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Title: ADVANCED INSTRUMENTAL ANALYSIS  
 Status: Definitive  
 Code: **6002CHACAP** (113179)  
 Version Start Date: 01-08-2019

Owning School/Faculty: Pharmacy & Biomolecular Sciences  
 Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
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**Academic Level:** FHEQ6      **Credit Value:** 24      **Total Delivered Hours:** 50

**Total Learning Hours:** 240      **Private Study:** 190

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	28
Practical	16
Workshop	4

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	60	2
Practice	AS2	Practicals	40	

### Aims

*To develop knowledge and practical experience of advanced techniques for chemical, forensic and pharmaceutical analysis. Opportunities for the analysis of drugs of abuse, pharmaceuticals and environmental samples will be provided.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Make reasoned judgements regarding the quality of analytical data obtained from practical experience and, given appropriate information, determine whether an analytical method is fit for purpose.
- 2 Demonstrate an understanding of the principles and practice of atomic spectroscopy and its application to the analysis of drugs and other samples.
- 3 Demonstrate an understanding of the applications and uses of mass spectrometry with respect to chromatographic and plasma introduction.
- 4 Select an appropriate analytical technique for a particular analyte/matrix separation.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4
PRACTICALS	1	2	3	4

## Outline Syllabus

*1) Analytical quality control: Fitness for purpose and sample preparation techniques commonly used in bioanalysis will be covered.*

*2) Coupled Chromatographic Techniques: Instrumentation, applications and function of GC-MS, LC-MS and tandem mass spectrometry (LC-MS/MS) for the use of unknown and target screening. Atmospheric HPLC-MS interfacing techniques including electrospray (ESI) will be explained. The use of multiple quadrupole instruments and their uses in improvement in chromatography data will be discussed.*

*3) Atomic Spectroscopy: Applications of ICP and ICP-MS techniques to the determination of toxic metals in drugs and related samples. Where do they come from, why are they regulated, and what risk do they pose? Sample Preparation including the use of microwaves for increased throughput. Instrumentation and potential interferences problems of the techniques will be discussed. The application of ICP-MS to high sensitivity trace element determination will be considered with relation to real samples such as water, soil and clinical samples.*

## Learning Activities

Lectures, workshops and practical sessions.

## Notes

The module is designed to provide students with the concepts and practical experience relevant for the working world within the context of chemical, pharmaceutical and forensic analysis.