



# PSY 236

## Biopsychology and Learning

S2 Day 2016

*Department of Psychology*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

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C3A 410

By Appointment

Lecturer

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C3A 412

By Appointment

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Credit points

3

Prerequisites

[PSYC104(P) and PSYC105(P)] or [(STAT122(P) or STAT170(P) or STAT171(P) or PSY122(P)) and (PSY104(P) or PSYC104(P)) and (PSY105(P) or PSYC105(P))] or [admission to GDipPsych] or [((PSY104(P) and PSY122(P)) or PSYC104(P)) and admission to BA-PsychLLB]

Corequisites

Co-badged status

Unit description

This unit is designed to give students a basic knowledge of central neuronal mechanisms underlying fundamental behaviours and how these behaviours are modified through experience (learning). The first half of the program describes the cytoarchitecture of central and peripheral neurons; the physiological and ionic bases of axonal and synaptic transmission; the overall anatomical organisation of the mammalian brain, and; sensory processing. These topics are followed by discussion on the central mechanisms underlying mammalian behaviours, such as motivation and psychopathology. The latter half of the program provides a basic understanding of diverse phenomena in learning and behaviour, including classical conditioning and operant conditioning.

## 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:

Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.

Communication and information technology skills: using electronic databases to search for papers in relevant topics.

Written and oral communication skills: participating in class discussions.

Self-awareness skills: identifying and setting targets, time management.

Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.

Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## Assessment Tasks

Name	Weighting	Due
<a href="#">Topic On-Line Quiz</a>	0%	As needed
<a href="#">Mid-Session Test</a>	30%	9/9/16
<a href="#">Research Report</a>	30%	7/10/16
<a href="#">Final Exam</a>	40%	Examination Period

### Topic On-Line Quiz

Due: **As needed**

Weighting: **0%**

Quiz (5 questions) covering topics of the past week for early feedback on learning progress.

On successful completion you will be able to:

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Self-awareness skills: identifying and setting targets, time management.

- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## Mid-Session Test

Due: **9/9/16**

Weighting: **30%**

A 45 minute test (30 multiple choice questions each with five response options) to be held during the scheduled review session (W6D) in week 6 (**Friday 9th September**) from **11am-12 pm or 12 - 1 pm**. Students will be allocated to one of the one hour test timeslots. This paper will examine material covered in the week 1-5 lecture topics, in addition to material from both neuroanatomy practicals.

On successful completion you will be able to:

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Self-awareness skills: identifying and setting targets, time management.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## Research Report

Due: **7/10/16**

Weighting: **30%**

A 1,000 word research report (plus 120 word abstract) based on a behavioural experiment will be **due 5pm on Friday 7th October**.

On successful completion you will be able to:

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Self-awareness skills: identifying and setting targets, time management.
- Information skills: formulating arguments, judging the relevance and accuracy of

information, comparing different points of view.

- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## Final Exam

Due: **Examination Period**

Weighting: **40%**

A 60 minute exam (40 multiple choice questions each with five response options) to be held during the **final examination period**. This will examine material covered in the week 7-12 lecture topics, in addition to material from learning practicals.

On successful completion you will be able to:

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Self-awareness skills: identifying and setting targets, time management.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## Delivery and Resources

### Classes

Lectures: All lectures will only be provided as topics by video recordings on-line (via iLearn).

Revision Sessions: 1 hr/week - Friday 11am-12pm or 12 - 1 pm in W6D Lotus Theatre (the first session will also be recorded and available on iLearn).

Practicals: Practical will be run on weeks 2, 4, 8, 10 (Stream A) and weeks 3, 5, 9, 11 (Stream B) in C5A 316/317 (i.e. each student does four practicals beginning week 2 or 3, depending on which stream they have been allocated).

Students in units which have streamed tutorials will be allocated a stream by the Psychology Office.

Managing Classes: Changes to all units can be done on-line via eStudent. After week 2, no further changes will be entertained unless supporting documentation about the reason for changing is provided and there is space in the tutorial you wish to change into.

Practical Attendance: Students must attend classes otherwise grades may be affected. Students enrolled in the composite attendance mode can access the iLecture recording of the lecture, but must attend the compulsory practical class.

## Required Texts

Kalat, J.W. (2007, 2009, 2013 or 2015). Biological Psychology (9th, 10th, 11th or 12th ed).

Domjan, M.P. (2005). The Essentials of Conditioning & Learning (3rd ed).

Alloway, T., Wilson, G. & Graham, J. (2012). Sniffy the virtual rat lite. Version 3.0..

Texts are on reserve in the library. Further recommended readings will be suggested during lecture time.

## Teaching and Learning Strategy

The unit will be taught weekly through on-line audio and video recordings of unit topics. These topics will be reviewed in 1 x 1 hr session (two streams available Friday 11am-12pm or 12 - 1pm) in the lecture theatre. There are also four compulsory practical classes (2 hrs each) as listed above.

Lectures: The lectures are designed to introduce students to relevant theories of biopsychology and learning. The reading associated with each lecture topic complements and extends the lecture material. Students should be self-directed in reading and summarising this information, and integrating it with the lectures.

Review Sessions: The review sessions are designed to give all students face-to-face review of the lecture material, with opportunity for question and answer time.

Practicals: Practical exams examine research and practical applications of the more theoretical material covered in lectures.

## Unit Schedule

Week	Lecture Date	Topic	Lecturer	Text	Practical
1	<u>Biopsychology</u> 5 August	Behavioural Neuroscience: Genetics	Cornish	Kalat Ch. 4	NO PRACTICAL
2	12 August	The Nervous Systems Brain Cells	Baracz	Kalat Ch. 1 & 3	Practical One Neuroanatomy I Kalat Ch. 2 & 3 (Stream A)
3	19 August	Neurophysiology Neurochemistry Communication by Receptors	Cornish	Kalat Ch. 1 & 2	Practical One Neuroanatomy I Kalat Ch. 2 & 3 (Stream B)

4	26 August	Neurotransmitters Neurotransmitter System Dysfunction	Cornish	Kalat Ch. 2, 14 & App. A	Practical Two Neuroanatomy II Kalat Ch. 3 & 4 (Stream A)
5	2 September	Substance Abuse Addiction	Cornish	Kalat Ch. 14	Practical Two Neuroanatomy II Kalat Ch. 3 & 4 (Stream B)
6	<u>Mid-Session Test</u> 9 September	Covers material from lecture topics week 1-5 and Neuroanatomy Pracs 1 & 2	Staff		NO PRACTICAL
7	16 September	Neurobiology of Learning and Memory	Cornish	Kalat Ch. 4 & 12	NO PRACTICAL
		Mid-Session Break			
8	<u>Learning</u> 7 October	Introduction to Learning Classical Conditioning I	Miller	Domjan Ch. 1-4	Practical Three Learning I (Sniffy) (Stream A)
9	14 October	Classical Conditioning II Principles and Applications of Classical Conditioning	Miller	Domjan Ch. 4-5	Practical Three Learning I (Sniffy) (Stream B)
10	21 October	Research on Classical Conditioning Introduction to Operant Conditioning	Miller	Domjan Ch. 7	Practical Four Learning II (Sniffy) (Stream A)
11	28 October	Schedules of Reinforcement Applications of Reinforcement	Miller	Domjan Ch. 8	Practical Four Learning II (Sniffy) (Stream B)
12	4 November	Extinction Punishment	Miller	Domjan Ch. 10-13	NO PRACTICAL
13	11 November	Learning Video	Miller		NO PRACTICAL

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students

should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, 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).

## 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](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)



## 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](http://ask.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/](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.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Self-awareness skills: identifying and setting targets, time management.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

### Assessment task

- Research Report

### Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

## **Learning outcomes**

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Self-awareness skills: identifying and setting targets, time management.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## **Assessment tasks**

- Mid-Session Test
- Final Exam

## **Commitment to Continuous Learning**

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

## **Learning outcomes**

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## **Assessment tasks**

- Topic On-Line Quiz
- Mid-Session Test
- Final Exam

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### Learning outcomes

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

### Assessment tasks

- Topic On-Line Quiz
- Mid-Session Test
- Research Report
- Final Exam

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

### Learning outcomes

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Communication and information technology skills: using electronic databases to search

for papers in relevant topics.

- Written and oral communication skills: participating in class discussions.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## **Assessment tasks**

- Mid-Session Test
- Research Report
- Final Exam

## **Problem Solving and Research Capability**

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## **Learning outcomes**

- Gain a general understanding of mechanisms of behavioural neuroscience, neurophysiology, neuropharmacology and learning.
- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Self-awareness skills: identifying and setting targets, time management.
- Information skills: formulating arguments, judging the relevance and accuracy of information, comparing different points of view.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## **Assessment tasks**

- Research Report
- Final Exam

## **Effective Communication**

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to

read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

## **Learning outcomes**

- Communication and information technology skills: using electronic databases to search for papers in relevant topics.
- Written and oral communication skills: participating in class discussions.
- Problem solving: comparing alternative interpretations of neuroscience data, formulating new explanations.

## **Assessment task**

- Research Report

## **Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

## **Learning outcome**

- Written and oral communication skills: participating in class discussions.

## **Socially and Environmentally Active and Responsible**

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

## **Learning outcome**

- Written and oral communication skills: participating in class discussions.