQF Points	30
Amended	August 2021	ECTS Points	15

Aims of Module

To effectively problem-solve and critically evaluate analytical techniques such as Chromatography, Electroanalysis, Microscopy, Molecular Spectroscopy, and Mass Spectrometry.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Critically evaluate a range of advanced analytical instrumentation.
- 2 Critically discuss conventional techniques for the solution of a given analytical problem.

Indicative Module Content

The principles, applications and limitations of:- Spectroscopy - atomic spectroscopy (emission and absorption), x-ray fluorescence; molecular spectroscopy - UV/Vis, FTIR, fluorescence, raman, mass spectrometry, phosphorescence, lifetime TRF, derivative spectroscopy, NIR, FIR, NMR; Chromatography - GC, HPLC, UPLC, CZE and higher modes, HILIC, SCFC, green chromatography, GC-GC, affinity chromatography, LC-MS, GC-MS, LC-MS/MS. Microscopy - TEM, SEM/EDXA Electroanalysis - ISE's, potentiometry, voltammetry, biosensors.

Module Delivery

The module is delivered through a series of lectures and tutorials. Some guest lectures. The separate laboratory programme also affords students the opportunity to develop and extend the material in a practical context.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	48	48
Non-Contact Hours	252	252
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	300
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type: Examination Weighting: 100% Outcomes Assessed: 1, 2
 Description: Component 1 is a closed book examination.

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The grade represents Component 1 (EX1). A minimum module grade of D is required for a pass. Non-submission of either component will result in an NS grade.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A
B	B
C	C
D	D
E	E
F	F
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module: None in addition to the course entry requirements.
 Corequisites for module: None.
 Precluded Modules: None.

INDICATIVE BIBLIOGRAPHY

- 1 SKOOG, D.A., HOLLER, F.J. and CROUCH, S.A. 2017. Principles of Instrumental Analysis. Seventh Edition. Belmont, CA: Thomson Higher Education.
- 2 POOLE, C.F. 2021. Gas Chromatography. Second Edition. Electronic resource.
- 3 LAJUNEN, L.H.J. and PERAMAKI, P. 2004. Spectrochemical Analysis by Atomic Absorption and Emission. Second Edition. Cambridge, UK: The Royal Society of Chemistry.
- 4 SCHMIDT, W. 2005. Optical Spectroscopy in Chemistry and Life Sciences. An Introduction. Weinheim, Germany: Wiley-VCH.
- 5 BRETT, C.M.A. AND BRETT, A.M.O. 1998. Electroanalysis, Oxford Chemistry Primers. Oxford University Press.
- 6 LANGMAN, L.J. 2012. LC-MS in Drug Analysis: Methods and Protocols. Electronic Resource.
- 7 LEVINSON, R. 2001. More Modern Chemical Techniques. London, UK: The Royal Society of Chemistry.