NEUR2201

Neuroscience Fundamentals

Course Outline
Term 2, 2022

School of Medical Sciences

Faculty of Medicine & Health

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1. Staff

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2. Course information

Units of credit: 6 UOC

Pre-requisite(s): 36 UOC, which must include 12 UOC of BABS / BIOS courses (or equivalent DPST courses) OR 12 UOC of PSYC courses.

Teaching times and locations:

Please note the teaching structure is different from prior years due to the COVID-19 pandemic and ongoing development of delivery approaches, staffing and content. In 2022, we will run all activities face to face, except for lectures. Lectures will be online via a combination of asynchronous and synchronous delivery. As per UNSW guidelines all face-to-face activities require a face mask.

Four two-week modules around a topic in Neuroscience. Each fortnightly module typically consists of:

- ➢ **1x synchronous (live) and 3x asynchronous (pre-recorded) online lectures with a live feedback Q&A session in the seminars.** We aim for this to be equivalent to the traditional structure of 4 x 1-hour face-to-face lectures with some time to chat to lecturers between and after classes. The face-to-face Q&A session is rostered on the Monday (11-12pm) seminar time slot in week 2 of each module.
- ➢ **Face-to-face practical activity.** A 3-hour practical class related to that fortnight's topic on every other Tuesday (10-1pm, or 2-5pm). Activities will vary and include a focus on specific techniques with practicing scientists, examining brain slides, analysing data, and online prac simulations. Details and further descriptions are on Moodle.
- ➢ A 2-hour **face-to-face tutorial** on every other Tuesday (10-12pm, or 2-4pm). Tutorials comprise a variety of activities aiming to re-inforce or complement the module theme and includes review or revision of the module content.
- ➢ A 2-hour fortnightly **face-to-face progress assessment** using the online Inspera quiz and (Moodle) workshop tool, held on Thursdays at the end of each Module (11-1pm, or 2-4pm). This includes some experience in critical evaluation via peer assessment, for which we have a special practice session in week 1.
- ➢ Week 1 is an **Introductory module** on the core elements of the brain, with 1x synchronous (live) online lecture and 1x asynchronous pre-recorded online lecture, a face-to-face practical class and a face-to-face progress assessment activity.

Please review the online timetable for teaching times and locations:

http://timetable.unsw.edu.au/2022/NEUR2201.html

The best place to see the latest course timetable is on the NEUR2201 Moodle website.

2.1 Course summary

Have you ever wondered what's inside your brain? Or why we see colours? Or why too much stress is bad for you? Or what controls our movements? The brain is like a super-computer that controls every aspect of the body, and it uses the nervous system as a network to relay information to parts of our body based on information from our internal and external environment.

In this introductory, multi-disciplinary, course we will unpack some of the "big questions" in neuroscience and try to understand the brain.

Each fortnight you will get the opportunity to explore a specific topic in neuroscience by engaging with discipline experts, participating in hands-on experiments and by working collaboratively with your peers. You will approach each topic from a scale ranging from molecular to cellular processes, through to the level of the whole animal. You will also develop an understanding of the strengths and limitations of current methods used to investigate problems in neuroscience.

By engaging in a team assignment, you will explore a Neuroscience topic of your choice and consider how complex research can be effectively and fairly communicated. Some previous topics have included how social media addiction rewires the brain; how classical music improves intelligence in infants, or

how effective psilocybin (*aka* magic mushrooms) can be in treating depression. This will develop your skills in information literacy, critical thinking and communication.

Fortnightly progress assessments will allow you to stay on top of the coursework and identify gaps in your knowledge and comprehension.

By the end of the course you will have a solid understanding of the fundamentals of neuroscience, and the methods used to investigate problems in neuroscience. The foundational knowledge you gain in this course will facilitate further study in discipline-focussed, more advanced, neuroscience subjects.

2.2 Course aims

The overall aim of the course is to introduce students to the study of Neuroscience through a focus on current Neuroscience topics. Each topic is approached from different discipline perspectives, and from a scale ranging from molecular and cellular processes, through to the level of the whole animal. We aim for this course to provide a solid introduction to neuroscience that will facilitate further study in discipline focussed, more advanced, Neuroscience subjects.

2.3 Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

CLO1: Demonstrate an **understanding** of the broad scope of neuroscience by communicating examples of how different disciplines contribute to the study of a common challenge in Neuroscience.

CLO2: Demonstrate an **understanding** of the major cellular and whole animal features related to areas such as Neurotrauma, Epilepsy, Plasticity and Addiction, Stress, and Motor Control Disorders.

CLO3: Demonstrate **insight** into the methods by which problems in neuroscience are investigated through a basic description of questions that may be addressed by such approaches and some limitations on the interpretations of this experimental data.

CLO4: Demonstrate **expertise** in locating and appraising information and succinctly presenting conclusions related to these enquiries by integrating media and scientific literature around a specific Neuroscience topic and presenting these conclusions in written and oral form.

CLO5: Demonstrate **skills in working collaboratively** within a small group by identifying strengths and weaknesses related to your teamwork experience and producing a coherent and well-integrated group project.

2.4 Relationship between course learning outcomes and assessments

NEUR2201 is a stage two course administered by the School of Medical Sciences. It is delivered across 9 teaching weeks in term 2, with synchronous and asynchronous learning activities and teaching equivalent to about five hours per week. Students can undertake NEUR2201 upon successful completion of 36 UoC, which must include 12 units of background courses in BABS, BIOS or PSYC, with many students completing the useful background courses: ANAT2511, BIOC2102, PHSL2101 and/or PSYC2081. NEUR2201 is a compulsory part of the neuroscience study plan in Advanced Science (NEURA13972) and in Science (NEURS13970) but is open to other students interested in neuroscience.

NEUR2201 is structured into an introductory week followed by four fortnight-long modules delivered by experts in their field. Each module includes a series of lectures, seminars, laboratory experience, tutorials and progress assessment. This format allows us to tackle some of the "big questions" in neuroscience.

Course Learning Outcome (CLO)	LO Statement	Related Tasks & Assessment
CLO 1	Demonstrate an **understanding** of the broad scope of neuroscience by communicating examples of how different disciplines contribute to the study of a common challenge in Neuroscience.	- Ongoing on-line assessment quizzes - Short answer practice & peer marking - Final exam
CLO 2	Demonstrate an **understanding** of the major cellular and whole animal features related to areas such as Neurotrauma, Epilepsy, Plasticity and Addiction, Stress, and Motor Control Disorders.	- Ongoing on-line assessment quizzes - Short answer practice & peer marking - Final exam
CLO 3	Demonstrate **insight** into the methods by which problems in neuroscience are investigated through a basic description of questions that may be addressed by such approaches and some limitations on the interpretations of this experimental data.	- Ongoing on-line assessment quizzes - Short answer practice & peer marking - Final exam
CLO 4	Demonstrate **expertise** in locating and appraising information and succinctly presenting conclusions related to these enquiries by integrating media and scientific literature around a specific Neuroscience topic and presenting these conclusions in written and oral form.	- Group project Neuroscience in the Media
CLO 5	Demonstrate **skills in working collaboratively** within a small group by identifying strengths and weaknesses related to your teamwork experience and producing a coherent and well-integrated group project.	- Group project Neuroscience in the Media

3. Strategies and approaches to learning

3.1 Learning and teaching activities

The philosophy underpinning this course and its Teaching and Learning Strategies is based on "Guidelines on Learning that Inform Teaching at UNSW". The teaching of Neuroscience Fundamentals is based on conceiving neuroscience as a core field of knowledge to which many different disciplines contribute. The course is structured in two-week modules that cover topics that are fundamental, but still active frontiers of investigation. Each topic is taught by several members of faculty drawn from different disciplines. In this way the scope and range of approaches in tackling

major issues in neuroscience are made clear. Neuroscience is primarily an experimental discipline and so a proper appreciation of neuroscience requires an understanding of both what is known, and of the limitations imposed by our study tools.

Lectures provide the concepts and theory essential for understanding neuroscience. Lectures are online, synchronous and asynchronous.

The **practical classes** inform on the research techniques and analytical skills related to the topic. These classes are face-to-face.

The **tutorials** are a mix of case presentations, video material, critical analysis of literature and informal discussion to support the exploration of the material in more depth. Tutorials are face-to-face.

Seminars allow for lecture and practical class revision and include a Q&A with the lecturers for that module. Seminars are face-to-face.

Tutorials and review sessions allow more interactive learning. A large part of the learning and teaching approach is working with your peers on neuroscience related topics.

The primary source of information for this course is the material delivered in lectures, tutorials and practicals, but effective learning can be enhanced through self-directed use of other resources such as textbooks. It is up to you to ensure you perform well in each part of the course; preparing for classes; completing assignments; studying for assessments and exams and seeking assistance to clarify your understanding.

3.2 Expectations of students

Students are reminded that UNSW recommends that a 6 units-of-credit course should involve about 150 hours of study and learning activities. The formal learning activities total approximately 50 hours throughout the term and students are expected (and strongly recommended) to do at least the same number of hours of additional study.

Students are expected to attend 100% of tutorials, practicals and assessment classes. Class rolls will be marked in the tutorials, practicals and assessment activities. If you are not able to attend these classes, you will have to apply for special consideration (see section 5.3).

Ethics for practical classes

Practicals involving the use of animal or human specimens are a privilege and must be treated with respect and professionalism. It is important to appreciate that all experiments reviewed in the practical classes involving the use of animal or human specimens have been conducted with approval from UNSW or equivalent ethics committees and adhere to the [Australian code of practice for the care and use of animals for scientific purpose](#)s, and the [National Statement of Ethical Conduct in Human Research.](#) Students are expected to adhere to these codes and practices.

Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. Those unwilling to follow these basic laboratory rules will be marked absent. **Enclosed shoes and face masks are compulsory in all practical classes.** These must completely cover the feet. **Some labs will require lab coats and goggles**. Punctual arrival is expected, and you are required to check-in using the Service NSW app once you enter the class. Practical classes that involve student participation may require the subject to sign a witnessed, informed consent form.

Please see Moodle and the Practical Lab Manuals for details and resources about each practical class and its Health and Safety requirements, and any pre-reading.

4. Course schedule and structure

Please review the latest timetable on Moodle, link here. This timetable is subject to changes.

Weekly course Structure and Modules		
Week 1 31 May	Module 1	1x Synchronous lecture; 1x Asynchronous lecture; Practical 1; Quiz & SAQ assessment
Week 2 7 June	Module 2	1x Synchronous lecture; 3x Asynchronous lectures; Practical 2; Wiki Topic Plan submission
Week 3 14 June		No Seminar on Monday 14 June – Public Holiday; Tutorial 1; Quiz & SAQ assessment
Week 4 21 June	Module 3	1x Synchronous lecture; 3x Asynchronous lectures; Practical 3
Week 5 28 June		Seminar (incl. Q&A); Tutorial 2; Quiz & SAQ assessment
Week 7 12 July	Module 4	1x Synchronous lecture; 3x Asynchronous lectures; Practical 4; Wiki Page Submission
Week 8 19 July		Seminar (incl. Q&A); Tutorial 3; Quiz & SAQ assessment; Wiki Presentation
Week 9 26 July	Module 5	1x Synchronous lecture; 3x Asynchronous lectures; Practical 5; Wiki Teamwork submission
Week 10 2 August		Tutorial 4; Quiz & SAQ assessment

Exam Period: 12 August – 25 August
Supplementary Exam Period: 5 September – 9 September

5. Assessment

5.1 Assessment tasks

Assessment task	Length	Weight	Due date and time
Assessment 1: Ongoing on-line assessment quizzes	10-20 min	20%	End of each module*.
Assessment 2: Short answer practice & peer marking	15-20 min for SAQ & 30 min for peer marking	20%	End of each module*.
Assessment 3: Group project Neuroscience in the Media	Wiki Page; 2500 words	20%	Ongoing; Final Wiki Page due in week 7 (Thursday 14 July)
Assessment 4: Final exam	2 hours	40%	Between 12 – 25 August

* Note that the end of module 1 is the end of week 1, subsequently modules are two weeks each.

Further information

UNSW grading system: https://student.unsw.edu.au/grades

UNSW assessment policy: https://student.unsw.edu.au/assessment

5.2 Assessment criteria and standards

Each module has one quiz and one SAQ & peer marking assessment. The group project is ongoing and starts in week 1.

Any assessments not completed on the due dates will be marked as zero unless special consideration is granted. For the final and progress quizzes/SAQs, this is typically in the form of a supplemental exam.

Supplementary Final Exam, if granted, will occur between 5-9 September.

Ongoing on-line assessment quizzes:

There are five quizzes in the course, one per module, and they are worth 20% of the final mark. Your mark is based on the four best of the five quizzes. The quizzes are run online using Inspera (in-class, invigilated) and will take about 10-20 min to complete. A variety of forms of assessment are used in the quizzes including multiple choice, single word answers, labelling figures and filling gaps in text. These quizzes will also help you keep up to date on the content and may include material from lectures, seminars, tutorials and practical activities. Immediate feedback is given, providing an indication on your level of study and understanding of the content from lectures, seminars, tutorials and practical classes in the preceding module.

Short answer practice & peer marking:

There are five short-answer questions (SAQs) & peer marking assessments, one per module, and they are worth 20% of the final mark. Your mark is based on the four best of the five quizzes. These assessments are run online using Moodle (in-class, invigilated) immediately after the module quiz. You will have 15-20 min to complete one or two SAQs, and ~ 30 min for peer-marking. This will be peer-marked using a provided marking scheme and may also be marked again by the tutors. This

helps you develop skills in critical evaluation. 50% of marks for this assessment are allocated for your own answers to the SAQs, and 50% of marks are allocated for your peer assessment (how close your score is to that of other markers and/or the tutors, and the justification of your score). Peer review enables you to get immediate feedback on short answer writing and on your own answer. You can flag your peer marker to be reviewed by the tutors if you disagree strongly with their mark. This type of assessment will help you keep up to date on the content, and also provide some generic skills on communication and critical evaluation, as well as learning tips for the final exam about what makes a good SAQ answer.

Group project Neuroscience in the Media:

The group project comprises submission of a group Wiki page on a Neuroscience topic of your choice, a presentation of a summary of this topic to the class (in tutorial 3), reflection on teamwork, and participation in critical appraisal of a peer's Wiki. You are also required to do a self-assessment of the quality of your Wiki page in week 5 (using a rubric and annotated example as a guide), with feedback received in week 6. This will allow you to address any issues with the group's Wiki page before submission in week 7.

The details of the various components are described in the Wiki link and Group Project E-book (under the Group Project tab) on Moodle.

Feedback and the mark on your Wiki page will be provided in week 11 and you will get immediate feedback from peers and tutors during your presentation.

Final exam:

The final exam is 2 hours long, and consists of multiple-choice questions, and five SAQs (one per module topic), of which you are required to answer four. The MCQs and SAQs will be similar in format to the practice SAQ assessments. This is an online exam using Inspera.

Marks will be incorporated into a final grade and released by UNSW.

5.3 Submission of assessment tasks

Late Submission

Late submissions will be penalized at 5% per day capped at five days (120 hours). Students will not be permitted to submit their assessments after this date.

Special Consideration

If you experience a short-term event beyond your control (exceptional circumstances) that impacts your performance in a particular assessment task, you can apply for Special Considerations.

You must apply for Special Consideration **before** the start of your exam or due date for your assessment, except where your circumstances of illness or misadventure stop you from doing so.

If your circumstances stop you from applying before your exam or assessment due date, you must **apply within 3 working days** of the assessment, or the period covered by your supporting documentation.

More information can be found on the [Special Consideration website.](#)

5.4. Feedback on assessment

You will receive immediate feedback on your progress quizzes and SAQs/peer marking.

For the group project, you will receive feedback on multiple occasions. Feedback on your Wiki topic plan is in week 3; feedback on your self-assessment of the quality of the Wiki is in week 6; feedback on

your Wiki presentation is immediately after your presentation in week 8; with feedback and a final mark for your Wiki page in week 11.

6. Academic integrity, referencing and plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Please use **APA referencing style** for the Wiki Group Project.

Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage.[1] At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

*Further information about academic integrity and **plagiarism** can be located at:*

- *The Current Students site https://student.unsw.edu.au/plagiarism, and*

- *The ELISE training site https://subjectguides.library.unsw.edu.au/elise*

The Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

7. Readings and resources

Textbook:
Neuroscience: Exploring the Brain 4th edition
Mark F. Bear, Barry W. Connors, Michael A. Paradiso
Wolters Kluwer   ISBN:9780781778176
https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780781778176 (print)
(recommended for students continuing in neuroscience)

or

Neuroanatomy and Neuroscience at a Glance 5th edition
Roger A. Barker, Francesca Cicchetti, Emma S.J. Robinson
Wiley-Blackwell   EISBN:9781119168423
https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781119168416 (print)

Recommended reading:
Principles of Neural Science; Kandel, Koester, Mack, Siegelbaum; McGraw-Hill (6th edition)
https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781259642234 (print)

Medical Physiology; Boron & Boulpaep; Elsevier (3rd edition)
https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781455743773 (print)
https://unswbookshop.vitalsource.com/products/-v9781455733286 (digital)

Neuroscience; Purves, Augustine, Fitzpatrick et al. Oxford University Press (6th edition)

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[1] International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781605353807 (print)
https://unswbookshop.vitalsource.com/products/-v9781605357225 (digital)
(searchable online via NIH national Library of Medicine via UNSW Library)

The books are available from the UNSW Bookshop and hard copies are held by the UNSW library.

Further study:
UNSW has a broad range of subjects dealing with Neuroscience, and you can take a major in Neuroscience as part of the BSc or BScAdv. Talk to the Science Student Centre, who is the Program Authority for Neuroscience, if you would like more information on further study options.

8. Administrative matters

Student enquiries should be submitted via student portal https://portal.insight.unsw.edu.au/web-forms/

9. Additional support for students

- The Current Students Gateway: https://student.unsw.edu.au/

- Academic Skills and Support: https://student.unsw.edu.au/academic-skills

- *Student Wellbeing and Health* https://www.student.unsw.edu.au/wellbeing

- UNSW IT Service Centre: https://www.myit.unsw.edu.au/services/students

- *UNSW Student Life Hub:* https://student.unsw.edu.au/hub#main-content

- *Student Support and Development:* https://student.unsw.edu.au/support

- *IT, eLearning and Apps:* https://student.unsw.edu.au/elearning

- *Student Support and Success Advisors:* https://student.unsw.edu.au/advisors

- *Equitable Learning Services (Formerly Disability Support Unit):* https://student.unsw.edu.au/els

- *Transitioning to Online Learning* https://www.covid19studyonline.unsw.edu.au/

- *Guide to Online Study* https://student.unsw.edu.au/online-study

- *School of Medical Sciences – Advice for students* https://medicalsciences.med.unsw.edu.au/students/undergraduate/advice-students