



Faculty of Medicine & Faculty of
Science

School of Medical Sciences
& School of Psychology

NEUR2201

Neuroscience Fundamentals

COURSE OUTLINE

SEMESTER 2, 2017

CRICOS Provider Code 00098G

WELCOME

Neuroscience Fundamentals is a multi-disciplinary course that brings together neuroscientists from across UNSW to deliver a course that is broad-reaching, up-to-date, and on a subject that is one of the last great frontiers of knowledge.

The course is structured into five fortnight-long modules, each taught by members of two or more different neuroscientific disciplines. Each module includes a hands-on lab, and typically concludes with a tutorial and short quiz. This format allows us to tackle some “big questions” in neuroscience. We will do our best to ensure that you find the course as exciting and fulfilling as we find our own engagement in the research, study and practice of neuroscience.

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Please read this manual/outline in conjunction with the following pages on the [School of Medical Sciences website](#):

- [Advice for Students](#)
- [Learning Resources](#)

(or see "STUDENTS" tab at medicalsciences.med.unsw.edu.au)

COURSE STAFF

Course Convenors

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Professor Margaret Morris		Pharmacology
Professor Peter Schofield		NeuRA
Professor Ernie Somerville		Neurology

Consultations

A/Profs Moorhouse & Lin share responsibility for academic and administrative matters regarding the course. Please approach them for any questions or problems concerning the course. It is best to arrange an appointment in advance by email, copying both into the email.

The Science Student Office (BSB Student Office) is available to help with problems with enrolment and scheduling, and should be the first point of contact for administrative problems. Their office is on Level G, Biosciences. Contact details are ph: 9385 2464; Email: SOMSenquiries@unsw.edu.au

COURSE INFORMATION

Course Structure and Teaching Strategies

Overview: Neuroscience Fundamentals (NEUR2201) is a stage two course worth six units of credit (6 UOC) administered by the School of Medical Sciences. It is delivered across 12 teaching weeks in session 2, with six contact hours per week. NEUR2201 can be undertaken upon successful completion of 12 units of background courses in BABS, BIOS or PSYCH, with many students completing the useful background courses: ANAT2511 BIOC2101 PHSL2101 and/or PSYC2081. The course 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. In 2017, NEUR2201 will commence in week 1, from Wed 26th July, and finish in Week 12, 19th October

Contact hours: This course structure is

- two lectures per week
- one or two 3-hour practical class(es) per fortnight
- up to one 2-3 hr tutorial class per fortnight comprising a variety of activities
- ongoing 15 min in class assessments, typically in each fortnightly lab class

Non-contact hours: Students are strongly recommended to allocate at least six hours per week for additional self-directed study, which will include revision for assessments and working on the group project task and the NeuroQuiz task.

Class Times and Locations: (please consult the Course Schedule on Moodle)

Lectures are one hour long, from 3pm on Mondays and from 10 am on Wednesdays, both in Mathews Lecture Theatre D.

Tutorials which generally run every second week are held in two different locations: Mathews Rm 310 from 9am, or from 1pm in room G17 in the Tyree Energy Technologies Building. You will enrol in either the morning or afternoon class, and should keep in that same class throughout the semester.

Practical classes which generally run in the alternate weeks to the tutorials and are usually held in Wallace Wurth 120, except for the first week where they will be in WW101E.

Course schedule

The current course timetable is on the NEUR2201 Moodle website. Please check the schedule and summary of each Module for any updates.

Requirements for Practical Classes

Practicals involving the use of animal or human specimens are a privilege, and must be treated with respect and professionalism. Students are expected to adhere to the [Australian code of practice for the care and use of animals for scientific purposes](#), and the [National Statement of Ethical Conduct in Human Research](#)

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 are compulsory in all practical classes.** Punctual arrival is expected, and mobile phones must be switched off before entering the class. Practical classes that involve student participation may require the subject to sign a witnessed, informed consent form.

For more details see [Advice for Students-Practical Classes](#)

APPROACH TO LEARNING AND TEACHING

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. The practical classes assist in the development of research and analytical skills, and allow more interactive learning. 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.

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

Aims of the Course

Students will gain an understanding of the modern neuroscience.

Specifically...

- Students will develop an understanding of the cross-disciplinary field of neuroscience by study of major neuroscience topics at a scale ranging from molecular through synaptic and cellular processes up to the level of the whole animal, including human behaviour.
- Students will develop an insight into the methods by which problems in neuroscience are investigated as well as the technical limitations behind many of the currently unresolved issues.

Student Learning Outcomes

By the end of this course students are expected to have gained:

- a demonstrable knowledge of the scope of neuroscience, and detailed knowledge in some areas relating cellular properties to the response of whole organs and animals
- experience in applying basic biological and psychological principles to resolve questions related to brain and behaviour.
- experience and expertise in locating and appraising information related to neuroscience and succinctly presenting conclusions related to these enquiries.
- experience and expertise in critical enquiry by contributing to scientific discussion.
- by practical experience and critical review, an appreciation of the relationship between the experimental techniques that provide neuroscientific data, and the constraints on interpretation that the techniques impose.

ASSESSMENT

Assessment tasks

- | | |
|--|------------|
| 1) Ongoing on-line assessment quizzes, comprising: | |
| a) End of fortnightly module quizzes (best 4 out of 5) | 20% |
| b) On-line multiple-choice bank (NeuroQuiz) | 5% |
| 2) Short answer practice & peer marking | 5% |
| 3) Group project <i>Neuroscience in the Media</i> | 25% |
| 4) Final exam | 45% |

1) a) Each fortnight-long module has a short quiz at the end, run during the practical class the following week. These quizzes are done online, and take about 15 minutes to complete. A variety of forms of assessment are used in the quizzes including labelling figures and filling gaps in text. These quizzes provide immediate feedback on your progress, and review content that will be covered in the short-answer questions of the final exam. Your best four results will be counted.

b) An additional 5% is allocated for your participation in the NeuroQuiz activity. This Reading Game activity is an online question and answer activity in which you are required to think up and post multiple choice questions, as well as answer questions posted by other students. The quiz is accessed from Moodle, under the assessments tab, and a description of how to play is found within the Introduction to the Reading Game. Assessment marks are gained for reaching a certain points level by the Monday following each Module. You will be advised by Andrew & Cindy of the particular points level to be achieved in the week prior to this.

2) To give you some experience with the written question format of the exam we will have an in-class assessment in week 7. This will be peer-marked using a provided marking scheme, as well as being marked by Andrew and Cindy. This exam consists of two short answer Qs from Module 1 and 2. 50% of marks are allocated for your answer, and 50% of marks allocated for your peer assessment (how close your score is to the convenors, and the quality of your feedback). Papers with the peer feedback will be returned in the tutorial in week 9.

3) The group project is explained in more detail on page 9 of this course outline.

4) The final exam is 2 hours long, and consists of thirty multiple choice questions, and five short answer questions (one per topic) of which you are required to answer four. Some of the best MCQs from the NeuroQuiz will be used as MCQs in the final exam. The short answer Qs are similar in format to the practice exams.

CONTINUAL COURSE IMPROVEMENT (My Experience)

Feedback from students provides critical guidance for the continual development and improvement of this course. Student feedback comes primarily in the form of comments in My Experience (CATEI prior to 2016) and from the student reps. Feedback has again informed some changes in 2017. You are again invited to provide online anonymous course feedback via Moodle, via comments to the student reps, and via the end-of-session My Experience evaluation forms.

The course assessment in 2016 revealed positive feedback with 97% of students stating they agree with the statement, "Overall I was satisfied with the quality of the course". Three changes that were trialled in 2016 (Assigning group members; including a practice exam with peer review, and introducing the NeuroQuiz) have been maintained in 2017 based on good feedback.

Here are some sample comments from 2016:

1. Best features:

"loved this course! I found all the topics extremely interesting! All the assessment were appropriately spread out over the semester, I felt like I was never behind the course because the assessments required me to continually be up to date"

"liked neuromaster quiz thing, very helpful for consolidating knowledge."

"It's very interesting, there's a lot of information but it's linked to real world applications quite well. The labs have been great as well, lots of different activities that are each individually interesting."

"Despite being tested so often, I felt like it helped me get a grip of the knowledge required for the final exam."

"Practicals were very hands on and interesting :)"

2. Course could be Improved by:

"The tutorials were mostly looking at the lab data, which was interesting, but it didn't feel structured."

"Formatting on the wiki page" & "Including a tute on how to use the wiki system"

"Drop Psychophysiology and spend more time on the actual neuroscience fundamentals of the first couple of weeks. Drop the tutorials as they weren't imparting valuable information and there was very little interaction."

"The assessment we had in the first few weeks of semester was during a lecture slot...it would be better to have it during a lab / tutorial because many students work when the lectures are on."

In response to feedback, and to accommodate different staff being involved in the course, the following changes have been made:

1. An additional learning activity has been introduced to provide guidance in the use of the Wiki page for the group project
2. The practice exam has been timetabled into a lab / tute slot in response to feedback.
3. Parts of the Psychophysiology module are replaced with a module on Clinical Neurophysiology.
3. Some tutorials have been dropped and replaced with a prac and other learning activities
4. A summary of each Module will be released on Moodle 1 week prior to the start of the module.

TEXTBOOKS AND READING LIST

Textbook:

Neuroscience: Exploring the Brain 3rd edition
Mark F. Bear, Barry W. Connors, Michael A. Paradiso
Lippincott Williams & Wilkins ISBN:0781760038
(recommended for students continuing in neuroscience)

or

Neuroanatomy and Neuroscience at a Glance 4th edition
Roger A. Barker, Francesca Cicchetti
Wiley-Blackwell ISBN:9780470657683

Recommended reading:

Principles of Neural Science; Kandel, Schwartz, Jessell, Siegelbaum & Hudspeth; McGraw-Hill

Medical Physiology, a cellular and molecular approach; Boron & Boulpaep; Saunderson

Neuroscience; Purves, Augustine, Fitzpatrick et al. Sinauer

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

ADMINISTRATIVE MATTERS

Special Consideration

Please see [UNSW-Special Consideration](#) and [Student Advice-Special Consideration](#)

If you unavoidably miss assessment tasks for this course you must lodge an application with UNSW Student Central for special consideration within 3 days of the assessment.

If your request for consideration is granted, a supplemental assessment may be organised, or increased weighting may be applied to completed assessments. If you miss a progress Quiz your mark will be based on quizzes already completed (using a ranking system). If you miss the final exam, a supplementary exam (to be held between the 4th & 8th of December 2017) may be granted.

Official Communication

All communicate will be via your official UNSW email please see [Advice for Student-Official Communication](#) for more details.

Appeal Procedures

Details can be found at [Student-Advice-Reviews and Appeals](#)

Attendance Requirements

For details on the Policy on Class Attendance and Absence see [Advice for Students](#) and the [Policy on Class Attendance and Absence](#). Guidelines on extra-curricular activities affecting attendance can be found on the School of Medical sciences Website.

<http://medicallsciences.med.unsw.edu.au/sites/default/files/Extra-curricularActivitiesSOMS.pdf>

Attendance at practical classes and tutorials is compulsory, and may be recorded in the class roll at the start of each class. Students who miss practical or tutorial classes due to illness or for other reasons, must submit a copy of medical certificates or other acceptable documentation via the Online Services in myUNSW. The application should be lodged no more than three days after an absence.

Student Support Services

Details can be found at [Student Advice-Student support services](#).

Academic Integrity and Plagiarism

The [UNSW Student Code](#) outlines the standard of conduct expected of students with respect to their academic integrity and plagiarism.

More details of what constitutes plagiarism can be found [here](#)

Other Administrative Information

The following page provides general student information

<http://medicallsciences.med.unsw.edu.au/students/undergraduate/advice-students>

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 Dr Vickery, who is the Program Authority for Neuroscience, if you would like more information on further study options. An information session on Stage 3 Neuroscience courses will be held during the Wednesday lecture slot in week 10.

Neuroscience in the Media WIKI ASSESSMENT TASK

<p>Introduction:</p>	<p>You are required to find an interesting item, analyse the neuroscience presented, and also analyse the intent and effectiveness of the media item.</p> <p>This is a great chance to explore an area of neuroscience that has always intrigued you or perhaps a neuroscience myth that has annoyed you.</p> <p>This activity will develop your skills in critical analysis, self-directed learning, and team-work.</p>
<p>Requirement:</p>	<p>You will be assigned to work in a group of four students and should firstly identify a single online media item (such as a YouTube video, advertisement, or newspaper article) in the area of neuroscience. As a group you will prepare a wiki page detailing the neuroscientific context and evaluating the quality of information in the media item. As an individual you will provide editorial review to another group's project and provide feedback on your group members.</p>
<p>Contribution to assessment:</p>	<p>The group project will contribute 25% to your final mark, with a marks breakdown as:</p> <p>14% for the group project, as a common mark to all group members.</p> <p>3% for the project review that you write as an individual for one other group.</p> <p>4% for your individual participation in the group, assessed by Andrew, Cindy and/or Dennis based on your editing and comments in the wiki (quality, not quantity!); and also by your team mates and yourself.</p> <p>4% a common mark for the group presentation, assessed by Andrew & Cindy and/or Dennis</p>
<p>Stages of the Project & Due dates:</p>	<p>The project has several stages, described further below</p> <ol style="list-style-type: none"> 1. You must meet with your group, and submit your topic and work plan in the wiki by Monday, August 7 at 12 midday (week 3). 2. You must have a draft of the project ready by Monday, September 4 by 9pm (week 7). 3. You must provide review comments on your allocated project by Monday, September 18 at 12 midday (week 9). 4. The final project must be submitted by Tuesday, October 3rd at 5 pm (week 10) 5. You must do a group presentation of the Wiki Content on Thursday, October 5 in your allocated lab (week 10). <p>Failure to meet a deadline will incur a penalty of 5% per day. Projects can be submitted any time before the deadline.</p> <p>All work will be done within the OU wiki in Moodle. The wiki page will have detailed instructions, and links to good examples from previous years. Within the constraints of the site, you have freedom over the layout your project.</p>

<p>1. Topic Choice and Work Plan :</p>	<p>Topic choice is indicated by creating a new wiki page that contains</p> <ul style="list-style-type: none"> • the topic title and the group number in the title • the names and student numbers of the group members • a link to the selected media item • a work plan covering the division of labour and deadlines • a labelled photo as evidence of a face-to-face planning meeting. • The media item can be text, audio, video or whatever, but must not run more than 15 minutes for audio/video or be longer than 1000 words for text. <p>Your topic will be reviewed and you will be approved to continue or modify your topic and plan by Andrew, Cindy and/or Dennis by the following Monday</p>
<p>2. Project draft</p>	<p>This is the state of your wiki page at Monday 4th September 9pm. It should be reasonably complete to enable you to receive good feedback from your peers to improve the final submission.</p>
<p>3. Review Comments</p>	<p>You will be assigned a group to review by Cindy and/or Andrew. The comments should be made in a separate page, linked at the bottom of the page you are reviewing.</p> <p>Clearly label your comments page as “Reviewer comments on draft project by <your name>”. Do not edit or delete the page content, other than to add the link to your review.</p> <p>Feedback should be in the following format:</p> <ol style="list-style-type: none"> 1. strong points 2. weak points 3. general suggestions for improvement (e.g. logic, complexity, content, figures) 4. specific suggestions for improvement (e.g. typos, grammar, labels) <p>A short paragraph or some dot points is required on each of these four areas. Try and be constructive and insightful, and comment on the neuroscience, not just on the grammar and layout.</p> <p>You will be marked by Cindy, Andrew and/or Dennis based on the:</p> <ul style="list-style-type: none"> • timeliness • depth • quality • constructiveness <p>of the advice that you offer for the topic under review.</p>
<p>4. Final Project</p>	<p>This is the state of your wiki page at 5pm October 3rd. It should include a section indicating the alterations made in response to the reviewers' feedback.</p> <p>The Wiki should be up a maximum of 2500 words, excluding tables, figures and legends, references, and the appendix.</p> <p>Your Wiki should:</p> <ul style="list-style-type: none"> • Introduce the online media item that you have chosen; • Explain the neuroscientific context of the item; • Analyse the quality of information in the media item; • Include an appendix that details the search strategy by which you identified the supporting evidence you used in your analysis, and also spells out and justifies changes made to the draft in response to the reviewers' feedback. <p>1. The Introduction should briefly describe the nature of the media item that you have chosen (clinical case, research data, advertisement, documentary excerpt etc) and then explain why it is of interest to you. You should provide a road-map of the areas you will be discussing or a list of questions that you will address.</p>

2. The neuroscientific context is where you provide the background to appreciate the media item by summarising the state of current knowledge relevant to the item. Sometimes it may be necessary to focus on only one aspect of a media item in order to stay within the word limit. You can include brief discussions on any ethical or social impacts that you feel are appropriate.

3. In the analysis section you should identify the target audience of the media item, determine whether the information is pitched appropriately and in an unbiased manner, and then finally assess the quality of information in the item, especially as to whether it is in accord with accepted current understanding in neuroscience.

4. The appendix should explain your search and selection strategy for all resources that you used. The mark for this section will in part reflect the range and quality of your sources, and how well you managed the referencing. It should also summarise the reviewers' comments and detail how these concerns were addressed or dismissed.

Introduction: 10%; Neuroscientific Context: 60%; Analysis: 20%; Appendix: 10%.

In all aspects we are looking for clarity of thinking (logical consistency, thoroughness) and clarity of expression (clear sequencing and presentation of information).

The marking sheet used has the following points, so make sure you address them!

Introduction

- choose an interesting and appropriate media item, and provides a good rationale for studying the item.
- Provides a good framework for the subsequent content

Neuroscientific Context

- identify the key aspects of the media item
- provide a concise and up-to-date summary of the neuroscience
- show evidence of independent research, with appropriate referencing.
- Describes the data/relevant experiments from at least one primary research article, including some description of how this experiment was done

Analysis

- demonstrate understanding of the intended purpose
- identify the target audience, and determine if the item is pitched appropriately (including if and how simplifications may affect the veracity of the message)
- is the item presented in an unbiased manner?

Appendix

- describe the search strategies employed and how the sources were evaluated
- summarise the reviewers' comments and explain how these concerns were addressed

In the **Neuroscientific Context**, you may limit the scope to only one or two areas of those addressed in your media item if it covers a broad range of topic. We would prefer a deeper treatment of one area than a superficial overview of many areas.

Your reference list, and in-text citations should use the APA format

(<http://web.med.unsw.edu.au/infoskills/cite3.htm> and

<https://student.unsw.edu.au/american-psychological-association-apa-referencing-system>). You must also reference all figures that you use in your wiki article.

A nice layout, and cross-linking to other pages in this wiki is encouraged.

5. Group presentation

	<p>The format of the presentation will be a 10-12 minute talk (using PowerPoint or some other format) that is followed by 1 or 2 questions (3-5 minutes). The group presentation should follow the same format as the actual Wiki, with an Introduction, Neuroscientific context and analysis section. At least one experiment contributing to the Neuroscientific context should be described. Each team member should contribute to the presentation. As time is limited, the group should provide an outline of the main points raised in the Wiki report. Presentations should also be clear and concise, and marks will be awarded on</p> <ul style="list-style-type: none"> • Presentation (clarity of slides and presentation) • Group participation and co-ordination • Neuroscientific content (accuracy and clarity) • Explanation of the experimental data • Ability to convey one or two major points to teach your peers about the science
<p>6. Group participation mark</p>	<p>All members of the group are required to demonstrate a minimum level of contribution to the project. The minimum level of participation from each student is</p> <ul style="list-style-type: none"> • editing the wiki on at least four occasions • editing the wiki over more than a one-week period • rating yourself and your team members for contributions to the project. <p>The suggested structure for your team is to have three members tackle the neuroscientific context, and two students tackle the media analysis and introduction, with all members contributing to the appendix and final editing. Working in pairs or small sub-groups on sections has generally produced better results than allocating one person per section (or sub-section).</p> <p>The allocation of member tasks should be agreed on by all the team. This should be documented in the work plan, which can be modulated (by agreement) as the Wiki progresses.</p> <p>You are required to rate your own and the other group members contributions using a form that we will make available after the wiki is submitted.</p> <p>The mark from the above objective components will be combined with the peer assessment to give a mark out of 4 for teamwork that counts towards your final course grade.</p>
<p>Tutorial</p>	<p>An explanation of the group Wiki will occur in Week 1, during the 1st tutorial session</p> <p>Groups will be assigned during this session and posted on Moodle. It is recommended you use this session to familiarize yourself with the requirements of the project and on how to set up and format the Wiki page</p>