COGS7010
Research Frontiers in Cognitive Science
Session 1, Fully online/virtual 2021
Department of Cognitive Science

Contents

General Information ........................................... 2
Learning Outcomes ............................................ 3
General Assessment Information .......................... 3
Assessment Tasks ............................................. 3
Delivery and Resources ..................................... 6
Unit Schedule .................................................. 7
Policies and Procedures .................................... 7
Changes from Previous Offering ....................... 9
Statement on academic courtesy ........................ 9
Statement on social inclusion and diversity .......... 9

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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
Convenor, Lecturer
Anina Rich
anina.rich@mq.edu.au

Lecturer
Lyndsey Nickels
lyndsey.nickels@mq.edu.au

Lecturer
Amanda Robinson
amanda.robinson@sydney.edu.au

Lecturer
Paul Sowman
paul.sowman@mq.edu.au

Credit points
10

Prerequisites
Admission to MRes

Corequisites

Co-badged status

Unit description
You will engage in critical research issues in cognitive science. We examine the assumptions and methodological issues of the main techniques used across the different fields of cognitive science (e.g., neuroimaging, behavioural, and neuropsychological techniques). The unit will include seminars by experts in the various techniques and student-led analyses of recently published papers. The aim is to provide you with the tools to critically appraise published studies and the inferences made on the basis of experimental data. Activities are based on seminar attendance, directed reading of research articles, and critical discussion of research in both written and oral form.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates
Learning Outcomes

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

**ULO1**: identify the key critical issues in common methods used in cognitive science.

**ULO3**: demonstrate an advanced understanding of the methods available for research into cognitive science.

**ULO2**: provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations.

**ULO4**: demonstrate an advanced understanding of the common underlying assumptions in studying cognition.

**ULO5**: clearly articulate an argument in written and oral form to a variety of audiences.

**ULO6**: critically analyse information from a variety of sources.

**ULO7**: Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research.

General Assessment Information

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 7 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 requests for extensions for assignments must be made via the University’s Ask MQ System (as outlined in the [Special Consideration Policy](#)).

For written assignments, there will be 5% leeway in the word limit (e.g., up to 100 words over 2000), but beyond that you will be penalised 5% of your report mark for every further 100 words over the limit.

Questions about the assessment tasks?

Please email the unit convenor for clarification or questions about any of the assessments - the convenor is happy to discuss essay directions in advance of submission if necessary.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-class participation</td>
<td>10%</td>
<td>No</td>
<td>ongoing</td>
</tr>
<tr>
<td>Leading journal club</td>
<td>10%</td>
<td>No</td>
<td>student selected</td>
</tr>
<tr>
<td>Critical paper review</td>
<td>30%</td>
<td>No</td>
<td>2 weeks after leading journal club (by 5pm)</td>
</tr>
<tr>
<td>Name</td>
<td>Weighting</td>
<td>Hurdle</td>
<td>Due</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------</td>
<td>--------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Critical issues essay</td>
<td>50%</td>
<td>No</td>
<td>10/06/2021 (by 5pm)</td>
</tr>
</tbody>
</table>

**In-class participation**

Assessment Type 1: Participatory task  
Indicative Time on Task 2: 26 hours  
Due: ongoing  
Weighting: 10%

This assessment involves participating, discussing and contributing ideas in class.

On successful completion you will be able to:
- identify the key critical issues in common methods used in cognitive science.
- provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations.
- clearly articulate an argument in written and oral form to a variety of audiences.
- Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research.

**Leading journal club**

Assessment Type 1: Presentation  
Indicative Time on Task 2: 6 hours  
Due: student selected  
Weighting: 10%

This assessment involves selecting an academic research paper and leading a student group discussion.

On successful completion you will be able to:
- identify the key critical issues in common methods used in cognitive science.
- provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations.
- demonstrate an advanced understanding of the common underlying assumptions in studying cognition.
- clearly articulate an argument in written and oral form to a variety of audiences.
- Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research.
Critical paper review

Assessment Type 1: Report
Indicative Time on Task 2: 26 hours
Due: 2 weeks after leading journal club (by 5pm)
Weighting: 30%

This assessment mimics the task of a pre-publication review, and provide a critical analysis of the selected paper, pointing out problems that should be addressed or issues that could be improved. The review needs to include a brief summary of the academic paper, identifying major and minor issues, discussing the implications and making constructive recommendations for changes that could improve the study. 1500 words maximum.

On successful completion you will be able to:

• identify the key critical issues in common methods used in cognitive science.
• demonstrate an advanced understanding of the methods available for research into cognitive science.
• provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations.
• demonstrate an advanced understanding of the common underlying assumptions in studying cognition.
• clearly articulate an argument in written and oral form to a variety of audiences.
• critically analyse information from a variety of sources.
• Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research.

Critical issues essay

Assessment Type 1: Essay
Indicative Time on Task 2: 40 hours
Due: 10/06/2021 (by 5pm)
Weighting: 50%

This assessment requires writing a 3000 word essay about key critical issues in cognitive science covered during the course.

On successful completion you will be able to:

• identify the key critical issues in common methods used in cognitive science.
• demonstrate an advanced understanding of the methods available for research into cognitive science.
• provide critical analysis when reading academic research papers, and critically evaluate
scientific methods, results and interpretations.

• demonstrate an advanced understanding of the common underlying assumptions in studying cognition.
• clearly articulate an argument in written and oral form to a variety of audiences.
• critically analyse information from a variety of sources.
• Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research.

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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 Learning Skills Unit 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

ABOUT THIS UNIT

This unit will engage students in critical research issues in cognitive science. We examine the assumptions and methodological issues of the main techniques used across the different fields of cognitive science (e.g., neuroimaging, behavioural, and neuropsychological techniques). The course will include lectures by experts in the various techniques and student-led analysis of recent published papers. The aim is to provide students with the tools to critically appraise published studies and the inferences made on the basis of experimental data. Activities are based on seminar attendance, directed reading of research articles, and critical discussion of research in both written and oral form.

Delivery

There will be 13 weekly seminars that run for 2 hours each, conducted via Zoom.

Seminars will start in Week 1 of Session 1 on Fridays from 9-11am, except for the week of the Good Friday public holiday, which we will hold at a mutually convenient time earlier that week.

100% attendance to the weekly seminars is expected. If there are any issues with attendance, please email Prof. Anina Rich in advance of the class. All students have to participate in the discussion in the journal club seminars, which requires thorough reading of the assigned papers.

Resources

The required readings for this unit will be nominated by students.

Recommended readings will be given by lecturers for each lecture and are available on iLearn in

https://unitguides.mq.edu.au/unit_offerings/140305/unit_guide/print
advance of the lecture.

Slides and readings from each lecture will be available on this unit's iLearn page.

## Unit Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Week 1)</td>
<td>Overview &amp; experiment design/analysis</td>
</tr>
<tr>
<td>(Week 2)</td>
<td>Behavioural papers</td>
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<tr>
<td>(Week 3)</td>
<td>Functional Magnetic Resonance Imaging (fMRI)</td>
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<td>(Week 4)</td>
<td>fMRI papers</td>
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<tr>
<td>(Week 5)</td>
<td>Patient studies (single case vs. group)</td>
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<tr>
<td>(Week 6)</td>
<td>Patient papers</td>
</tr>
<tr>
<td></td>
<td><em>Mid-Semester Break</em></td>
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<td></td>
<td><em>Mid-Semester Break</em></td>
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<tr>
<td>(Week 7)</td>
<td>Electroencephalography (EEG)</td>
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<tr>
<td>(Week 8)</td>
<td>EEG papers</td>
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<tr>
<td>(Week 9)</td>
<td>Magnetoencephalography (MEG)</td>
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<tr>
<td>(Week 10)</td>
<td>MEG papers</td>
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<tr>
<td>(Week 11)</td>
<td>Neural stimulation</td>
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<tr>
<td>(Week 12)</td>
<td>Neural stimulation papers</td>
</tr>
<tr>
<td>(Week 13)</td>
<td>Summing up</td>
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</tbody>
</table>

## 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
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 Enquiry Service
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

Equity 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.

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.

Changes from Previous Offering
Due to special circumstances (i.e., COVID-19), for 2021, this course will be entirely online, over Zoom.

Statement on academic courtesy
It is the right of each student to learn in an environment that is free of disruption and distraction. Please arrive to all classes on time, and if you are unavoidably detained, please enter as quietly as possible to minimise disruption. Phones, pagers, and other electronic devices that produce noise and other distractions must be turned off prior to entering class. Where your own device (e.g., laptop) is being used for class-related activities, you are asked to close down all other applications to avoid distraction to you and others.

COGS7010 involves methods that allow us to study the brain. We therefore may use images and videos of human brains and dissections, as well as discussing patients with brain damage and animal research. It is a discussion-based interactive course, which means all students need to feel comfortable contributing to class conversations. Please treat both staff and your fellow students with the utmost respect.

Statement on social inclusion and diversity
Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others on the basis of their sex, gender, race, marital status, carers’ responsibilities, disability, sexual preference, age, political conviction or religious belief. All staff and students are expected to
display appropriate behaviour that is conducive to a healthy learning environment for everyone. The Unit Convenor is a member of the Ally Network and an active supporter of equity and diversity at Macquarie University. She is happy to provide additional support if needed.