

ANAT 3411 NEUROANATOMY 1

COURSE OUTLINE

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Lecturers: A/Prof Pascal Carrive (Rm 417, Lowy Bldg))
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Course Information

ANAT3411 Neuroanatomy is a 6UoC course. It is offered as component of the Anatomy major in the BSc and BMedSc or as a year 3 elective in other BSc and BMedSc programs. It is also a compulsory part of the Neuroscience major in the BSc (Adv) program. It builds on the basic knowledge of the nervous system, previously obtained in either ANAT2111, ANAT1551 or ANAT2511 and provides the background (prerequisite) for NEUR3421 Research Topics in Neuroscience (offered in Session 2). It also provides a useful (though not compulsory) basis for NEUR3221 Neurophysiology (offered in Session 2). We try to put student learning in context, with reference to the latest developments in research and discussion of relevant clinical cases and scenarios. Students will also have the opportunity to extend their understanding of a chosen area and to develop skills in self-directed learning and critical evaluation by doing a short research project.

Course Aim

The aim of this course is to provide students in the BSc and BMedSc programs with a basic understanding of the structural organisation of the human central nervous system in sufficient depth to form the basis for further clinical or research studies of the nervous system.

Specific Objectives of the Course

- (i) To provide an overview of the topography and structural organisation of the brain and spinal cord.
- (ii) To describe the basic features of development of the nervous system and to understand how and why common malformations occur in the nervous system.
- (iii) To understand the ultrastructure of neurons and glia and the major cytoarchitectural features of the brain and spinal cord.
- (iv) To obtain a basic understanding of the techniques used to investigate morphology and connections of neurons to provide the basis for further research into the nervous system.
- (v) To obtain an understanding of the functional anatomy of sensory and motor processing and higher cerebral functions such as language and emotions and to be able to apply this knowledge to the clinical situation.
- (v) To understand the principles of the blood supply and venous drainage of the nervous system and to be able to deduce the effects of rupture or occlusion of the major vessels.

Learning Outcomes

By the end of the course students will be able to identify the major features of the brain and spinal cord (using prosected specimens, models and cross-sectional images), to describe the structural and functional relationships between these structures and to apply this knowledge to further research and clinical studies.

Course Relationships

ANAT3411 is offered as component of the Anatomy major in the BSc and BMedSc or as a year 3 elective in other BSc and BMedSc programs. It is also a compulsory part of the Neuroscience major in the the BSc and BSc (Adv) programs. It builds on the basic knowledge of the nervous system, previously obtained in either ANAT1521, ANAT2111 or ANAT2511 and provides the background (prerequisite) for NEUR3211 Research Topics in Neuroscience (offered in Session 2). It also provides a useful (though not compulsory) basis for NEUR3221 Neurophysiology also (offered in Session 2).

Changes since 2011

- The course will start week 1 and end week 13. It will not run in week 8 (ANZAC day on Wednesday that week).
- There will be a revision class on long tracks for the first lecture of week 7. There will be no lecture on the second lecture slot of that week, since the spot test is scheduled for the following prac class.
- Two lectures (Reticular Formation and Chemical Systems) have been added that were not in last year's program,(but on previous years' programs).

Teaching Strategies

The course involves 6 hours per week of instruction - 2 lectures and 2 x 2 hour practical classes. In practical/tutorial classes, students working in small groups under the guidance of their tutor will identify key structures in prosected specimens, models and on sections and MRI images of the brain using computer software (BrainStorm). Students will also participate in tutorial discussion on relevant functional and clinical aspects.

Lectures

Monday	1-2 p.m.	Central Lecture Block 4
Wednesday	11-12 p.m.	Biomed F.

Tutorial/Practicals

Tuesday	12-2 p.m.	Dissecting Room (101)
Wednesday	12-2 p.m.	Dissecting Room (101)

Rm 106-108 will also be used for practical classes involving activities on computers.

Assessment

Spot Test 1	20 %
Spot Test 2	20%
Assignment (due end of week 10)	15 %
Final exam (3hr written paper)	45%

Practical and theory examinations will be based on the specific objectives, learning activities and recommended reading listed for each class. For practical examinations (Spot tests) you will be expected to be able to identify structures shown in bold type in the class notes and to answer simple theory questions about these structures.

The theory examination will include both multiple choice and written questions and will test understanding of the structural organization of the brain, spinal cord and cranial nerves and its relationship to function according to the Specific Objectives defined earlier.

The 2000 word assignment is a compulsory component of the course. It will provide an opportunity for students to develop their critical thinking skills by undertaking a literature review of current research on a topic of their interest. This report should be handed in to **Rm G27 in the BioSciences Bldg by 4.30 p.m. on Monday May 21 (beginning of Week 12)**. Marks will be deducted for assignments that are handed in after this time, unless Special Consideration is granted.

Criteria for Assessment of Neuroanatomy Assignment

These are being revised and will be distributed after the commencement of the course.

Resources

Text Book:

John Nolte: The Human Brain: An Introduction to its Functional Anatomy, 6th ed. C.V. Mosby, 2008. This is a comprehensive text.

OR

Crossman, A.R. and Neary, D. Neuroanatomy An Illustrated Colour Text, 4th ed. Churchill Livingstone, 2010. This text is adequate but covers just the essentials.

Recommended

E.Tancred and G. Coppa: BrainStorm: Interactive Neuroanatomy 3.6 (for both PC and Mac computers) available from UNSW Bookshop (online) or from Marie Kwok, Rm G3 Wallace Wurth Bldg.

Good Reference Books Available in Library

M.F. Bear, B.W. Connors and M.A. Paradiso. Neuroscience – Exploring the Brain, 3rd ed., Lippincott Williams and Wilkins, 2007.

M.J.T. Fitzgerald, J. Folan-Curran. Clinical Neuroanatomy and Related Neuroscience, 4th ed., W.B.Saunders, 2001.

J.A. Kiernan: Barr's The Human Nervous System. An anatomical Viewpoint, 9th Edition. J. B. Lippincott, 2008.

D. E. Haines: Neuroanatomy. An Atlas of Structures, Sections and Systems: 7th Edition. Urban and Schwarzenberg, 2007.

E.R. Kandel, J.H. Schwartz and T.M. Jessell, Principles of Neural Science, 4th ed. Elsevier, 2000

C. Watson, M. Kirkcaldie, and G. Paxinos, The Brain. Elsevier, 2010

Revision Facilities

BrainStorm is available on all student computers in the Wallace Wurth Building, including those in 106-108 and G2/G4. Models and dissections of anatomical structures are available in the Anatomy Museum (Rm 107). The Anatomy Museum is open from 8 a.m. – 5 p.m. Monday to Friday

Supplementary Exams

It is intended that supplementary exams for the School of Medical Sciences in Semester 1, 2012 will be held in the week commencing Monday 9th July, 2012. Please note that special considerations sought outside the 3 day time period WILL NOT be accepted except in TRULY exceptional circumstances.”

Official Communication by email

All students in ANAT3411 Neuroanatomy are advised that email is now the official means by which the School of Medical Sciences at UNSW will communicate with you. All email messages will be sent to your official UNSW email address (e.g. z1234567@student.unsw.edu.au) and, if you do not wish to use the University email system you MUST arrange for your official mail to be forwarded to your chosen address. The University recommends that you check your email at least every other day. Facilities for checking email are available in the School of Medical Sciences and in the University Library.

Academic Honesty & Plagiarism

The School of Medical Sciences will not tolerate plagiarism in submitted written work. The University regards this as academic misconduct and imposes severe penalties. Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalised by the award of a score of zero for the assessable work. Flagrant plagiarism will be directly referred to the Division of the Registrar for disciplinary action under UNSW rules.

What is plagiarism?

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.

Appropriate citation of sources therefore includes surrounding any directly quoted text with quotation marks, with block indentation for larger segments of directly-quoted text. The preferred format for citation of references is an author-date (APL) format with an alphabetically arranged bibliography at the end of the assignment. Note that merely citing textbooks or website URLs is unlikely to yield a bibliography of satisfactory standard. The internet should be avoided as a primary source of information. Inclusion of appropriate journal articles, both primary research publications and reviews, is usually expected.

Health & Safety Guidelines

Generic Safety rules for the School of Medical Sciences can be found at the following URL:

[http://medicallsciences.med.unsw.edu.au/SOMSWeb.nsf/resources/Safety+Summaries/\\$file/Rules+for+Anatomy+Students.pdf](http://medicallsciences.med.unsw.edu.au/SOMSWeb.nsf/resources/Safety+Summaries/$file/Rules+for+Anatomy+Students.pdf)

These procedures will be reviewed in the first practical class.

Regulations regarding the use of anatomical material

- (i) **Anatomical material must be treated with the utmost care and respect at all times.**
- (ii) White coats must be worn at all times in the dissecting room - not only will a white coat keep you clean and warm (the dissecting room is air conditioned to 17° C), it is a legal requirement (specified in the Anatomy Act!). White coats are not essential in the Histology labs.
In case of emergency only, disposable lab coats can be purchased for \$5 (exact money only) from Marie Kwok in Rm MG14 (Wallace Wurth) during office hours.
- (iii) Covered shoes must be worn in the dissecting room and Histology laboratory – thongs, sandals or bare feet are not permitted.
- (iv) Vinyl or latex gloves should be worn when handling material in the dissecting room.
- (v) Gross anatomy specimens should be handled with care using a probe or blunt forceps. Sharp forceps should never be used as they can damage the specimens.
- (vi) Wet specimens should be covered with wet towels after use (i.e. at the end of class).
- (vii) Students are not permitted to enter the dissecting room outside class times except when accompanied by a tutor or staff member, or when going to the service room to borrow material for revision (this is permitted during specified times – see below). The histology labs can be accessed outside class times (see below).
- (viii) It is illegal to remove anatomical material at any time, under any circumstances, from the anatomy laboratories.

Attendance

In accordance with University regulations, **students must attend at least 80% of all scheduled learning activities. Attendance at practical classes will be recorded** and students who do not attend at least 80% of practical classes may be prevented from undertaking examinations in this course.

Applications for Special Consideration

The School of Medical Sciences follows UNSW guidelines when you apply for special consideration on the basis of sickness, misadventure or other circumstances beyond your control. For further information, see:

<https://my.unsw.edu.au/student/atoz/SpecialConsideration.html>

Please note the following:

1. Applications must be submitted via UNSW Student Central. It would also be appropriate for you to inform the course convenor that you have lodged an application.
2. You must submit the application as soon as possible and certainly within three working days of the assessment to which it refers. Late applications will only be considered in exceptional circumstances.
3. Submitting a request for Special Consideration does *not* automatically mean that you will be granted additional assessment or awarded an amended result.
4. Your application will be assessed by the course convenor on an individual basis. Note that UNSW Guidelines state that special consideration will not be granted unless academic work has been hampered to a substantial degree (usually not applicable to a problem involving only three consecutive days or a total of five days within the teaching period of a semester). Under such circumstances, the School of Medical Sciences reserves the right to determine your result on the basis of completed assessments.
5. You should note that if you are granted additional assessment or a supplementary examination (which is *not* guaranteed), that assessment may take a different form from the original assessment. Furthermore, the results of the original assessment may then be overridden by the results of the additional assessment, at the discretion of the course convenor. Also be aware that a revised mark based on additional assessment may be greater or less than the original mark.

Equity and Diversity issues

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 convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or

www.studentequity.unsw.edu.au/)

Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements.

Grievance 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 Head of Department or the Department's Grievance Officer (Dr. Priti Pandey (Rm 211, Goodsell Bldg; email: p.pandey@unsw.edu.au).

**ANAT3411 NEUROANATOMY
LECTURE SCHEDULE, SESSION I, 2012**

Week	Date	Lecture (Mon 1-2 pm. CLB4 and Wed 11-12 pm, Biomed F)	
1	27 Feb	Introduction (PC)	CLB4
	29 Feb	General organisation of brain (PC)	Biomed F
2	5 Mar	Development of the CNS (KA)	CLB4
	7 Mar	Spinal cord 1 (KA)	Biomed F
3	12 Mar	Spinal cord 2 (PC)	CLB4
	14 Mar	Brainstem 1: Introduction (PC)	Biomed F
4	19 Mar	Brainstem 2: Pons, Midbrain (PC)	CLB4
	21 Mar	Cranial Nerve Nuclei (KA)	Biomed F
5	26 Mar	Cranial Nerves 3- 7 (KA)	CLB4
	28 Mar	Reticular Formation (PC)	Biomed F
6	2 Apr	Auditory System (KA)	CLB4
	4 Apr	Cerebellum (KA)	Biomed F
Semester break 9 Apr – 15 Apr			
7.	16 Apr	Review of long tracts (PC)	CLB4
	18 Apr	No lecture (Spot Test)	
Week off 23 Apr – 29 Apr			
9	30 Apr	Thalamus (PC)	CLB4
	2 May	Visual Pathways (RM)	Biomed F
10	7 May	Telencephalon (KA)	CLB4
	9 May	Basal ganglia (KA)	Biomed F
11	14 May	Hypothalamus (PC)	CLB4
	16 May	Limbic System (PC)	Biomed F
12*	21 May	Cerebral Cortex (RM)	CLB4
	23 May	Neuroplasticity (RM)	Biomed F
13	28 May	Blood supply of brain (KA)	CLB4
	30 June	Chemical Systems in the brain (PC)	Biomed F

* Assignments due by 4:30 pm. Monday May 21

PRACTICAL CLASS SCHEDULE SESSION I, 2012

Week	Date	Practical Class (Tues 12-2 pm, Wed 12-2 pm, Dissecting Rm 101)
1	28 Feb	P1 Neurohistology, research methods
	29 Feb	P2 Gross anatomy of the brain
2	6 Mar	P3 Development of the CNS
	7 Mar	P4 Spinal Cord 1: Gross, nuclei, reflexes
3	13 Mar	P5 Spinal Cord 2: Tracts
	14 Mar	P6 Brainstem 1: Medulla
4	20 Mar	P7 Brainstem 2: Pons, Midbrain
	21 Mar	P7 Cranial nerves 9 - 12
5	27 Mar	P8 Cranial nerves 3 - 7
	28 Mar	P9 Autonomic nervous system
6	3 Apr	P10 Auditory & Vestibular systems
	4 Apr	P11 Cerebellum
Semester break 9 Apr – 15 Apr		
7	17 Apr	P12 Revision
	18 Apr	P13 Spot Test
Week off 23 Apr – 29 Apr		
9	1 May	P14 Diencephalon
	2 May	P15 Retina and visual pathways
10	8 May	P16 Forebrain 1: Horizontal Slices
	9 May	P17 Forebrain 2: Coronal Slices
11	15 May	P18 Parkinson's Disease & Basal Ganglia disorders
	16 May	P19 Limbic System
12*	22 May	P20 Cerebral Cortex
	23 May	P21 Meninges, CSF & Venous drainage
13	29 May	P22 Blood Supply to the brain
	30 May	P23 Clinical Cases

The **final Spot Test** will be scheduled during the examination period

* Assignments due by 4:30 pm. Monday May 21