

Module Title:	Analytical Techniques 1
Academic year:	2009 2010
Credit Value:	7
Pre- requisites:	Scientific Analysis 1 and 2
Assessment:	Exams (50%), Laboratory reports Practical exam (35%) Continuous assessment (15%).
Aims	<p>This module aims to provide the student with;</p> <ul style="list-style-type: none"> ▪ Knowledge of the principles of separations systems such as HPLC, GC and Capillary Electrophoresis and their hyphenated techniques. ▪ An appreciation of the importance of sample preparation prior to analysis and selection of appropriate extraction method. ▪ An understanding of the theory and instrumental operation of spectroscopic methods such as mass spectrometry and UV/Visible spectroscopy and the ability to perform structural identification and purity testing of simple organics using mass spectrometry. ▪ Practical skills in specific analytical techniques and the ability to select, set up, trouble-shoot and perform quantitative analysis of mixtures with subsequent method validation. ▪ The ability to critically analyse data and interpret results.

<p>Module Content</p>	<p>HPLC:instrumentation review; modes of HPLC (reverse phase/chiral separations); method development & applications; standard addition, internal standards, validation, preparative HPLC; practical problems/troubleshooting & maintenance; Gas chromatography: chromatography principles; instrumentation; capillary & packed columns; detectors; method development; quantitative techniques; internal and external calibration; response factors; validation troubleshooting; case studies.</p> <p>Capillary Electrophoresis: Instrumentation, principles, theory, EOF, efficiency and resolution, temperature and voltage effects, detectors, modes of CE, applications and case studies</p> <p>Mass spectrometry: principles of Mass spectrometry; instrument overview; ionisation methods;</p> <p>GC & HPLC-MS: GC-MS and HPLC-MS Overview; interfaces; applications, case studies.</p> <p>Sample Preparation extraction (liquid-liquid and solid phase), efficiency and selectivity of extraction, supercritical fluid, membrane technology; applications.</p> <p>Practical Course</p> <p>A practical course will be designed and developed to support and reflect the aims and learning outcomes of this module</p>
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<p>Intended Learning Outcomes: (September 2007)</p>	<p>The student will be able to:</p> <p>Demonstrate specialised knowledge and technical related to chromatographic, electrophoretic spectroscopic systems.</p> <p>Apply the knowledge of specific spectroscopic techniques (Mass spectrometry) to achieve structural elucidation of simple organic molecules.</p> <p>Apply the principles of analytical techniques to quantitative determination of organics, bioorganic and inorganic solutes.</p> <p>Show an ability to interpret data from laboratory measurements and effectively report findings.</p> <p>Demonstrate competence in planning and execution of practical investigations from problem recognition through to appraisal of results and findings</p> <p>Justify the correct selection of analytical techniques for a particular scientific problem.</p> <p>Implement group work and team building skills execution of laboratory work.</p> <p>Demonstrate a capacity to integrate concepts across a range of analytical methodology.</p>
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