



FACULTY OF MEDICINE & FACULTY OF SCIENCE
SCHOOL OF MEDICAL SCIENCES & SCHOOL OF PSYCHOLOGY

NEUROSCIENCE FUNDAMENTALS

NEUR2201

SESSION 2, 2012

*An introductory multi-disciplinary course in neuroscience delivered by
Anatomy, Health & Exercise Science, Physiology, Pharmacology, Psychology*

COURSE OUTLINE



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 six fortnight long modules, each taught by members of at least two different neuroscientific disciplines. Each module includes a hands-on lab, and 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 you find the course as exciting and fulfilling as we find the study of neuroscience.

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COURSE STAFF

Course Co-ordinator

Course Co-ordinator Dr Richard Vickery
 room 308D, third floor Wallace Wurth building
 phone 9385 1676
 e-mail Richard.Vickery@unsw.edu.au

Course Examiner Dr Paul Bertrand
 room 302, third floor Wallace Wurth building
 phone 9385 3947
 e-mail P.Bertrand@unsw.edu.au

Consultations

Dr Vickery is responsible for all academic and administrative matters regarding the course. Students should feel free to approach him for any questions or problem concerning the course. It is best to arrange an appointment in advance by email. Dr Vickery is usually in on Monday, Wednesday and Friday. In Dr Vickery's absence, urgent enquiries can be directed to Dr Bertrand.

Other information of an administrative nature may also be obtained from the Combined Schools Science Office, Ground Floor, BioSciences building.

Other Teaching Staff

Dr Ehsan Arabzadeh	ehsan@psy.unsw.edu.au	Psychology
Dr Pascal Carrive	p.carrive@unsw.edu.au	Anatomy
Dr Thomas Fath	t.fath@unsw.edu.au	Anatomy
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Dr Jacqueline Rushby	j.rushby@unsw.edu.au	Psychology
Prof. Peter Schofield		NeuRA
Prof. Ernie Somerville		Neurology

COURSE INFORMATION

Course Structure and Teaching Strategies

Units of credit: This course is worth 6 units of credit.

Contact hours: This course structure is

- two lectures per week
- one 3 hour practical class per fortnight
- one 90 minute tutorial class per fortnight

Class Times and Locations:

The course runs on Monday, Tuesday, and Friday.

Lectures are 9-10 am on Monday in Mathews Lecture Theatre C, and 1-2 pm on Tuesday in the Biomedical Lecture Theatre E (Biomed E). The tutorials which run every second week are held in Mathews 310. Practical classes run from 9 - 12 noon on Fridays; their location is generally in Biosciences 329, but does vary week by week as they are hosted by the different Departments involved in this course. Check your timetable for details of each class' location.

Course schedule

The complete course timetable is included at the end of this course outline. Any updates to the timetable will be announced in lectures and on the NEUR2201 Blackboard website.

Blackboard (UNSW TELT)

This course will rely extensively on Blackboard for communication and resources. To access the course site, point your browser to: <http://lms-blackboard.telt.unsw.edu.au/> "Log on" to Blackboard using your z-pass, and then look for the course NEUR2201. You should have access to it if you are properly enrolled.

Via Blackboard you will be able to access lecture notes; these will be posted for all lectures, either before, or shortly after, each lecture. Students are strongly encouraged to attend the lectures in person, as these notes and the Lectopia recordings are provided primarily to assist students with disabilities and do not represent an appropriate way to take the course.

Notes for the practical classes will be posted on Blackboard prior to the class. You should read these notes, print them, and bring them to the class.

Blackboard forums are also available for students to discuss the course with each other and with the lecturers and tutors. In particular, specific forums allow lecturers to answer questions about the lecture material. There is also a forum in which students can provide anonymous feedback while the course is being conducted: this allows us to respond to any problems in a timely manner.

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 NH&MRC guidelines for ethics in animal and human studies (available at the course Blackboard site, or via <http://nhmrc.gov.au/publications/synopses/ea16syn.htm> & http://nhmrc.gov.au/publications/ethics/2007_humans/contents.htm).

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.

Attendance Requirements

Attendance at practical classes is compulsory, and may be recorded in the class roll on the day of the class. Satisfactory completion of the work set for each class is essential. Failure to attend practical classes and tutorials for other than documented medical or other serious reasons, or unsatisfactory performance, may result in an additional assessment or ineligibility to pass the course.

Medical Certificates

Students who miss practical classes or tutorial assessment due to illness or for other reasons must submit a copy of medical certificates or other acceptable documentation to the course co-ordinator. Certificates should be lodged no more than 7 days after an absence. The following details must be attached: Name, Course code, Date of the class, Name of class missed.

Official Communication by Email

All students in the course NEUR2201 are advised that e-mail is the official means by which UNSW will communicate with you. All e-mail messages will be sent to your official UNSW e-mail address (e.g. z1234567@student.unsw.edu.au) and, if you do not wish to use the University e-mail system, you must arrange for your official mail to be forwarded to your chosen address. The University recommends that you check your mail at least every other day. Facilities for checking e-mail are available in the School of Medical Sciences and in the University library. Further information and assistance is available from the Service Desk on 9385 1777. Free e-mail courses are run by the UNSW Library.

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". These guidelines may be viewed at: www.guidelinesonlearning.unsw.edu.au. The teaching of Neuroscience Fundamentals is based on the conception of neuroscience as a core field of knowledge to which many different disciplines contribute. The course is structured in 2-week modules covering topics that are both fundamental, but still active frontiers of investigation. Each topic will be 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 will be 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 will provide you with the concepts and theory essential for understanding neuroscience. The practical classes will assist you in the development of research and analytical skills. The practical classes will allow you to engage in more interactive learning than is possible in lectures. The tutorials will be a mix of case presentations, video material and informal discussion to help you explore the material in more depth.

Although the primary source of information for this course is the material delivered in lectures and

practical classes, 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

To 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 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

UNSW Graduate Attributes:

1. the skills involved in scholarly enquiry
2. an in-depth engagement with the relevant disciplinary knowledge in its interdisciplinary context
3. the capacity for analytical and critical thinking and for creative problem-solving
4. the ability to engage in independent and reflective learning
5. information literacy - the skills to appropriately locate, evaluate and use relevant information
6. the capacity for enterprise, initiative and creativity
7. an appreciation of, and respect for, diversity
8. a capacity to contribute to, and work within, the international community
9. the skills required for collaborative and multidisciplinary work
10. an appreciation of, and a responsiveness to, change
11. a respect for ethical practice and social responsibility
12. the skills of effective communication.

This course focuses on attributes 1-4; while attributes 5, 6, 9 and 12 are also specifically addressed.

Specific 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

- End of fortnightly module quizzes **25%**
- On-line multiple choice assessments **5%**
- Group project **25%**
- Final exam **45%**

Each fortnight-long module has a short quiz at the end, run in the tutorial slot. These quizzes are usually ~10 minutes duration. Online assessment is conducted through three sets of multiple choice questions (one per two modules). The group project is explained in more detail on pages 11-12 of this course outline.

Missed In-Course Assessment

If you unavoidably miss an assessment task you must inform the Course Co-ordinator immediately. You must supply adequate documentation (such as a medical certificate) to be considered for any supplementary assessment.

Missed Exams

If in any circumstances you unavoidably miss an examination, you must inform the Registrar and also contact the Course Co-ordinator immediately. Normally, if you miss an exam (without medical reasons) you will be given an absent fail. If you arrive late for an exam no time extension will be granted. It is your responsibility to check timetables and ensure that you arrive with sufficient time.

PLEASE NOTE that if you miss any examinations for medical reasons you must lodge a medical certificate within **3 DAYS** to UNSW Student Central, refer to studentlifelearning.unsw.edu.au/studentcentral/ for further details. Your request for consideration will be assessed and a deferred exam may be granted. You cannot assume you will be granted supplementary assessment. The deferred exam may include a significant oral element.

Special Consideration

If you believe that your performance in a course, either during session or in an examination, has been adversely affected by sickness or for any other reason, you should notify UNSW Student Central via studentlifelearning.unsw.edu.au/studentcentral/ and ask for special consideration in the determination of your results. Such requests should be made as soon as practicable after the problem occurs. **Applications made more than three days after an examination in a course will only be considered in exceptional circumstances.** Please refer to myUNSW for further details regarding special consideration.

ACADEMIC HONESTY AND PLAGIARISM

Students should be aware of UNSW's policy on academic and student misconduct: <https://my.unsw.edu.au/student/academiclife/assessment/AcademicMisconduct.html>

Student assignments may be submitted to the Turnitin plagiarism detection engine. In addition students should be familiar with the following:

Plagiarism is the presentation of the thoughts or work of another as one's own. Examples include:*

- *direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;*
- *paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;*
- *piecing together sections of the work of others into a new whole;*
- *presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and,*
- *claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†*

Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism. The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

Students are reminded of their Rights and Responsibilities in respect of plagiarism, as set out in the University Undergraduate and Postgraduate Handbooks, and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms. The Learning Centre website is the central University online resource for staff and student information on plagiarism and academic honesty. It can be located at: www.lc.unsw.edu.au/plagiarism

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- *correct referencing practices;*
- *paraphrasing, summarising, essay writing, and time management;*
- *appropriate use of, and attribution for, a range of materials including text, images and concepts.*

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

Student Support Services

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course co-ordinator prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Student Equity and Disabilities Unit (ph. 93854734). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

Student Rights and Responsibilities & Appeal Procedures

Refer to UNSW Student Gateway at myUNSW: www.student.unsw.edu.au

Grievance Resolution Officer

In case you have any problems or grievance about the course, you should try to resolve it with the Course Co-ordinator. If the grievance cannot be resolved in this way, you should contact the School of Medical Sciences Grievance Officer, Dr P.Pandey (9385 2483, P.Pandey@unsw.edu.au).

RESOURCES FOR STUDENTS

Textbook 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

Neuroscience at a Glance 3rd edition
Roger A. Barker, Stephen Barasi, Michael J. Neal
Blackwell
ISBN:1405111240

Recommended reading:

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

Medical Physiology, a cellular and molecular approach.
Boron & Boulpaep
Saunders

Neuroscience.
Purves, Augustine, Fitzpatrick et al.
Sinaur

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

CONTINUAL COURSE IMPROVEMENT

Feedback from students is one of the main ways of ensuring the continual development and improvement of this course. You are invited to provide online anonymous course feedback via Blackboard throughout the session to enable immediate response. The end-of-session Course and Teaching Evaluation and Improvement [CATEI] process of UNSW is another way in which student feedback is evaluated, and we ask your assistance in completing this survey at the appropriate time.

Part of the CATEI process is to communicate significant changes to the course to subsequent cohorts of students. The last CATEI course assessment was in 2011 and gave generally very positive feedback. Here are some sample comments:

I liked the range of topics we covered - they were quite varied and gave us a chance to see different aspects of neuroscience. I liked being [able to] try bits of physiology, pharmacology etc, having never done these subjects before. The different lecturers also kept the course fresh and interesting.

The fortnightly quizzes were good because they made me revise the course material regularly.

I enjoyed being able to use EEG, MEG and nerve conductance in the labs - that was fun. The trip to the museum of human disease was also good - I felt it made our neurotrauma module more relevant.

I particularly liked the MS tutorial. Everyone was drawn into her story and we all had something to take away from it.

The course has been modified in response to suggestions from 2011 as follows.

1. The project deadline has been moved back to give adequate time to complete this assessment
2. There is a more structured assessment of the teamwork component of the group project, and an individual component to the mark.
3. The tutorials have a more organised structure to make their goals clearer.

ADMINISTRATIVE INFORMATION

General Information

This course is a cross-Faculty course taught by the School of Medical Sciences and the School of Psychology. Administration is based in the Department of Physiology which is part of the School of Medical Sciences and is within the Faculty of Medicine. General inquiries can be made at the BSB Office, located on the Ground Floor of the BioSciences building (office hours are 9.00 am - 5:00pm). Professor Nick Hawkins is Head of the School of Medical Sciences and appointments may be made with him through his Administrative Assistant on 9385 8195.

Further Study

There is a broad range of level II and III subjects in the field of neuroscience offered by the disciplines contributing to this course that would be appropriate if you wish to undertake further study in neuroscience.

For guidance on suitable courses you may consult the Neuroscience study plan in Science or Advanced Science www.handbook.unsw.edu.au/undergraduate/plans/2012/NEURA13972.html. Further advice is available from the Course Co-ordinator, who is also the UNSW Program Authority for Neuroscience.

GROUP ONLINE PROJECT ASSESSMENT TASK

Requirement:	You will work in a group of four students to identify an 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.
Contribution to assessment:	The group online project assessment will contribute 25% to your final mark for the course. The mark break down is as follows: 15% for the group project, as a common mark to all group members. 5% for the editorial advice given to other group. 5% for group participation assessed by Dr Vickery based on your editing and comments in the wiki, and by your team mates.
Due date:	The project has several stages. 1. You must form your group, and submit your topic and work plan in the wiki by Monday, August 6 at 10 am. 2. You must have a draft of the project ready by Monday, September 10 at 10 am. 3. You must provide review comments on your allocated project by Monday, September 17 at 10 am. 4. The final project must be submitted by Monday, September 24 at 10 am. Failure to meet a deadline will incur a penalty of 5% per day. Projects can be submitted any time before the deadline.
How to submit:	All work will be done within wikispaces http://neur2201.unsw.wikispaces.net/ . You will receive an email invitation to join the wiki in the first week of classes. Topic choice is indicated by creating a new wiki page that contains <ul style="list-style-type: none"> • the Topic Title • the Names and Student Numbers of group members • a Link to the media item on the page. A work plan including division of labour, deadlines, and evidence of a face-to-face planning meeting (minutes, or a photo) should be posted in the discussion page linked to the wiki content page. Project draft will be the state of your wiki page at the due date. Within the constraints of the site, you have freedom over how to lay out your project. Review Comments should be made through the discussion page linked to the wiki content. You will be assigned a group to review by Dr Vickery. Post your comments by the due date, and label them clearly as "Reviewer comments on draft project by <your name>" Final Project will be the state of your wiki page at the due date. It should include a section indicating the alterations made in response to the reviewers' feedback. Contact Richard.Vickery@unsw.edu.au if you have any problems.
Word limit:	2500 words, excluding tables, figures and legends, references, and appendix.
Format:	You must create a wiki entry at http://neur2201.unsw.wikispaces.net/ that: <ol style="list-style-type: none"> 1. introduces the online media item that you have chosen; 2. explains the neuroscientific context of the item; 3. analyses the quality of information in the media item; 4. includes an appendix that details the search strategy by which you identified

Week	Lecture: Mon 9-10	Lecture: Tue 1-2	Lab / Tutorial: Fri 9-12
Brain Maps			23/06/12
week 2 23 / 7	Neural coding <i>Ehsan Arabzadeh</i> Mathews C - 23/7 0900	Sensory transduction <i>Richard Vickery</i> Biomed E - 24/7 1300	Lab: Brain maps and cortical plasticity <i>Ehsan Arabzadeh & Richard Vickery</i> BioSciences 329 - 27/7 0900
week 3 30 / 7	Cortical maps <i>Richard Vickery</i> Mathews C - 30/7 0900	Modifying maps <i>Ehsan Arabzadeh</i> Biomed E - 31/7 1300	Tute: Malleable maps and amputees <i>Ehsan Arabzadeh & Richard Vickery</i> Mathews 310 - 3/8 0900
Epilepsy			
week 4 6 / 8	Introduction to brain electricity <i>Eric Han</i> Mathews C - 6/8 0900	Genetics of epilepsy <i>Peter Schofield</i> Biomed E - 7/8 1300	Lab: EEG recording and seizure activity <i>Andrew Moorhouse & Eric Han</i> BioSciences 329 - 10/8 0900
week 5 13 / 8	Current and novel drug treatments <i>Margaret Morris</i> Mathews C - 13/8 0900	Overview and clinical perspectives <i>Ernie Somerville</i> Biomed E - 14/8 1300	Tute: Cellular and molecular basis of epilepsy <i>Andrew Moorhouse & Eric Han</i> Mathews 310 - 17/8 0900
Stress			
week 6 20 / 8	Psychology of stress <i>Gavan McNally</i> Mathews C - 20/8 0900	Central nervous system and stress <i>Paul Bertrand</i> Biomed E - 21/8 1300	Lab: Stress in measured in humans, rats and organs <i>Paul Bertrand & Lu Liu</i> BioSciences 329 - 24/8 0900
week 7 27 / 8	Peripheral nervous system and stress <i>Paul Bertrand</i> Mathews C - 27/8 0900	How to treat stress <i>Lu Liu</i> Biomed E - 28/8 1300	Tute: Systems and management <i>Paul Bertrand & Lu Liu</i> Mathews 310 - 31/8 0900
3 / 9	mid -	session	break
Neurotrauma			
week 8 project draft 10 / 9	CNS anatomy <i>Thomas Fath</i> Mathews C - 10/9 0900	Neurotrauma types <i>Thomas Fath</i> Biomed E - 11/9 1300	Lab: Gross anatomy, museum specimens, histology. <i>Thomas Fath & Nicole Jones</i> WW 109/110 & 101W - 14/9 0900
week 9 17 / 9	Vascular & hypoxic neurotrauma <i>Nicole Jones</i> Mathews C - 17/9 0900	Mechanical neurotrauma <i>Thomas Fath</i> Biomed E - 18/9 1300	Tute: Neuronal death and recovery <i>Thomas Fath & Nicole Jones</i> Mathews 310 - 21/9 0900
Psychophysiology of Cognitive Disorders			
week 10 project final 24 / 9	Axonal conduction <i>Richard Vickery</i> Mathews C - 24/9 0900	Signs and Symptoms of MS <i>Arun Krishnan</i> Biomed E - 25/9 1300	Recording from human axons: carpal tunnel lab <i>Arun Krishnan & Richard Vickery</i> BioSciences 329 - 28/9 0900
week 11 1 / 10	<i>Labour Day Holiday (lecture shifted to Friday)</i>	Measuring nerve conduction <i>Cindy Lin</i> Biomed E - 2/10 1300	Treating MS lecture <i>Arun Krishnan</i> Mathews 310 - 5/10 0900 Tute: Discussion with a MS patient <i>Cindy Lin</i> Mathews 310 - 5/10 1000
Psychophysiology of Cognitive Disorders			
week 12 8 / 10	Real-time neural measurements <i>Richard Vickery</i> Mathews C - 8/10 0900	Applied psychophysiology <i>Jacqueline Rushby</i> Biomed E - 9/10 1300	Lab: The nervous system and the measurement of its electrical activity <i>Jacqueline Rushby</i> BioSciences 329 - 12/10 0900
week 13 15 / 10	Clinical applications of physiological measurements <i>Jacqueline Rushby</i> Mathews C - 15/10 0900	Clinical applications of neuro/biofeedback <i>Jacqueline Rushby</i> Biomed E - 16/10 1300	Tute: Detection of Deception <i>Jacqueline Rushby</i> Mathews 310 - 19/10 0900