CBMS708
Chemical Analysis II
S1 Day 2015
Dept of Chemistry & Biomolecular Sciences

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The chemical principles and practice of identifying and determining the composition are discussed. Topics covered include many analytical techniques commonly employed in both industrial and academic research laboratories. The unit emphasises hands-on experience in analysing real-life samples. A proportion of the unit develops skills in the use of modern library resources and electronic information retrieval. Using these skills, students will complete a short research project addressing a real-life analytical chemistry problem.
On successful completion you will be able to:

- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
- To be able to make a selection of an appropriate analytical technique or a combination of techniques for the analysis of targeted samples, based on the chemistry involved
- To interpret and draw sound conclusions from analytical chemical data obtained
- To prepare written scientific documents at a satisfactory level
- To deliver with confidence an oral presentation on a selected topic in analytical chemistry
Of the 40% for this component, 65% of the assessment will be weighted for laboratory work, and 35% weighted for a project. Each student is required to submit a report and also to deliver a verbal presentation for the project.

On successful completion you will be able to:
- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
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- To deliver with confidence an oral presentation on a selected topic in analytical chemistry

Mid-Year 3-hour Examination
Due: June 2015
Weighting: 50%
Closed book examination.

On successful completion you will be able to:
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- To interpret and draw sound conclusions from analytical chemical data obtained

Delivery and Resources

Prescribed text

Recommended references
## Unit Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td><strong>February 23</strong></td>
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<tr>
<td></td>
<td>9:00 – 10:30</td>
<td>Outline of Unit</td>
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<tr>
<td></td>
<td></td>
<td>Calibration Methods</td>
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<tr>
<td></td>
<td>11:00 – 1:00</td>
<td>Voltammetry</td>
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<tr>
<td></td>
<td>2:00 – 4:00</td>
<td>Information Retrieval</td>
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<td></td>
<td>4:00 – 6:00</td>
<td>Scientific Report Writing</td>
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<td><strong>March 2</strong></td>
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<tr>
<td></td>
<td>9:00 – 1:00</td>
<td>Laboratory Session</td>
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<tr>
<td></td>
<td>2:00 – 3:30</td>
<td>Voltammetry</td>
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<tr>
<td></td>
<td>4:00 – 5:30</td>
<td>Voltammetry</td>
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<tr>
<td></td>
<td></td>
<td>Tutorial Set 1 on Voltammetry</td>
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<tr>
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<td></td>
<td>Assignment 1 due at 6 pm, April 2, 2015</td>
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<tr>
<td><strong>March 9</strong></td>
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<tr>
<td></td>
<td>9:00 – 1:00</td>
<td>Laboratory Session</td>
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<td></td>
<td>2:00 – 3:30</td>
<td>Voltammetry</td>
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<td></td>
<td>4:00 – 5:30</td>
<td>Voltammetry</td>
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<td><strong>March 16</strong></td>
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<td>9:00 – 1:00</td>
<td>Laboratory Session</td>
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<td></td>
<td>2:00 – 3:30</td>
<td>Atomic Absorption Spectroscopy</td>
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<td>4:00 – 5:30</td>
<td>Atomic Absorption Spectroscopy</td>
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<tr>
<td></td>
<td></td>
<td>Tutorial Set 2 on Atomic Absorption Spectroscopy</td>
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<td>Date</td>
<td>Time</td>
<td>Activity</td>
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<tr>
<td>March 23</td>
<td>9:00 – 1:00</td>
<td>Laboratory Session</td>
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<tr>
<td></td>
<td>2:00 – 3:30</td>
<td>Electrophoresis</td>
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<td>4:00 – 5:30</td>
<td>Electrophoresis</td>
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<td>Tutorial Set 3 on Electrophoresis</td>
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<td>March 30</td>
<td>9:00 – 1:00</td>
<td>Laboratory Session</td>
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<tr>
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<td>2:00 – 3:30</td>
<td>Mass Spectroscopy</td>
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<td></td>
<td>4:00 – 5:30</td>
<td>Mass Spectroscopy</td>
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<td></td>
<td></td>
<td>Assignment 2 due at 6 pm, April 24, 2015</td>
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<td>April 20</td>
<td>9:00 – 1:00</td>
<td>Laboratory Session</td>
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<td>2:00 – 3:30</td>
<td>Mass Spectroscopy</td>
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<td></td>
<td>4:00 – 5:30</td>
<td>Chromatography</td>
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<td></td>
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<td>Tutorial Set 4 on Mass Spectroscopy</td>
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<td>April 27</td>
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<td>Laboratory Session</td>
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<td></td>
<td>2:00 – 3:30</td>
<td>Chromatography</td>
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<td></td>
<td>4:00 – 5:30</td>
<td>Chromatography</td>
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<tr>
<td></td>
<td></td>
<td>Tutorial Set 4 on Chromatography</td>
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<td>Assignment 3 due at 6 pm, May 22, 2015</td>
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<td>June 1</td>
<td>9:00 – 10:30</td>
<td>Immunoassays</td>
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Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:


In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

Results

Results shown in iLearn, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

Student Support

Macquarie University provides a range of support services for students. For details, visit [http://students.mq.edu.au/support/](http://students.mq.edu.au/support/)

Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
Student Services and Support
Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries
For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help
For help with University computer systems and technology, visit http://informatics.mq.edu.au/help.

When using the University's IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities
PG - Capable of Professional and Personal Judgment and Initiative
Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
- To be able to make a selection of an appropriate analytical technique or a combination of techniques for the analysis of targeted samples, based on the chemistry involved
- To interpret and draw sound conclusions from analytical chemical data obtained
- To prepare written scientific documents at a satisfactory level
- To deliver with confidence an oral presentation on a selected topic in analytical chemistry

Assessment tasks

- Assignments
- Laboratory Work
- Mid-Year 3-hour Examination
PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

**Learning outcomes**

- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
- To be able to make a selection of an appropriate analytical technique or a combination of techniques for the analysis of targeted samples, based on the chemistry involved
- To interpret and draw sound conclusions from analytical chemical data obtained
- To prepare written scientific documents at a satisfactory level
- To deliver with confidence an oral presentation on a selected topic in analytical chemistry

**Assessment tasks**

- Assignments
- Laboratory Work
- Mid-Year 3-hour Examination

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

**Learning outcomes**

- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
- To be able to make a selection of an appropriate analytical technique or a combination of techniques for the analysis of targeted samples, based on the chemistry involved
- To interpret and draw sound conclusions from analytical chemical data obtained
- To prepare written scientific documents at a satisfactory level
- To deliver with confidence an oral presentation on a selected topic in analytical chemistry
Assessment tasks

- Assignments
- Laboratory Work
- Mid-Year 3-hour Examination

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
- To be able to make a selection of an appropriate analytical technique or a combination of techniques for the analysis of targeted samples, based on the chemistry involved
- To interpret and draw sound conclusions from analytical chemical data obtained
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Assessment tasks

- Assignments
- Laboratory Work
- Mid-Year 3-hour Examination

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- To acquire the principles of a range of advanced analytical techniques commonly used in industrial and academic research
- To be able to make a selection of an appropriate analytical technique or a combination of techniques for the analysis of targeted samples, based on the chemistry involved
• To interpret and draw sound conclusions from analytical chemical data obtained
• To prepare written scientific documents at a satisfactory level
• To deliver with confidence an oral presentation on a selected topic in analytical chemistry

Assessment tasks
• Assignments
• Laboratory Work
• Mid-Year 3-hour Examination

PG - Engaged and Responsible, Active and Ethical Citizens
Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes
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• To interpret and draw sound conclusions from analytical chemical data obtained
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Assessment tasks
• Assignments
• Laboratory Work
• Mid-Year 3-hour Examination

Changes since last offering
There are no changes made in CBMS825 since the last offering.

Technology Used
It is important that you have a scientific calculator as hand-held calculators will be used during laboratory sessions, for assignments,

and in the final examination. Note that text retrieval calculators are not allowed in the final examination.
Use will be made of Excel and other data processing and display software. Computers carrying this software are available in the teaching laboratories. Items of interest, links to other on-line material will be placed on the unit website.

Computers for general use are provided by the University, but it would be advantageous to have your own computer and internet access.