CHEM3202

Advanced Analysis and Measurement

Session 1, Weekday attendance, North Ryde 2021

Archive (Pre-2022) - Department of Molecular Sciences

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Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to timetable viewer. To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff
Convener, Lecturer
Alf Garcia-Bennett
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4 Wally's Walk, Level 3, Room 327
Tuesday and Thursday 15:00-17:00

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Credit points
10

Prerequisites
CHEM2201 or CBMS200 or CBMS208

Corequisites

Co-badged status
CHEM 3202

Unit description
This unit covers advanced aspects of chemical analysis, building on the foundations laid in Analysis and Measurement. Modern chemical principles and practice of identifying substances and of determining their composition are discussed. Topics include many analytical techniques commonly employed in both industrial and academic research laboratories. The unit emphasises hands-on experience in analysing real life samples, using a wide range of techniques from a chemical, structural and physical perspective.

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:

ULO1: Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.

ULO2: Demonstrate competency in the selection and use of important analytical techniques commonly used in industrial and academic research.

ULO3: Communicate effectively within the conventions of the analytical molecular sciences discipline.

ULO4: Process and analyse chemical experimental data to draw scientifically sound conclusions, particularly the significance and validity of analytical results involving real-life samples.

ULO5: Communicate analytical chemical knowledge by appropriately documenting the essential details of procedures undertaken, key observations, results and conclusions.

General Assessment Information

In order to complete this unit satisfactorily students must:

(a) attend and participate satisfactorily in **ALL** laboratory sessions;

(b) submit satisfactory efforts at two (2) assignments;

(c) perform satisfactorily in a final examination of three hours duration.

Assessment Tasks

Name	Weighting	Hurdle	Due
Laboratory	30%	No	1 week after completion of Laboratory Session

Name	Weighting	Hurdle	Due
Assignment 1	10%	No	Monday 18th April, Week 17
Assignment 2	10%	No	Friday 18th May, Week 22
Final Examination	50%	No	Week 14-15

Laboratory

Assessment Type [1]: Lab report
Indicative Time on Task [2]: 30 hours
Due: **1 week after completion of Laboratory Session**
Weighting: **30%**

For each experiment, students are required to complete some Pre-laboratory work including Materials Safety Data Sheets and the general understanding of aim and procedure of the experiment. Following the completion of a laboratory session, students will then complete a written report.

On successful completion you will be able to:

- Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.
- Demonstrate competency in the selection and use of important analytical techniques commonly used in industrial and academic research.
- Communicate effectively within the conventions of the analytical molecular sciences discipline.
- Process and analyse chemical experimental data to draw scientifically sound conclusions, particularly the significance and validity of analytical results involving real-life samples.
- Communicate analytical chemical knowledge by appropriately documenting the essential details of procedures undertaken, key observations, results and conclusions.

Assignment 1

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 15 hours
Due: **Monday 18th April, Week 17**
Weighting: **10%**

Qualitative and quantitative questions requiring processing and critically analysis.

On successful completion you will be able to:

- Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.
- Communicate effectively within the conventions of the analytical molecular sciences discipline.
- Process and analyse chemical experimental data to draw scientifically sound conclusions, particularly the significance and validity of analytical results involving real-life samples.

Assignment 2

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 15 hours
Due: **Friday 18th May, Week 22**
Weighting: **10%**

Qualitative and quantitative questions requiring processing and critically analysis.

On successful completion you will be able to:

- Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.
- Communicate effectively within the conventions of the analytical molecular sciences discipline.
- Process and analyse chemical experimental data to draw scientifically sound conclusions, particularly the significance and validity of analytical results involving real-life samples.
- Communicate analytical chemical knowledge by appropriately documenting the essential details of procedures undertaken, key observations, results and conclusions.

Final Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 35 hours
Due: **Week 14-15**
Weighting: **50%**

Closed book examination.

On successful completion you will be able to:

- Demonstrate an understanding of the concepts of molecular analysis and measurement in the molecular sciences.
- Communicate effectively within the conventions of the analytical molecular sciences discipline.
- Process and analyse chemical experimental data to draw scientifically sound conclusions, particularly the significance and validity of analytical results involving real-life samples.
- Communicate analytical chemical knowledge by appropriately documenting the essential details of procedures undertaken, key observations, results and conclusions.

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Lecture notes, laboratory notes, tutorial videos and assignments can all be downloaded from iLearn.

Prescribed text: D.C.Harris, Quantitative Chemical Analysis, 9th Edition, W.H.Freeman and Company (2016).

Recommended references (all available in University Library):

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

D.S.Hage, J.D.Carr, Analytical Chemistry and Quantitative Analysis, International Edition, Prentice Hall (2011).

D.A.Skoog, F.J.Holler and S.R.Crouch, Principles of Instrumental Analysis, 6th Edition, Saunders College Publishing (2007).

D. Sheehan, Physical Biochemistry: Principles and Applications, 2nd Edition, John Wiley & Sons

Ltd (2009)

Unit Schedule

Week	Topic	Lecturer
1	Introduction to Analytical Chemistry and Measurement	AGB, YW
2	Statistical Methods in Analytical Chemistry	YW
3	Calibration and Metrology, Regulations and Standards.	AGB
4	Advanced Spectroscopy	AR
5	Mass Spectroscopy	AGB
6	Atomic Adsorption	IJ
7	Electrochemistry 1	AEGB
8	Electrochemistry 2	AEGB
9	Scattering 1	AEGB
10	Scattering 2	AEGB
11	Analytical Microscopy	AEGB
12	Gravimetric Analysis and Chemometrics	AEGB
13	Revision Lectures	AEGB

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.e

du.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@mq.edu.au

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 help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

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

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

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