HLTH214

Neuroanatomy

S2 Day 2015

Dept of Chiropractic

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
Stephney Whillier
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C5C West Wing, room 362
Please contact me to arrange an appointment

Credit points
3

Prerequisites
HLTH108(P) and HLTH109(P) and HLTH213(P)

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 and phylogeny.

Trace somatic and special 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

Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings

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

Attendance Requirements

A minimum of 80% attendance at practical classes is required in order to successfully complete this unit.

You must attend the class in which you enrolled. Students must not exchange their class time. In special circumstances, students may apply for requests regarding changes. These requests are to be submitted to the scientific officer.

Examinations

The University Examination period in for Second Half Year 2015 is from 9 November to 27 November 2015.

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. Information about unavoidable disruption and the special consideration process is available at http://www.reg.mq.edu.au/Forms/APSCon.pdf

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. (Individual

Divisions may wish to signal when the Division's Supplementary exams are normally scheduled.)

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

You must apply for a 'Disruption of Studies" within 5 days after the scheduled exam. If you sit an exam and put in for disruption to studies you will not receive a grade for the exam that you attended. If you are granted a supplementary, the grade you received in the supplementary will be used toward your mark, irrespective of whether it is better or worse than the original grade.

The supplementary does not need to be in the format of the original exam. If you miss the supplementary examination, and are considered eligible for a substitute supplementary, it will be in the form of a VIVA.

Returning Assessment Tasks

1. Mid-semester test: Your papers will be returned during the tutorial, and tutors will review the answers. The papers must be returned to the tutors at the end of the session.

2. Assignment: the rubric sheet will be returned to the students with feedback comments.

2. Practical exam: Papers will not be returned and marks will not be given out prior to the final theory exam. Marks will be incorporated into the final unit grade.

3. Examination: Papers will not be returned. Marks will be incorporated into the final unit grade.

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.

Assessment Tasks

Name	Weighting	Due
revision exercise quizzes	10%	November 6
Assignment	20%	Mon, 26 October, 9am
Mid-semester test	10%	Week 7
Practical exam	20%	Week 13
Final theory exam	40%	TBA

revision exercise quizzes

Due: **November 6**
Weighting: **10%**

Completion of revision exercises: For each week of the practical there is a first year neuroanatomy revision section to be completed in the practical manual. It is up to you to complete this section, which is examinable in the midsemester and final exam. For each of these weekly revisions there is a quiz, which is posted on iLearn. All quizzes are open throughout the semester. Students are required to complete all the quizzes by the end of week 13, Friday, November 14. Each quiz must be completed in 10 minutes once started, and the quiz can only be attempted once. All quizzes must be done and a mean is taken of all, with a zero assigned to those that were not done. Once the deadline of November 14 is reached, the quizzes will no longer be available, and will not be opened UNDER ANY CIRCUMSTANCES.

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 and phylogeny.
- Trace somatic and special 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

Assignment

Due: **Mon, 26 October, 9am**
Weighting: **20%**

Create and design a Learning Map of the Nervous System. A Learning Map is 'A graphical representation of complex information designed to allow effective assimilation of the material. Learning maps typically display major concepts on a two dimensional grid, with connecting lines between related concepts that describe the nature of the relationship.' (http://www.businessdictionary.com/definition/learning-map.html#ixzz2W48MJH3J)

Incorporate all the aspects of the nervous system you have learnt into a map that shows anatomical and functional relationships between the various parts. Be as creative and detailed as you wish. The representation can be on a ppt slide, a large sheet of paper, a poster, a three dimensional structure. A rubric will be given in the lectures and some examples of what can be done.

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 and phylogeny.
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detailed knowledge of the specific ascending and descending pathways, and the pathways for taste, smell, hearing, balance, and vision
- Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings

Mid-semester test

Due: **Week 7**
Weighting: **10%**

Mid-semester test: This will cover the work done in lectures and practicals up to and including the brainstem. It will consist of a 1.5 hour written test with 10 MCQs and 5 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 and phylogeny.
- Trace somatic and special 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

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
- Relate your structural knowledge of the CNS to its embryological development and phylogeny.
- Trace somatic and special 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
- 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 and phylogeny.
- Trace somatic and special 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

- Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings

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 **first year** 'Revision for Quiz' tasks in the laboratory manual, completing the online quizzes, self instructional learning and readings from the text.

Class times and locations

Lectures: Monday 1-3pm in E7B T2, and Wednesday 9-10 am E7B T3

Practicals: Wednesday 11-1, 1-3 or 3-5pm in building F10A Anatomy Lab, ASAM

Tutorials: Thursday 1-2pm (W6B 338), 2-3pm (W6B 338), 3-4pm (W6B 286) or 4-5pm (W6B 286)

For students doing neuroanatomy within CHIR603 of the first year of the Masters of Chiropractic degree:

1. Lecture: Monday 1-3pm in E7B T2, and the Wednesday lecture is to be watched on ECHO on the HLTH214 iLearn webpage
2. Practicals: Wednesday 1-3pm in building F10A Anatomy Lab, ASAM
3. There are no Thursday Neuroanatomy Tutorials

Unit Schedule

Week #, Monday Date	Monday (2h) & Wednesday (1 h): LECTURES	Wednesday: PRACTICALS (2 hours)	Thursday: TUTORIALS (1 hour)
W1 – 27 July	Overview Ontogeny	None	None
W2 – August 3	Cerebral cortex and limbic system	Cerebral cortex and limbic	Cerebral cortex and limbic
W3 – August 10	Diencephalon and Internal Capsule	Diencephalon and Internal Capsule	Diencephalon and Internal Capsule
W4 – August 17	Basal ganglia	Basal ganglia	Basal ganglia
W5 – August 24	Brainstem and Cranial Nerves	Brainstem and Cranial Nerves	Brainstem and Cranial Nerves
W6 – August 31	Brainstem and Cranial Nerves	Revision	Radiology
W7 – September 7	Cerebellum	TEST	Cerebellum
September 14 – 25 MIDSEMESTER BREAK			
W8 – September 28	Spinal cord	Cerebellum	Test feedback
W9 – October 5 is Labour day, so only Wednesday lecture	Spinal cord	Spinal cord	Spinal cord
W10 – October 12	ANS	ANS	ANS
W11 – October 19	Special senses	Special senses	Special senses
W12 – October 26	Sensory pathways	Sensory and motor pathways	Sensory and motor pathways
W13 – November 2	Motor pathways	PRACTICAL EXAM	Revision and preparation for the final exam

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the Learning and Teaching Category of 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/support/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://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use 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 and phylogeny.
- Trace somatic and special 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
- Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings
- 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 task

- Assignment

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
- Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings
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- Show an appreciation and respect for those who have bequeathed their bodies to research

Assessment task

- 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

- revision exercise quizzes
- Assignment
- Mid-semester test
- Practical exam

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 and phylogeny.
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- Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings
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Assessment tasks

- revision exercise quizzes
- Assignment
- Mid-semester test
- Practical exam
- Final theory exam

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
- Relate your structural knowledge of the CNS to its embryological development and phylogeny.
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Assessment tasks

- revision exercise quizzes
- Assignment
- Mid-semester test
- Practical exam
- Final theory exam

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 and phylogeny.
- Trace somatic and special 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
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anatomical structures on images, photographs, bones, models, prosections, normal radiographs, MRI and CT scans.

Assessment tasks

- revision exercise quizzes
- Assignment
- Mid-semester test

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
- Relate your structural knowledge of the CNS to its embryological development and phylogeny.
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Assessment tasks

- Assignment
- Mid-semester test
- Final theory exam

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

- Use your acquired knowledge of neuroanatomy to evaluate case studies, research these cases further using appropriate texts and databases and communicate your findings
- 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 task

- Practical 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 task

- Practical exam