# CBMS708

## Chemical Analysis II

S1 Day 2014

*Chemistry and Biomolecular Sciences*

## Contents

# General Information

Unit convenor and teaching staff
Lecturer
Christopher McRae
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F7B 328
Students are encouraged to arrange a meeting via email.

Unit Convenor
Danny Wong
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F7B 235

Credit points
4

Prerequisites
Admission to MRes

Corequisites

Co-badged status
CBMS708 is co-badged with CBMS308 and CBMS825.

Unit description
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.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

# Learning Outcomes

On successful completion of this unit, you will be able to:

Acquire the basic principles of a range of 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.
Interpret and draw sound conclusions from analytical chemical data obtained.
Prepare written scientific documents at a satisfactory level.
Deliver with confidence an oral presentation on a selected topic in analytical chemistry.

# Assessment Tasks

| Name | Weighting | Due |
|---|---|---|
| Assignments | 10% | March 25; April 14; May 12 |
| Laboratory Work | 40% | Week4,5,6,7,8,9,10,11,12,13 |
| Mid-Year 3-hour Examination | 50% | June 2104 |

## Assignments

Due: **March 25; April 14; May 12**
Weighting: **10%**

On successful completion you will be able to:

- Acquire the basic principles of a range of 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.
- Interpret and draw sound conclusions from analytical chemical data obtained.
- Prepare written scientific documents at a satisfactory level.

## Laboratory Work

Due: **Week4,5,6,7,8,9,10,11,12,13**
Weighting: **40%**

This component consists of 5 laboratory experiments and 1 project.

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:

- Acquire the basic principles of a range of 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.
- Interpret and draw sound conclusions from analytical chemical data obtained.
- Prepare written scientific documents at a satisfactory level.
- Deliver with confidence an oral presentation on a selected topic in analytical chemistry.

## Mid-Year 3-hour Examination

Due: **June 2104**
Weighting: **50%**

On successful completion you will be able to:

- Acquire the basic principles of a range of 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.
- Interpret and draw sound conclusions from analytical chemical data obtained.

# Delivery and Resources

Prescribed text:

D.A.Skoog, D.M.West, F.J.Holler, S.R.Crouch, Fundamentals of Analytical Chemistry, 9th Edition, Brooks/Cole, Thomson Learning, Inc (2014).

Recommended references (all available in University Library)

D.C.Harris, Quantitative Chemical Analysis, 6th Edition, W.H.Freeman and Company (2003).

H.H.Willard, L.L.Merritt, Jr., J.A.Dean, F.A.Settle, Jr., Instrumental Methods of Analysis, 7th Edition, Wadworth Publishing Company (1988).

D.A.Skoog, F.J.Holler and T.A.Nieman, Principles of Instrumental Analysis, 5th Edition, Saunders College Publishing (1998).

Student Support Services

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at http://www.students.mq.edu.au.

# Unit Schedule

DateTimeActivity

March 39:00 – 10:30Outline of Unit

Calibration Methods

11:00 – 1:00Voltammetry

2:00 – 4:00Information Retrieval

March 109:00 – 1:00Laboratory Session

2:00 – 3:30Voltammetry

4:00 – 5:30Voltammetry

TUTORIAL SET 1 ON VOLTAMMETRY

ASSIGNMENT 1 DUE AT 6 PM, MARCH 25, 2014

March 179:00 – 1:00Laboratory Session

2:00 – 3:30Voltammetry

4:00 – 5:30Voltammetry

March 249:00 – 1:00Laboratory Session

2:00 – 3:30Atomic Absorption Spectroscopy

4:00 – 5:30Atomic Absorption Spectroscopy

TUTORIAL SET 2 ON ATOMIC ABSORPTION SPECTROSCOPY

March 259:00 – 1:00Laboratory Session

2:00 – 3:30Electrophoresis

4:00 – 5:30Electrophoresis

TUTORIAL SET 3 ON ELECTROPHORESIS

March 319:00 – 1:00Laboratory Session

2:00 – 3:30Mass Spectroscopy

4:00 – 5:30Mass Spectroscopy

ASSIGNMENT 2 DUE AT 6 PM, APRIL 14, 2014

April 79:00 – 1:00Laboratory Session

2:00 – 3:30Mass Spectroscopy

4:00 – 5:30Chromatography

Tutorial Set 4 on Mass Spectroscopy

April 289:00 – 1:00Laboratory Session

2:00 – 3:30Chromatography

4:00 – 5:30Chromatography

TUTORIAL SET 4 ON CHROMATOGRAPHY

Assignment 3 due at 6 pm, May 12, 2014

June 29:00 – 10:30Immunoassays

11:00 – 12:30Immunoassays

TUTORIAL SET 5 ON IMMUNOASSAYS

1:30 – 5:30Presentation of project work (CBMS825)

Classes Timetable: Please check http://www.timetables.mq.edu.au/ for the official timetable of the unit. Lectures: The material presented in the lectures is important and you should not assume that all examinable material is available in the textbook or in printed notes. On the other hand, do not assume that all examinable material is to be found in the lecture notes. Tutorial: There are no tutorial sessions in this unit. Laboratory Work: Laboratory sessions commence in Week 2. You will undertake five experiments in E7B 354, the 2nd / 3rdYear teaching Laboratories. A laboratory roster will be issued in Week 1 to indicate which experiments you will be undertaking.

# 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:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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/

## Student Support

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

### Learning Skills

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

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

## 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.

# Changes since last offering

There is no change in the 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 unitwebsite.

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