



HLTH214

Neuroanatomy

S2 Day 2018

Dept of Chiropractic

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff Anneliese Hulme anneliese.hulme@mq.edu.au
Credit points 3
Prerequisites HLTH108
Corequisites
Co-badged status
Unit description This unit builds on the basic anatomy taught in HLTH108. It focuses on the structure and function of the nervous system. The unit utilises an integrated approach within which relevant gross anatomy, histology and embryology, as well as clinical and applied anatomy are incorporated.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues

Relate your structural knowledge of the CNS to its embryological development

Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision

Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret

clinical case studies and published research

Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.

Show an appreciation and respect for those who have bequeathed their bodies to research

General Assessment Information

Examinations

The University Examination period in for Semester 2 is from the 12 – 30 November, 2018. You are expected to present yourself for examination at the time and place designated in the University examination timetable. The timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations: <http://www.timetables.mq.edu.au/exam>

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for special consideration. The University's Special Consideration Policy can be found at <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>. Information can also be found at <https://students.mq.edu.au/study/my-study-program/special-consideration>

Students with a pre-existing disability/health condition or prolonged adverse circumstances may be eligible for ongoing assistance and support. Such support is governed by other policies and may be sought and coordinated through [Campus Wellbeing and Support Services](#).

If a supplementary examination is granted as a result of special consideration, the examination will be scheduled after the conclusion of the official examination period.

If you receive [special consideration](#) for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the [policy](#) prior to submitting an application. You can check the supplementary exam information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an

individual notification one week prior to the exam with the exact date and time of their supplementary examination.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. You are expected to ensure that you are available until the end of the teaching semester that is the final day of the official examination period.

Returning Assessment Tasks

1. Quizzes and Mid-semester test: Your papers will be returned during the tutorial, and the tutor will review the answers. The papers must be returned to the tutor at the end of the session.
2. Practical exam: Papers will not be returned but marks will be given out prior to the final theory exam.
3. Examination: Papers will not be returned. Marks will be made available on iLearn.

Extensions and penalties

Extensions to assignments are at the discretion of the unit convenor. It is the responsibility of the student to prove to the convenor that there has been unavoidable disruption. Marks will be deducted for late submissions in the absence of an approved extension.

Grades

Achievement of grades will be based on the following criteria:

High Distinction: provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

Distinction: provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

Credit: provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.

Pass: provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.

Fail: does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of

study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

Sometimes it helps to 'translate' these descriptions into numbers. So, what we expect from you in this unit, in order for you to attain a specific grade, is outlined below:

Grade	
Pass	50 – 64%
Credit	65 - 74%
Distinction	75 - 84%
High Distinction	85 - 100%

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Eight Tutorial Quizzes</u>	15%	No	tutorial time
<u>Mid-semester test</u>	15%	No	week 7
<u>Practical exam</u>	20%	No	Week 13
<u>Final theory exam</u>	40%	No	TBA
<u>Assignment Presentation</u>	10%	No	Week 6

Eight Tutorial Quizzes

Due: **tutorial time**

Weighting: **15%**

Nine Tutorial quizzes: 10 minute quizzes held at the start of tutorials in WEEKS 3, 4, 5, 6, 9, 10, 11, 12, 13 that will test lecture and tutorial knowledge of the previous week, as follows:

as follows:

- Week 3: Cerebral cortex and limbic system
- Week 4: Diencephalon and internal capsule
- Week 5: Basal ganglia
- Week 6: Brainstem and cranial nerves

- Week 9: Cerebellum
- Week 10: Spinal cord
- Week 11: ANS
- Week 12: Special senses
- Week 13: Sensory and motor pathways

The format will be a combination of multiple choice questions, fill in the missing word/s, short answer questions. The resultant mark will be an average of the nine quiz marks. Absence from the tutorial without a disruption to studies will result in a zero mark.

On successful completion you will be able to:

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Relate your structural knowledge of the CNS to its embryological development
- Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research

Mid-semester test

Due: **week 7**

Weighting: **15%**

Mid-semester test: This will cover the work done in **lectures and tutorials** (including the Focused Application Tasks) up to and including the work done in week 6 (brainstem and cranial nerves). It will consist of a 45 minute written test made up of multiple choice questions and short answer questions.

On successful completion you will be able to:

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main

histological features of the tissues

- Relate your structural knowledge of the CNS to its embryological development
- Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research

Practical exam

Due: **Week 13**

Weighting: **20%**

Practical test: All identification activities conducted during the practical classes, and tutorial work are examinable, and include identifying structures on images, bones, models, prosections, radiographs, MRI and CT images.

On successful completion you will be able to:

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.
- Show an appreciation and respect for those who have bequeathed their bodies to research

Final theory exam

Due: **TBA**

Weighting: **40%**

Final examination: This will cover the content of the entire semester. It tests knowledge of the theory, and the ability to connect that knowledge to real life situations (e.g. case studies). It will consist of a 2 hour written exam with multiple choice questions and short answer questions.

On successful completion you will be able to:

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Relate your structural knowledge of the CNS to its embryological development
- Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research

Assignment Presentation

Due: **Week 6**

Weighting: **10%**

Assignment Presentation: during week 6, the 2h practical will be given up entirely to presentations. These will be given by student groups of 5-6 members (only). Every member of the group **must have the same** practical timeslot in order that the group can be present together during their presentation.

Groups **must be chosen by the end of week 2**, and the group must submit their names, and their topic, to the convenor via email. No more than two groups can do the same topic, and so the topics will be reviewed on a first come, first served, basis. You must not begin your preparations for your presentation until the convenor has agreed that you may proceed. This is also a help to you, as you may not have chosen an appropriate topic, and therefore, regrettably, it will be declined. You will be directed to finding another topic if it is already taken or is not suitable.

Each member of the group must have a designated role and set of responsibilities, and this must be listed at the end of the presentation. All members must present. Individual marks will be given, so it is essential that each person's contribution to the work is documented.

The subject of the presentation is a science/medical media alert that relates to neuroanatomy, or a pathology/disease associated with the nervous system. It **must be recent** i.e. 2017 – 2018.

Examples of places to explore are the following:

<https://www.technologynetworks.com/tn/lists/the-week-in-neuroscience-july-26-2018-306809>

<https://www.sciencealert.com/>

<http://www.dana.org/cerebrum/archives/>

<https://www.technologynetworks.com/>

The following questions must be answered:

1. What is the latest finding? Explain what has been discovered
 2. What is the relevant neuroanatomy associated with this finding? Discuss and explain the anatomy
 3. What are the implications of this finding for neuroanatomy/neuropathology?
- It is essential that the article chosen comes from a reputable site. If possible, find the original paper that was published in a journal (the media article usually gives the reference)
 - The presentation must be 10 minutes long with a powerpoint presentation
 - There will be 5 minutes for questions

On successful completion you will be able to:

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research
- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.

Delivery and Resources

Delivery mode

This unit is characterised by a moderate degree of flexibility. It incorporates a variety of learning tools and media. It will comprise:

1. 1 × 2h lecture and 1 × 1 hour lecture per week, weeks 1 - 13:
2. 1 × 2 hour laboratory practical class per week, weeks 2 - 13: Students must register for a practical slot on e-student
3. 1 × 1 hour tutorial class per week, weeks 2 - 13: Students must register for a tutorial slot on e-student
4. 2 – 3 hours per week revision, completing the weekly Revision tasks in the laboratory manual, preparing for the laboratory practical and tutorial, self-instructional learning and readings from the text.

Class times and locations

1. Lecture: Monday 12-2pm in 21WW, Macquarie Theatre, and Wednesday 9-10am 23WW, T2
2. Practicals: Monday 8-10am, 10-12am, 2-4pm, 4-6pm, 6-8pm in building F10A Anatomy Lab
3. Tutorials: Thursday 11-12am (14 Eastern road, 386), 12-1pm (11WW, 150), 1-2pm (14 Sir Christopher O, 264), 4-5pm (12 Second Way, 307) and 5-6pm (Sir Christopher O, 217)

Practicals

You must attend the practical and tutorial class in which you enrolled. Students must not exchange their class time. In special circumstances, students may request a specific change. These requests are to be submitted to the convenor.

Attendance Requirements

If you miss your assigned practical or tutorial in any week, you may request attendance at an alternative session, through email request and appropriate documentation to the unit convenor. This allowance may be used on a maximum of 2 occasions. **Attendance is taken at each practical and tutorial. If you miss more than 2 sessions without emailing the unit convenor to explain why, you will be asked to come in to discuss your progress.**

Unit Web Page

You can log in to iLearn System through <http://learn.mq.edu.au>

All lectures materials will be posted on ECHO Live Streaming on iLearn, which will be a single link that includes the lecture Powerpoint, additional material like videos, and the recorded lecture. Interactive materials e.g. lecture quizzes and polls will also be available at this site. Note that the lecture will be live streamed as well as recorded.

Required and recommended resources

Required:

- Haines, DE (2015) *Neuroanatomy, An Atlas of Structures, Sections, and Systems*. 9th ed. Wolters Kluwer/Lippincott Williams & Wilkins
- Krebs C, Weinberg J and Akesson E (2012) Lippincott's Illustrated Reviews Neuroscience Harvey RA (series editor) Wolters Kluwer LWW
- HLTH214 *Laboratory Course Manual* – available at Co-op bookshop. Macquarie University Printery.

Recommended:

- Kiernan, JA (2009) *Barr's The Human Nervous System An Anatomical Viewpoint*. 9th ed. Wolters Kluwer/Lippincott Williams & Wilkins, PA
- Blumenfeld H (2002) *Neuroanatomy through Clinical Cases*. Sinauer Associates Inc, Massachusetts.

Websites:

An excellent website for anatomy is now available on our Macquarie University library website. Go to Databases, choose the subject 'Chiropractic' and click on 'Anatomy.tv' for **Wolterskluwer Ovid Primal Pictures Interactive Anatomy**

4. UNIT SCHEDULE

The content is divided into 13 topics. All topics include a few selected associated pathologies for discussion

Topic 1: Overview

- The overall organisation of the nervous system (central and peripheral), anatomical

structure, histology and nomenclature

Topic 2: Ontogeny

- Overview of the embryological development of the CNS

Topic 3: Cerebral cortex

- The detailed anatomical structure (surface, sagittal and coronal), and associated function of the cortex, including selected Brodmann areas

Topic 4: Limbic System

- Limbic system structure and function

Topic 5: Diencephalon

- The detailed divisions and structures, boundaries, and functions, with emphasis on the thalamus as the gateway of the cerebral cortex and the multiple functions of the hypothalamus

Topic 6: Basal ganglia

- Classification, detailed structure, position and role in modifying motor control

Topic 7: Brainstem

- The divisions, detailed anatomy and function of the brainstem as a conduit, centre of most cranial nerve nuclei, and integrator of information
- The reticular formation

Topic 8: Cerebellum

- Detailed gross anatomy, general microanatomy, multiple inputs and functional circuitry

Topic 9: Spinal cord, plexuses and peripheral nerves

- The detailed gross anatomy and cross-sectional structure, with emphasis on the fibre tracts of the spinal cord

Topic 10: Autonomic nervous system

- Classification, gross architecture, anatomy and function of the sympathetic and parasympathetic divisions of the autonomic nervous system

Topic 11: Special sensory pathways

- Identification of the neurological pathways of the special senses viz vision, hearing, balance, olfaction and taste

Topic 12: Somatosensory pathways

- Tracing ascending pathways

Topic 13: Motor pathways

- Tracing pyramidal and extrapyramidal descending pathways, and the role of the basal ganglia and cerebellum in the planning and monitoring of movements

Unit Schedule

Timetable for Lectures, Practicals and Tutorials

Date	Monday (2h) & Wednesday (1 h): LECTURES	Monday: PRACTICALS (2 hours)	Thursday: TUTORIALS (1 hour)
Week 1 Monday, July 30	Overview Ontogeny	None	None
Week 2 Monday, August 6	Cerebral cortex and limbic system	Organisation of the nervous system, meninges and ventricles	Organisation of the nervous system, ontogeny, meninges and ventricles
Week 3 Monday, August 13	Diencephalon and Internal Capsule	Cerebral cortex and limbic	Cerebral cortex and limbic
Week 4 Monday, August 20	Basal ganglia	Diencephalon and Internal Capsule	Diencephalon and Internal Capsule

Week 5 Monday, August 27	Brainstem and Cranial Nerves	Basal ganglia	Basal ganglia
Week 6 Monday, September 3	Brainstem and Cranial Nerves	Presentations	Brainstem and Cranial Nerves
Week 7 Monday, September 10	Cerebellum	Brainstem and Cranial Nerves	Test
September 17 – 28 MIDSEMESTER BREAK			
Week 8 Tuesday, October 2	Labour Day Monday/ Spinal cord Wednesday	Labour Day	Test feedback Radiology
Week 9 Monday, October 8	Spinal cord	Cerebellum	Cerebellum
Week 10 Monday, October 15	ANS	Spinal cord	Spinal cord
Week 11 Monday, October 22	Special senses	ANS	ANS
Week 12 Monday, October 29	Sensory pathways	Special senses	Special senses
Week 13 Monday, Nov 5	Motor pathways	PRACTICAL EXAM	Sensory and motor pathways

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4*

December 2017 and replaces the Disruption to Studies Policy.)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#).

The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Relate your structural knowledge of the CNS to its embryological development
- Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research

Assessment tasks

- Mid-semester test
- Final theory exam
- Assignment Presentation

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret

clinical case studies and published research

- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.
- Show an appreciation and respect for those who have bequeathed their bodies to research

Assessment tasks

- Eight Tutorial Quizzes
- Mid-semester test
- Practical exam
- Final theory exam

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
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Assessment tasks

- Eight Tutorial Quizzes
- Mid-semester test
- Practical exam
- Final theory exam
- Assignment Presentation

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Relate your structural knowledge of the CNS to its embryological development
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Assessment tasks

- Eight Tutorial Quizzes
- Mid-semester test
- Practical exam
- Final theory exam
- Assignment Presentation

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
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- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research
- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal

radiographs, MRI and CT scans.

Assessment tasks

- Eight Tutorial Quizzes
- Mid-semester test
- Practical exam
- Final theory exam
- Assignment Presentation

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Relate your structural knowledge of the CNS to its embryological development
- Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research

Assessment tasks

- Mid-semester test
- Final theory exam
- Assignment Presentation

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Describe in detail the organisation, structure and function of the cerebral cortex, brainstem, diencephalon, cerebellum, basal ganglia, limbic system, reticular formation and spinal cord. This includes the meninges, ventricular system, blood supply and main histological features of the tissues
- Trace somatic and autonomic: sensory inputs in detail from receptor to cortex, via brainstem and thalamus; and motor outputs from motor cortex to effector organ, including the additional inputs from the basal ganglia, cerebellum and frontal cortex. This includes a detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research
- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.

Assessment tasks

- Eight Tutorial Quizzes
- Mid-semester test
- Final theory exam
- Assignment Presentation

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Extend your acquired knowledge of neuroanatomy to discuss, evaluate and interpret clinical case studies and published research

- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.
- Show an appreciation and respect for those who have bequeathed their bodies to research

Assessment tasks

- Practical exam
- Final theory exam

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Participate in practical sessions in which the knowledge acquired in texts and lectures is applied in a group situation. You should be able to reason, question and communicate your understandings to each other and your tutors as you complete tasks set in the practicals. Develop a competency in analysing, interpreting and assessing relevant anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.
- Show an appreciation and respect for those who have bequeathed their bodies to research

Assessment tasks

- Practical exam
- Final theory exam

Changes from Previous Offering

A group presentation assignment, worth 10%, has been added to this year's assessment. The presentations have been given a time slot during week 6 of the practicals. The final exam is now worth 40% (50% in 2017).

The practical stations have been reduced from three to two, and the work has been rationalised to fit this. This has been done by a review panel that analysed the existing material and removed those sections that have not been as useful to the learning process e.g. there were not enough prosections on the topic. The physical space in the anatomy lab has changed (reduced), and this also necessitated a reduction in physical stations.

The tutorials have been reworked to a Team Based Learning mode of delivery, an active teaching method based on the Flipped Classroom.

Changes since First Published

Date	Description
28/07/2018	The assignment information has been altered: previously it said only one person can present; now it says everyone in the group must present. Some examples of places to find information has also been added