FOSE1005

Mathematical Concepts for Science

Session 1, Weekday attendance, North Ryde 2020

Science and Engineering Faculty level units

Contents

General Information

Unit convenor and teaching staff
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Credit points
10

Prerequisites

Corequisites

Co-badged status

Unit description
An introduction to the basic quantitative methods and techniques common to much of science. You will learn how to formulate scientific problems using mathematical language, use a range of techniques to analyse and solve these problems, and gain an understanding of how to interpret the solutions. Amongst other topics, this unit will cover rates of change, graphical display and interpretation of mathematical concepts, logarithmic and exponential scales, all in the context of scientific measurement and analysis. In the process, this unit introduces vital skills for tertiary learning and explores their relationship to your success in future careers.

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: Analyze problems in multiple science disciplines, at foundation level, using mathematical concepts and techniques.

ULO2: Communicate mathematical concepts in a variety of ways using formal and informal presentations including the use of graphical methods and appropriate software.

ULO3: Identify the mathematical principles underlying basic discipline-specific problems.

ULO4: Create and interpret the content of mathematical models relevant to foundation level science topics.

ULO5: Demonstrate foundational employability and self-directed learning skills, including recording academic achievements to link university study to future careers.

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult iLearn for revised unit information.

Find out more about the Coronavirus (COVID-19) and potential impacts on staff and students

General Assessment Information

Hurdle summary

1. Lecture attendance. Monitored through responses to questions posed during lectures. Responses must be received by 9am following the day of the lecture. There are 10 weeks of lectures. Participation in 8 lectures is compulsory.

2. SGTA participation. There are 11 SGTAs, from week 1 to week 11. Participation in 9 SGTAs is compulsory.

3. Test performance. Each of the 3 tests is a hurdle. A score of 40% or more on each test is required to pass the hurdle. A score between 30% and 40% entitles you to a resit of the test. If a resit is allowed, the required mark is still 40%, and the mark allocated to the assessment is capped at this mark. (So if a mark of 70% is achieved on the resit, a mark of 40% is awarded.)

ATTENDANCE and PARTICIPATION: Please contact the unit convenor as soon as possible if you have difficulty attending and participating in any classes. There may be alternatives available

to make up the work. If there are circumstances that mean you will miss a class, you can apply for Special Consideration via ask.mq.edu.au

ASSIGNMENT SUBMISSION: Assignment submission will be online through the iLearn page.

Submit assignments online via the appropriate assignment link on the iLearn page. A personalised cover sheet is not required with online submissions. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration.

- Assignment submission is via iLearn. You should upload this as a single scanned PDF file.

- Please note the quick guide on how to upload your assignments provided on the iLearn page.

- Please make sure that each page in your uploaded assignment corresponds to only one A4 page (do not upload an A3 page worth of content as an A4 page in landscape). If you are using an app like Clear Scanner, please make sure that the photos you are using are clear and shadow-free.

- It is your responsibility to make sure your assignment submission is legible.

- If there are technical obstructions to your submitting online, please email us to let us know.

You may submit as often as required prior to the due date/time. Please note that each submission will completely replace any previous submissions. It is in your interests to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

LATE SUBMISSION OF WORK: All assessment tasks must be submitted by the official due date and time. In the case of a late submission for a non-timed assessment (e.g. an assignment), if special consideration has NOT been granted, 20% of the earned mark will be deducted for each 24-hour period (or part thereof) that the submission is late for the first 2 days (including weekends and/or public holidays). For example, if an assignment is submitted 25 hours late, its mark will attract a penalty equal to 40% of the earned mark. After 2 days (including weekends and public holidays) a mark of 0% will be awarded. Timed assessment tasks (e.g. tests, examinations) do not fall under these rules.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Delivery

One 2 hour lecture per week.

One 2 hour Small Group Teaching Activity (SGTA) per week.

Resources

No single book covers the content of FOSE1005 precisely. Each of the following books contains material useful and relevant to the unit.

Recommended books

1.   Mathematics for Sustainability (free download from Macquarie University internet connection) The book's website.
2.   Maths for Chemists
3. Active Prelude to Calculus by Boelkins. Extensive videos here.
4. Active Calculus by Boelkins et al
5. Modeling Life by Garfinkel et al (free download from Macquarie University internet connection)
6. MUMS modules. Material from the Numeracy Centre.
7. Precalculus by Stitz and Zeager. See 3rd corrected edition.
8. Precalculus by Collingwood et al

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult iLearn for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Week	Beginning	Lecture topic
1	24/2/2020	Computation and Measurement
2	2/3/2020	Equations, symbolic representation and manipulation

3	9/3/2020	Displaying data and interpreting graphs
4	16/3/2020	Oscillatory behaviour
5	23/3/2020	Growth and decay
6	30/3/2020	Rates of change: use and interpretation
7	6/4/2020	Calculation of rates of change
Mid Session Break		
8	28/4/2020	Optimization
9	4/5/2020	Accumulation of change
10	11/5/2020	Fundamental Theorem of Calculus: connecting rates of change and accumulated change
11	18/5/2020	Employability
12	25/5/2020	Employability
13	1/6/2020	Employability

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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 **(Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

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

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/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.