COGS2250
Cognitive and Brain Sciences Laboratory
Session 2, In person-scheduled-weekday, North Ryde 2023

School of Psychological Sciences

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General Information

Unit convenor and teaching staff
Co-convenor
Paul Sowman
paul.sowman@mq.edu.au

Co-convenor
Jordan Wehrman
jordan.wehrman@mq.edu.au

Credit points
10

Prerequisites
Admission to BCogBrainSc and COGS2000 or COGS202

Corequisites

Co-badged status

Unit description
This unit will help students develop the knowledge and skills required to conduct research in the cognitive and brain sciences. Students will have the opportunity to participate in all stages of the research process including experimental design, experiment programming, data collection, data analysis, and reporting results. A primary focus of this unit will be to foster the development of practical laboratory skills including appropriate research notetaking and scientific record keeping, professional conduct in laboratory and research settings, and effective scientific communication in both oral and written form.

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 and apply research and problem solving skills.
  ULO2: Design and program a simple experiment.
ULO3: Perform appropriate statistical analyses on collected research data.
ULO4: Work professionally, safely, and ethically in a research environment.
ULO5: Display effective scientific communication in written and oral form.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research participation</td>
<td>10%</td>
<td>No</td>
<td>Throughout session, see iLearn for exact dates</td>
</tr>
<tr>
<td>Registration report</td>
<td>20%</td>
<td>No</td>
<td>Monday 25 September (start of Week 8)</td>
</tr>
<tr>
<td>Problem sets</td>
<td>35%</td>
<td>No</td>
<td>Throughout session, see iLearn for exact dates</td>
</tr>
<tr>
<td>Research poster presentation</td>
<td>35%</td>
<td>No</td>
<td>Week 13</td>
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</tbody>
</table>

Research participation

Assessment Type 1: Participatory task
Indicative Time on Task 2: 5 hours
Due: Throughout session, see iLearn for exact dates
Weighting: 10%

Participation in and running of experiments for student-led research projects.

On successful completion you will be able to:
• Work professionally, safely, and ethically in a research environment.

Registration report

Assessment Type 1: Report
Indicative Time on Task 2: 20 hours
Due: Monday 25 September (start of Week 8)
Weighting: 20%

Highly scaffolded and structured report that outlines the plan for the student-led research project (max. 1000 words).
On successful completion you will be able to:

- Demonstrate and apply research and problem solving skills.
- Design and program a simple experiment.
- Work professionally, safely, and ethically in a research environment.
- Display effective scientific communication in written and oral form.

Problem sets
Assessment Type: Problem set
Indicative Time on Task: 25 hours
Due: Throughout session, see iLearn for exact dates
Weighting: 35%

Problem sets distributed throughout the session that give students the opportunity to program experiments and comment on code.

On successful completion you will be able to:

- Demonstrate and apply research and problem solving skills.
- Design and program a simple experiment.
- Perform appropriate statistical analyses on collected research data.
- Display effective scientific communication in written and oral form.

Research poster presentation
Assessment Type: Presentation
Indicative Time on Task: 35 hours
Due: Week 13
Weighting: 35%

Research poster presenting the student-led research project.

On successful completion you will be able to:

- Demonstrate and apply research and problem solving skills.
- Perform appropriate statistical analyses on collected research data.
- Work professionally, safely, and ethically in a research environment.
- Display effective scientific communication in written and oral form.
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.

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

<table>
<thead>
<tr>
<th>COGS2250 – Cognitive and Brain Sciences Laboratory (S2 2023) – Proposed outline, subject to change</th>
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<tbody>
<tr>
<td><strong>Date</strong></td>
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</table>
| **Week 1** | Unit introduction & the replication crisis | • Introductions  
• Data storage (and naming) essentials  
• Download software (PsychoPy, R, RStudio)  
• Emotiv refresher |  |
| **Week 2** | Designing experiments | • Methods Matter (How to read a method section)  
• Data collection ERP study part I | Research Participation |
| **Week 3** | Designing experiments (continued) | • PsychoPy Lesson 1  
• Work on PS1 | Submit PS1 – PsychoPy |
| **Week 4** | Semantic priming need to knows | • PsychoPy Lesson 2 |  |
| **Week 5** | Challenging the automaticity of semantic priming | • PsychoPy Lesson 3  
• Data collection ERP study part II | • Research participation  
• Submit PS2 – PsychoPy |
| **Week 6** | Let’s replicate & pre-register! | • PsychoPy Lesson 4  
• Catch-up/PsychoPy help/Registration report support |  |
### Unit guide COGS2250 Cognitive and Brain Sciences Laboratory

#### 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
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

### Week 7

<table>
<thead>
<tr>
<th></th>
<th>What’s in store for the rest of this Session?</th>
<th>PsychoPy Lesson 5</th>
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<tbody>
<tr>
<td></td>
<td>Priming &amp; neuroimaging</td>
<td>Work on PS3</td>
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<tr>
<td></td>
<td></td>
<td>Download software (Jamovi, MatLab, EEGLAB)</td>
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Submit PS3 – Your experiment

### Break

### Week 8

<table>
<thead>
<tr>
<th></th>
<th>Our behavioural data</th>
<th>Selection of class experiment scripts</th>
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<tr>
<td></td>
<td></td>
<td>Semantic priming RT data ERP study (using R)</td>
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Submit Registration report

### Week 9

<table>
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<tr>
<th></th>
<th>Statistics outputs</th>
<th>Behavioural data ERP study analysis (using Jamovi)</th>
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<td>Research participation</td>
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### Week 10

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<tr>
<th></th>
<th>From EEG to ERP</th>
<th>EEG data processing (using EEGLAB)</th>
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<tr>
<td></td>
<td></td>
<td>Submit PS4 – Group RT data analysis class ERP study</td>
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### Week 11

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<tr>
<th></th>
<th>Research communication &amp; data visualisation</th>
<th>ERP analysis</th>
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### Week 12

<table>
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<tr>
<th></th>
<th>Unit review &amp; Q&amp;A</th>
<th>Poster preparation &amp; support</th>
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<tr>
<td></td>
<td></td>
<td>Submit PS5 – ERP waveforms</td>
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</table>

### Week 13

<table>
<thead>
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<th></th>
<th>Poster presentations</th>
<th>Poster presentations</th>
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<tr>
<td></td>
<td></td>
<td>Submit poster &amp; accompanying write-up</td>
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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.edu.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

**Academic Integrity**

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

**Student Support**

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

**The Writing Centre**

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the 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

Macquarie University offers a range of Student Support Services including:

- **IT Support**
- **Accessibility and disability support** with study
- **Mental health support**
- **Safety support** to respond to bullying, harassment, sexual harassment and sexual assault
- **Social support** including information about finances, tenancy and legal issues
- **Student Advocacy** provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via [AskMQ](https://www.mq.edu.au/about_us/offices_and_units/information_technology/help/), or contact [Service Connect](https://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/](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 since First Published

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td>23/07/2023</td>
<td>Staff contacts changed.</td>
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