



COGS2020

Experimental Design and Data Analysis for the Cognitive and Brain Sciences

Session 1, Weekday attendance, North Ryde 2020

Department of Cognitive Science

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

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Credit points

10

Prerequisites

STAT1170 or STAT170

Corequisites

Co-badged status

Unit description

In this unit, students will learn essential principles of experimental design and data analysis skills for research in the cognitive and brain sciences. Students will gain first-hand experience applying these skills by analysing real-life behavioural and neural data sets such as those from fMRI, MEG, and EEG. Students will learn the R programming language, which is widely used throughout the statistics and data science communities in academia and private industry. Topics covered include programming statistical analyses and visualising data in R, effective experimental design for hypothesis testing, and critically examining the results of statistical analyses in the cognitive and brain sciences.

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: Program statistical analyses using the R programming language.

ULO2: Generate data visualisations and publication-quality summary figures using the R programming language.

ULO3: Design experiments and apply appropriate statistical methods to test hypotheses in the cognitive and brain sciences.

ULO4: Interpret and critically evaluate the results of statistical analyses.

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

Late Penalty

Late submission of an assignment will attract a penalty of 5% of the maximum mark for every day that the assignment is late (including weekend days). For example, if the assignment is worth 40 marks and your assignment is submitted 2 days late, a penalty of $2 \times 5\% \times 40 = 4$ marks will be applied and subtracted from the awarded mark for the assignment. Work submitted more than 14 days after the submission deadline will not be marked and will receive a mark of 0. Please note that it is the student's responsibility to notify the University of a disruption to their studies and that requests for extensions for assignments must be made via the University's Ask MQ System (as outlined in the [Disruption to Studies Policy](#)).

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

Lectures are 1-hour sessions held twice per week, starting in Week 1. Lectures run from 12:00 PM - 1:00 PM Wednesdays in the T1 Theatre, 17 Wallys Walk, and from 1:00 PM - 2:00 PM Fridays in the T4 Theatre, 14 Sir Christopher Ondaatje Ave.

Readings

The primary reading source for this course are the weekly lecture notes, which will be made available via the course iLearn page. Any supplemental reading will be linked in the lecture notes.

iLearn

Through iLearn you will be able to access the lecture recordings (Echo360), readings, and

feedback and marks for the assessment tasks. You are also required to submit all assignments via iLearn, using the Turnitin submission tool. You will need access to the internet to access iLearn.

Mid-term exam

There will be a mid-term exam which will assess all material covered in lectures, weekly problem sets, and tutorial sessions up to the point at which the exam is given. Students will need to be physically present in the lecture room (or any other on-campus location designated at a later time) for this exam. If you are unable to sit the mid-semester exam at the specified time, you must advise the Student Centre via ask.mq.edu.au and must also apply for Special Consideration through ask.mq.edu.au and submit appropriate supporting documents. Original documents need to be presented at the Student Centre. This should be done within five (5) working days from the day of the examination. It should be noted that Macquarie University Policy states: "Pre-booked holidays will not routinely be considered unavoidable absences or commitments by the University". Students deemed eligible for a late mid-semester exam will be notified via email about the time and location of the exam.

Final exam

There will be a mid-term exam which will assess all material covered in lectures, weekly problem sets, and tutorial sessions up to the point at which the exam is given, including material that appeared on the mid-term exam. The time and location for this exam will be timetabled centrally and announced later in the semester. You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations (http://students.mq.edu.au/student_admin/exams/). The only exception to sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for special consideration due to disruption to studies. Information about unavoidable disruption and the special consideration process is available at: <http://students.mq.edu.au/study/my-study-program/special-consideration>. If a Supplementary Examination is granted as a result of the Special Consideration process, the examination will be scheduled after the conclusion of the official examination period. The format of a supplementary examination is at the unit convenor's discretion and is subject to change from the original final examination. Supplementary Exams are only offered to students who have satisfactorily completed all other assessments for the unit and were unable to sit the final exam because of documented illness or unavoidable disruption. If a Supplementary Exam has been granted, it is the student's responsibility to ensure they sit the Supplementary Exam on the specified date. You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, which is the final day of the official examination period.

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-centr](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-centr)

al). 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) (<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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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.