MEDI7004
Decoding the Brain
Session 1, Weekday attendance, North Ryde 2021

Medicine, Health and Human Sciences Faculty level units

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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.

https://unitguides.mq.edu.au/unit_offerings/134975/unit_guide/print
General Information

Unit convenor and teaching staff
Jennifer Rowland
jen.rowland@mq.edu.au

Credit points
10

Prerequisites
Admission to MRes and ((MEDI204 or MEDI2300) or (BIOL257 or BIOL2230) or (PSY354 or PSYU3354))

Corequisites

Co-badged status

Unit description
This unit will introduce students to contemporary approaches to the investigation of brain structure and function. You will focus on applying rapidly developing technologies to unravel the complex organisation of the brain circuits that underlie movement, sensation and homeostatic function. You will be introduced to strategies and tools, including the genetic, optical, electronic and analytical tools neuroscientists use to probe the workings of the brain. You will also be introduced to the obstacles that will need to be overcome if future scientists are to explain the most complex structure in the known universe.

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: Explain the functional organization of the nervous system as it pertains to the transmission of information between neurons, the conduction of electrical activity ultimately the encoding of information within the various functional systems of the nervous system, and describe the key experimental observations through which those insights were gained.

ULO2: Demonstrate proficient knowledge of current research techniques used in neuroscience and design experiments that use them to answer questions relating to structure and function of the brain or the development of novel experimental or analytical
techniques.

**ULO3:** Critically evaluate the neuroscience literature and identify current gaps in knowledge or misconceptions relating to a topic of their choice.

**ULO4:** Analyze and interpret real experimental data.

**ULO5:** Demonstrate proficient skills in research communication and self-directed learning by reviewing and appraising the contemporary neuroscience literature and conveying their findings to their peers.

### General Assessment Information

Grade descriptors and other information concerning grading are contained in Schedule 1 of the Macquarie University Assessment Policy, which is available at: [https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment)

Further details for each assessment task will be available on iLearn.

All final grades in the Master of Research are determined by a grading committee and are not the sole responsibility of the Unit Convenor.

Students will be awarded a final grade plus a Standardised Numerical Grade (SNG). The SNG is not necessarily a summation of the individual assessment components. The final grade and SNG that are awarded reflect the corresponding grade descriptor in the Grading Policy.

To pass this unit, students must demonstrate sufficient evidence of achievement of the learning outcomes, attempt all assessment tasks, meet any ungraded requirements including professionalism and achieve an SNG of 50 or better.

### Student Professionalism

In the Faculty of Medicine, Heath & Human Sciences, professionalism is a key capability embedded in all our courses. As part of developing professionalism, students are expected to attend all small group interactive sessions including tutorials, as well as clinical- and laboratory-based practical sessions.

Furthermore, lectures and seminars are key learning activities that you are expected to attend throughout completion of the Master of Research program. While audio recordings and lecture slides may be made available following these large group sessions, it is important to recognise that such resources are a study aid - and should not be considered an alternative to lecture or seminar attendance.

Students who do not maintain adequate attendance (greater than or equal to 80% of scheduled classes) may be deemed unable to meet expectations regarding professionalism and may be referred for disciplinary action (which may include exclusion from assessments and unit failure). Similarly, as part of developing professionalism, students are expected to submit all work by the due date. Applications for assessment task extensions must be supported by appropriate evidence and submitted via ask.mq.edu.au. For further details please refer to the Special Consideration Policy available at [https://students.mq.edu.au/study/my-study-program/special-consideration](https://students.mq.edu.au/study/my-study-program/special-consideration)
Late Submission

All assignments which are officially received after the due date, and where no extension has been granted, will incur a deduction of 10% for the first day, and 10% for each subsequent day including the actual day on which the work is received. Weekends and public holidays are included.

For example:

<table>
<thead>
<tr>
<th>Due date</th>
<th>Received</th>
<th>Days Late</th>
<th>Deduction</th>
<th>Raw Mark</th>
<th>Final Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday 14th</td>
<td>Mon 17th</td>
<td>3</td>
<td>30%</td>
<td>75%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal Club Presentation</td>
<td>20%</td>
<td>No</td>
<td>once per session, rostered</td>
</tr>
<tr>
<td>In class test</td>
<td>15%</td>
<td>No</td>
<td>2/3/21</td>
</tr>
<tr>
<td>Journal Article Review</td>
<td>25%</td>
<td>No</td>
<td>19/4/21</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
<td>No</td>
<td>Exam Period</td>
</tr>
</tbody>
</table>

Journal Club Presentation

Assessment Type: Presentation
Indicative Time on Task: 20 hours
Due: once per session, rostered
Weighting: 20%

You will participate in and occasionally present during weekly student-led journal clubs that considers contemporary neuroscience articles.

On successful completion you will be able to:

- Critically evaluate the neuroscience literature and identify current gaps in knowledge or misconceptions relating to a topic of their choice.
- Analyze and interpret real experimental data.
- Demonstrate proficient skills in research communication and self-directed learning by reviewing and appraising the contemporary neuroscience literature and conveying their findings to their peers.
In class test
Assessment Type 1: Examination
Indicative Time on Task 2: 10 hours
Due: 2/3/21
Weighting: 15%

You will face two ‘open book’ in-class challenges in which they are presented with a number of hypotheses or challenges and are asked to design an experiment to address them or to interpret a piece of data.

On successful completion you will be able to:

• Explain the functional organization of the nervous system as it pertains to the transmission of information between neurons, the conduction of electrical activity ultimately the encoding of information within the various functional systems of the nervous system, and describe the key experimental observations through which those insights were gained.

• Demonstrate proficient knowledge of current research techniques used in neuroscience and design experiments that use them to answer questions relating to structure and function of the brain or the development of novel experimental or analytical techniques.

• Analyze and interpret real experimental data.

Journal Article Review
Assessment Type 1: Report
Indicative Time on Task 2: 15 hours
Due: 19/4/21
Weighting: 25%

1000-word review that critically appraises a recently published Neuroscience research article.

On successful completion you will be able to:

• Explain the functional organization of the nervous system as it pertains to the transmission of information between neurons, the conduction of electrical activity ultimately the encoding of information within the various functional systems of the nervous system, and describe the key experimental observations through which those insights were gained.

• Demonstrate proficient knowledge of current research techniques used in neuroscience and design experiments that use them to answer questions relating to structure and function of the brain or the development of novel experimental or analytical techniques.

• Critically evaluate the neuroscience literature and identify current gaps in knowledge or
misconceptions relating to a topic of their choice.

- Demonstrate proficient skills in research communication and self-directed learning by reviewing and appraising the contemporary neuroscience literature and conveying their findings to their peers.

Final Exam

Assessment Type: Examination
Indicative Time on Task: 25 hours
Due: Exam Period
Weighting: 40%

You will face two ‘open book’ in-class challenges in which they are faced with a number of hypotheses or challenges and are asked to design an experiment to address them or to interpret a piece of data.

On successful completion you will be able to:

- Explain the functional organization of the nervous system as it pertains to the transmission of information between neurons, the conduction of electrical activity ultimately the encoding of information within the various functional systems of the nervous system, and describe the key experimental observations through which those insights were gained.
- Demonstrate proficient knowledge of current research techniques used in neuroscience and design experiments that use them to answer questions relating to structure and function of the brain or the development of novel experimental or analytical techniques.
- Analyze and interpret real experimental data.

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

Teaching Platforms

In 2021 content will be delivered via a combination of synchronous and asynchronous electronic media. Unless otherwise indicated on iLearn, Lectures will be prerecorded and embedded on
iLearn; **Tutorials** and **Workshops** will be delivered in person or, in some cases, via electronic conferences tools such as Zoom. Some content will be delivered using the **Flipped Classroom** approach, in which students are provided with a topic and relevant resources and asked to prepare oral or written content on that topic. Instructions will be provided in advance on iLearn. Questions can be directed to teaching staff, other students or the unit convenor via iLearn.

**Technology Used**

Active participation in the learning activities throughout the unit will generally require students to have access to an internet-connected tablet, laptop or similar device. Students who do not own their own laptop computer may borrow one from the university library.

**Required Unit Materials**

All students are required to wear closed shoes and a lab coat/gown to attend practical classes and assessments in a laboratory venue.

**Recommended Readings**

Unit readings for this unit are available via iLearn.

**Unit Schedule**

**Lectures**

Each week students will receive two 1-hour lectures by an expert in the field. Lectures will be delivered online in **prerecorded video** format or students will prepare their own material on a topic in a **Flipped** format, using resources provided in advance. Flipped classrooms will use synchronouse video (e.g. Zoom) or asynchronous text (e.g. iLearn Forum) technologies. Students are required to read the learning material associated with each lecture available via iLearn in advance and to participate in discussion.

**Journal Club**

Journal Club is a commonly used method of developing researchers' critical thinking and presentation skills while familiarising them with the recent scientific literature. The format is an hour-long student-led discussion: each week a different student is rostered to select a recently published research article, which they will distribute in advance to other members of the group. At Journal Club the Presenting Student gives an overview of the Background, Methods and Results of the paper, with visual guides as appropriate, and leads a critique of the paper. Journal Club is an interactive activity - the Presenter is supposed to lead the discussion, but all members of the group are expected to contribute to the conversation.

The Unit Convenor will explain the format, provide an example presentation, and develop a roster for subsequent presentations.

**Workshops/Tutorials**

Each week students will participate in a 1-hour workshop related to the learning activities for
that week. This will involve computer and wet laboratory visits that may include handling human and animal specimens, prerecorded or synchronous online discussions, or in-person tutorials.

**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/admin/other-resources/student-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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](http://students.mq.edu.au/support/)

**Learning Skills**

Learning Skills ([mq.edu.au/learningskills](https://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.