



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

NEUROSCIENCE FUNDAMENTALS

NEUR2201

SESSION 2, 2009

*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 launched in 2008. We are very excited about this course which 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 2549
 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 School of Medical Sciences Office, Ground Floor, Wallace Wurth building.

Other Teaching Staff

Dr Ehsan Arabzadeh	ehsan@psy.unsw.edu.au	Psychology
Dr Ben Barry	ben.barry@unsw.edu.au	Health & Exercise
Dr Pascal Carrive	p.carrive@unsw.edu.au	Anatomy
Dr Cathie Gorrie	c.gorrie@unsw.edu.au	Anatomy
Dr Ross Grant	r.grant@unsw.edu.au	Pharmacology
Dr Nicole Jones	n.jones@unsw.edu.au	Pharmacology
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Prof. Peter Schofield		Biotechnology
Prof. Ernie Somerville		Neurology
Dr Branka Spehar	b.spehar@unsw.edu.au	Psychology
Dr Liz Tancred	e.tancred@unsw.edu.au	Anatomy

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 1-2 hour tutorial class per fortnight

Class Times and Locations:

The course runs on Tuesday, Wednesday and Thursday.

Lectures run from 12-1pm on Tuesday in Central Lecture Block Theatre 5 (CLB5) and 11-12 on Wednesday in BioMedical Lecture Theatre F (corner of BioSciences and Wallace Wurth Buildings).

The tutorials which run every second week are held in Mathews room 102.

Practical classes run from 10-1pm on Thursdays. Their location varies week by week as they are hosted by the different Departments involved in this course. Check your timetable for details of each class' location.

Tutorial Class assignment:

Some tutorial classes may be run as two successive classes with half the student group at each time: this will facilitate a better small group experience. For other tutorials the whole group will stay together for the session. When the group is broken in two, it will be done alphabetically and you will be advised at the start of the fortnight block whether you have the early (10am) or later (12.30pm) tutorial slot.

Course schedule

The course timetable is included at the end of this section. Any updates to the timetable will be announced in lectures and on WebCT Vista.

WebCT Vista

This course will rely extensively on WebCT Vista for communication and resources. To access the course site, point your browser to: <http://vista.elearning.unsw.edu.au/>

Click on "UNSW Online Courses" at the left, then click the "Log on" button and enter your Unipass (z<student-number> and your password). After logging on to WebCT, look for the course NEUR2201. You should have access to it if you are properly enrolled.

Via WebCT you will be able to access lecture notes, posted before or shortly after each lecture. Students are strongly encouraged to attend the lectures in person instead of relying on these notes.

Notes for the practical classes will be posted on WebCT at least 2 days prior to the class. You should read these notes, print them and bring them to the class.

WebCT 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 completely anonymous feedback on the course while the course is being conducted: please use it wisely.

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 WebCT 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 involving your participation as a subject may require you to sign a witnessed, informed consent form.

Attendance Requirements

Attendance at practical classes is compulsory, and must be recorded in the class roll on the day of the class. It is your responsibility to ensure that the demonstrator records your attendance. Satisfactory completion of the work set for each class is essential. It should be noted that non-attendance for other than documented medical or other serious reasons, or unsatisfactory performance, for more than 1 practical class during the session may result in an additional practical assessment exam or ineligibility to pass the course.

Medical Certificates

Students who miss practical classes 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 now 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. This way the scope and range of approaches in tackling major issues in neuroscience will be made clear. Neuroscience is primarily as 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 are relatively small and 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.
- Students will develop an appreciation of some current unresolved issues in the rapidly-developing field of neuroscience research.

Student Learning Outcomes

UNSW Learning outcomes:

UNSW aims to provide an environment that fosters students achieving the following generic 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.

Not every course addresses all these attributes evenly. Neuroscience Fundamentals is weighted most heavily towards attributes 1-4; 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 topic quizzes | 15% |
| • On-line multiple choice assessments | 5% |
| • Essay | 15% |
| • Group project | 15% |
| • Final exam | 50% |

Each module has a short quiz at the end of the fortnight, run in the tutorial slot. Online assessment is conducted through three sets of multiple choice questions (one per two modules). Written assessment tasks must be submitted through WebCT Vista using Turnitin. A penalty of 5% per day will apply for late submissions.

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 with New South Q within **3 DAYS** (refer to UNSW Student Gateway @ www.student.unsw.edu.au 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 NewSouth Q 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/AcademicMisconductStudentMisconduct.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, formulae 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 EADU 9385 4734. 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 Organizer. 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 about this course is one of the main ways of ensuring the continual development and improvement of this course. We invite students to provide online anonymous course evaluation to academic staff via WebCT Vista throughout the session to enable immediate feedback. 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 for 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. Last year we used anonymous user online feedback forums, and conducted face-to-face consultation with the students. Feedback was generally very positive. Some specific suggestions were made and these have been implemented as follows.

1. The essay deadline should be brought forward. Last year the deadline was October 10, the students had many other assignments due around the same time, and they felt that they would prefer to submit the essay earlier. This year the deadline is September 25, though you may of course submit it earlier.
2. The end of topic assessments were very popular, but needed more standardisation as they varied from a worksheet plus quiz down to 2 MCQs. This year each topic will have about 10 minutes of assessment, usually in the form of 2 five minute short answer questions.
3. The students wanted some group work component, possibly done online. This idea has been adopted, and replaces the mid-session exam in terms of assessment weighting. Students will work in groups of 4 to identify an online neuroscience resource (such as a YouTube video) and then prepare a web page detailing the neuroscientific context of their media example and evaluating its veracity, with an appendix showing the research and search strategies they utilised to obtain their information and locate the resource.

ADMINISTRATIVE INFORMATION

General Information

This course is a cross-Faculty course taught 2/3 by the School of Medical Sciences and 1/3 by 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 School of Medical Sciences Reception, located on the Ground Floor of the Wallace Wurth (office hours are 9.00 am - 5:00pm).

Professor Nick Hawkins is Head of the School of Medical Sciences and appointments may be made 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 which courses would be most suitable you may consult the Neuroscience study plan in Advanced Science as most of these courses are also open to students outside Advanced Science <http://www.handbook.unsw.edu.au/undergraduate/plans/2009/NEURA13972.html>. Further advice is available from any staff member teaching on this course, or by contacting the Course Co-ordinator.

Week	Lecture: Tue 12-1	Lecture: Wed 11-12	Lab/Tute: Thu 10-1
Brain Maps			
week 2 27 / 7	Neural coding <i>Ehsan Arabzadeh</i> CLB 5	Sensory transduction <i>Richard Vickery</i> Biomed F	Lab: Brain maps and cortical plasticity <i>Ehsan Arabzadeh & Richard Vickery</i> Mat 209
week 3 3 / 8	Cortical maps <i>Richard Vickery</i> CLB 5	Modifying maps <i>Ehsan Arabzadeh</i> Biomed F	Tute: Malleable maps and amputees <i>Ehsan Arabzadeh & Richard Vickery</i> Mat 107
Stress			
week 4 10 / 8	Psychology of Stress <i>Gavan MacNally</i> CLB 5	Central nervous system and stress <i>Pascal Carrive</i> Biomed F	Lab: Stress in measured in humans, rats and organs <i>Pascal Carrive, Paul Bertrand & Lulu Liu</i> WW M210
week 5 17 / 8	Peripheral nervous system and stress <i>P. Bertrand & L. Liu</i> CLB 5	How to treat stress <i>Lulu Liu & Paul Bertrand</i> Biomed F	Tute: <i>Paul Bertrand & Lulu Liu</i> Mat 107
Epilepsy			
week 6 24 / 8	Intro to brain electricity <i>Trevor Lewis</i> CLB 5	Overview and clinical perspectives <i>Ernie Somerville</i> Biomed F	Lab: EEG recording and seizure activity <i>Richard Vickery</i> WW M210
week 7 31 / 8	Current and novel drug treatments <i>Margaret Morris</i> CLB 5	Genetics of epilepsy <i>Peter Schofield</i> Biomed F	Tute: cellular and molecular basis of dysfunction of brain disorders <i>Trevor Lewis</i> Mat 107
7 / 9	mid-	session	break
Neurotrauma			
week 8 14 / 9	CNS anatomy <i>Liz Tancred</i> CLB 5	Neurotrauma types <i>Cathie Gorrie</i> Biomed F	Lab: Gross anatomy, museum specimens, histology. <i>Cathie Gorrie & Nicole Jones</i> WW 106/108 & 101E
week 9 21 / 9	Vascular & hypoxic neurotrauma <i>Nicole Jones</i> CLB 5	Mechanical neurotrauma <i>Cathie Gorrie</i> Biomed F	Tute: <i>Cathie Gorrie & Nicole Jones</i> Mat 107
Degenerative motor disease			
week 10 28 / 9	Motoneurons <i>Ben Barry</i> CLB 5	Neurodegeneration & pharmacology <i>Ross Grant</i> Biomed F	Demonstration: recording single human motor units and diagnostic techniques <i>Cindy Lin & Ben Barry</i> HESC lab
week 11 5 / 10	Clinical signs <i>Cindy Lin</i> CLB 5	Treating motoneuron disease <i>Matthew Kiernan</i> Biomed F	Tute: Discussion with a MND patient <i>Cindy Lin</i> Mat 107
Consciousness			
week 12 12 / 10	Modularity in vision <i>Richard Vickery</i> CLB 5	Binding problem <i>Branka Spehar</i> Biomed F	Lab: Visual Searches and Change Blindness <i>Branka Spehar</i> Mat 209
week 13 19 / 10	What do we actually see? <i>Branka Spehar</i> CLB 5	Neuropsychology of visual awareness <i>Spehar / McDonald</i> Biomed F	Tute: <i>Branka Spehar</i> Mat 107