



UNSW
THE UNIVERSITY OF NEW SOUTH WALES

Faculty of Medicine
School of Medical Sciences

ANAT1521

Anatomy for Medical Science



Session 2 - 2010

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In his bodily structure Man shows such remarkable resemblances to the lower animals that it now seems astonishing to us that his kinship with them should ever have been controverted. His skull and skeleton are composed of the same bony elements, his muscular system is made up of identical muscles disposed in the same general pattern, his heart and blood-vessels are constructed on exactly the same plan, and even his brain (though it is more elaborate) is made of the same kind of nervous tissue and built up on a foundation of the same basic elements. Anatomically, therefore, Man is simply one of the animals.

W. E. Le Gros Clark, *History of the Primates*, 1962, p. 1

Cover illustration: One of the Vesalius plates (drawn by Calcar).
From: Hixson, J. 1966. *The History of the Human Body*. Cooper Square Publishers, Inc.

Course convenor

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Units of credit

This course is worth six units of credit (6 UOC).

Hours per week

Five hours per week (5 HPW) comprising two hours of lectures and three hours of laboratory time.

What is anatomy?

Anatomy literally means to break apart or separate the human body into its parts; to dissect the body. The earliest recorded anatomy teachers, Herophilus and Erasistratus, lived in Ancient Alexandria and taught anatomy between 300 BC and the second century AD. However, the roots of anatomy go back much further – perhaps 4,000 years ago – with the mummification practices of the Ancient Egyptians and with the Ancient Greek physicians. The most famous anatomist is the Ancient Roman Galen, whose work remained the standard for almost 1,300 years until the European Renaissance. During and after the Renaissance, anatomy developed into a modern scientific discipline. Therefore, anatomy is one of the oldest scientific fields and one that has always and continues to underpin medicine. It is also a well established scientific discipline in its own right.

Anatomy is a dynamic and diverse science that considers the structures of the body from the cellular level through to the body's external surface and beyond. Anatomy examines the cells and tissues of the body (cell biology and histology), the systems of the body (integumental, skeletal, muscular, nervous, cardiovascular, lymphatic, respiratory, alimentary, urinary, genital and lymphoid systems), the joints, movements and biomechanics of the human body, human comparative and evolutionary anatomy (anthropology), the development of the embryo and postnatal growth of the infant and child, as well as clinical and radiographic anatomy. Anatomy at UNSW teaches and researches across most of these areas. Note that the term *gross anatomy* refers to the study of the structures of the body that are observable without the aid of microscopes (i.e. the naked eye) and which can be palpated (touched), while *microanatomy* is sometimes used to refer to the microscopic structures of the body (e.g. tissues; the subject of histology).

Course aim

The aim of this course is to:

Provide students with a solid foundation in the gross anatomy of the whole human body.

Student learning outcomes

Students should complete the course knowing (among other things):

1. *Practical laboratory skills in anatomy and an understanding of the ethics of working with human remains.*
2. *The basic plan of the human body; its major tissue types, body planes, spatial relations and movements.*
3. *Some general anatomical terms including common suffixes and prefixes.*
4. *The role and importance of the skeletal system, the names of major bones, and the names and functions of some major bony features.*
5. *The role and importance of the muscular system, the names of major muscles and muscle groups and their major functions.*
6. *Major types of joints in the human body and the basic structure of joints.*
7. *The role and importance of the central nervous system, its major functional divisions, the names and functions of its major components*

8. *The major peripheral nerves and their main functions.*
9. *The role and importance of the cardiovascular system and the names and functions of its major components.*
10. *The role and importance of the respiratory system and the names and functions of its major components.*
11. *The role and importance of the urinary system and the names and functions of its major components.*
12. *The role and importance of the genital systems and the names and functions of their major components (males and females).*
13. *The role and importance of the alimentary system and the names and functions of its major components.*
14. *The capacity to apply knowledge and to think critically within the anatomical sciences.*

The University of NSW has developed a list of attributes which its graduates should possess upon graduation (the 'graduate attributes'). The curriculum and assessment of this course have been designed to help students to develop these capabilities. Students completing the course will have gained knowledge and skills that contribute to directly to them acquiring these attributes during their study at UNSW. One way this has occurred is through curriculum mapping of this course.

For Science, the UNSW graduate attributes are as follows:

1. *Research, inquiry and analytical thinking abilities.* Technical competence and discipline specific knowledge. Ability to construct new concepts or create new understanding through the process of enquiry, critical analysis, problem solving, research and inquiry.
2. *Capability and motivation for intellectual development.* Capacity for creativity, critical evaluation and entrepreneurship. Ability to take responsibility for and demonstrate commitment to their own learning, motivated by curiosity and an appreciation of the value of learning.
3. *Ethical, Social and Professional Understanding.* Ability to critically reflect upon broad ethical principles and codes of conduct in order to behave consistently with a personal respect and commitment to ethical practice and social responsibility. Understanding of responsibility to contribute to the community. Respect and value social, multicultural, cultural and personal diversity.
4. *Communication.* Effective and appropriate communication in both professional (intra and inter disciplinary) and social (local and international) contexts.
5. *Teamwork, collaborative and management skills.* Ability to recognise opportunities and contribute positively to collaborative scientific research, and to perceive the potential value of ideas towards practical applications. Demonstrate a capacity for self management, teamwork, leadership and decision making based on open-mindedness, objectivity and reasoned analysis in order to achieve common goals and further the learning of themselves and others.
6. *Information literacy.* Ability to make appropriate and effective use of information and information technology relevant to their discipline.

Course relationships

Anatomy for Medical Science is the foundation course for all advanced (Level III) gross anatomy courses at UNSW: *Visceral Anatomy* (ANAT3121), *Functional Anatomy 1* (ANAT3131), *Functional Anatomy 2* (ANAT3141) and *Neuroanatomy* (ANAT3411). A number of other courses offered by anatomy compliment these gross anatomy offerings: *Histology: Basic and Systematic* (ANAT2241), *Embryology: Early and Systematic Development* (ANAT2341) and *Human Evolution* (ANAT2611). Moreover, those students with an interest in microanatomy and development will find the Level III course *Cell Biology* (ANAT3231) of interest. More generally, anatomy courses compliment the subjects offered by other areas within the School of Medical Science (i.e. Physiology, Pharmacology, Pathology and Health and Exercise Science) as well as courses taught in biological science, biomolecular science

and genetics, psychology, biomechanics, vision science, food science and nutrition, medical microbiology and immunology, and engineering.

Teaching rationale

While in many ways this course is quite conventional, especially in terms of teaching strategies, students are strongly encouraged to engage with the ideas and materials covered. The role of the teacher (lecturer/tutor) is to impart knowledge, but also to help students navigate their way through the vast subject that is anatomy. Students should feel free to question and think critically, even about basic knowledge covered; things that might be considered unwavering ‘facts’. With this in mind, students are strongly encouraged, and will be supported to be, enquiring; to ask questions, make pertinent observations, and to share experiences and knowledge with the lecturer/tutors and classmates. The philosophy of the course is also fundamentally about helping students to develop an enthusiasm for learning, especially about their own body and biology. This course also aims to exploit the teaching-research nexus, by feeding research findings and developments, as well as knowledge and skills of the teachers, into teaching and learning.

Teaching strategies

Teaching and learning are a mixture of traditional style lectures and laboratories, as well as videos, where relevant. This course comprises one two hour lecture, and one three hour laboratory, per week (total of five hours per week).

Lecture	Laboratory/practical
Wednesday 10.00 – 11.00 a.m. Rex Vowels Theatre	Tues – 10 a.m. -1 p.m. OR Thurs 9 a.m. – 2 noon OR Fri 1 p.m. – 4 p.m.
Wednesday 3.00 – 4.00 p.m. Mathews Theatre A	Venue: Dissecting Room (WW101)

Ethical behaviour and human remains

In this course, you will be required to study human anatomical (prosected = professionally dissected) specimens. Each year, people donate their bodies to UNSW so that you and your colleagues can learn about the human body directly from their remains. These are precious materials provided through the extraordinary generosity of the public (our donors and their families). This is a special privilege afforded very few people. By law, responsibility to the donor and their family members, and as a matter of good ethical practice you must treat all human remains with great respect and care.

Anatomical terms

One of the largest challenges for new students in anatomy is learning anatomical terms. In many ways the process is like learning a new language. All scientific disciplines have a set of terms and across the whole of science they are derived mostly from Latin and Ancient Greek words. Why Latin and Ancient Greek? Latin, in particular, is a ‘dead’ language, meaning that no one alive today uses it as the ‘mother’ tongue. Thus, it is not subject to fashions and constant change, like most living languages, especially English. Moreover, the spelling of Latin and Ancient Greek words has been agreed to for a long time.

In Australia and other English speaking countries, anatomical terms are Anglicised (translated to English). This means that in many cases the terms we teach are the English equivalent of the Latin or Greek word (e.g. Latin = *Corpus ossis ilii*; English = Body of the ilium). There are, however, still plenty of Latin and Greek terms used. Their pronunciation, however, is an entirely different matter. It varies greatly across English speaking countries; even at UNSW you will find lecturers employing different pronunciations, partly as a result of where they learned their anatomy! What matters is that we all know which structure we are referring to when we use a particular term; there are no points for correct pronunciation as most of the variants are equally correct!

An international organisation called the *Federative Committee on Anatomical Terminology* with representatives from many countries has published the standard (agreed) set of anatomical terms that anatomists follow. It is called *Terminologia Anatomica* and the last edition was published in 1998. Most internationally oriented textbooks (such as *Gray's Anatomy*) apply *Terminologia Anatomica*. In this course, we strive also to use this standard set of anatomical terms as much as possible as we believe that it represents best international practise as well, as making it easier for you to learn.

The terms that you need to know in laboratory classes are given in **bold**. You should, however, endeavour to understand all of the information given in laboratories in order to do well in the course.

Assessment

1. Spot Test 1	25%
2. Spot Test 2	25%
3. Theory Exam	50%

1. Spot tests

Spot tests are held to assess student knowledge of course content and to assess deeper learning. Spot tests will cover knowledge learned and skills obtained during laboratory classes. *Format:* students will have approximately 3 minutes each at up to 15 stations (plus some rest spots) to answer questions relating to models/specimens. At some stations there may be theory questions relating to the structures examined as well. Tests usually run no more than 1 hour. This assessment contributes to the development of graduate attributes 1-4 (see above).

- Spot Test 1:
 - Covers lectures and laboratories up to and including 'Spinal Nerves and the ANS'
To be held Week 7 during the lecture slot. Details to be announced.
- Spot Test 2:
 - Covers lectures and laboratories from the 'Brain and Cranial Nerves' onwards
To be held during the examination period

2. Theory Exam

A single 2 hour written exam will be held during the formal examination period to assess student knowledge of course content and to assess deeper learning (such as the ability to make connections between ideas or to assess capacity for problem solving). The written exam will comprise 40 multiple choice questions and 3 essay questions (1 musculoskeletal, 1 nervous and 1 visceral), and will test knowledge obtained from lectures and laboratories. Some questions may draw upon tables, graphs or pictures used in the classes, or may involve identification of anatomical structures from pictures (drawings or photographs).

Failure to sit a test

Failure to sit a test without lodgement of an application for consideration with Student Central will lead to automatic failure of the test. A student may be required to sit a separate exam or written assignment in place of a missed test.

Resources for students

Recommended Text

Marieb, Mallat & Wilhelm (2008). *Human Anatomy: International Edition*. 5th ed., Pearson Benjamin Cummings.

Other books that are very useful and may be used instead as texts. (available in the Library):

- *Snell, R. (2006). *Clinical Anatomy by Systems*. Lippincott, Williams and Wilkins. (About \$100 at UNSW Bookshop)
- Drake, R. (2005). *Grays Anatomy for Students*. Churchill Livingstone. (About \$110 at UNSW Bookshop)
- Moore, K. & Dalley, A. (2005). *Clinically Oriented Anatomy*, 5th ed. Lippincott, Williams and Wilkins. (About \$110 at UNSW Bookshop). Very detailed.
-
- Rohen, J., Yokochi, C. & Lütjen-Drecoll, E. (2006). *Color Atlas of Anatomy: A Photographic Study of the Human Body*, 6th ed. Lippincott, Williams and Wilkins. (About \$130 at UNSW Bookshop)

*Most compatible with this course.

Lecture recordings

Digital recording of all lectures will be made via the University's *Lectopia* (formerly *i-Lecture*) system. Lecture PowerPoint presentations will also be available for the student to view whilst listening to these recordings (within a couple of days of the lecture being given). Lectures will also be downloadable as PodCasts. Note that hardcopies of the lecture will not be provided. Lectures and accompanying materials will be available on the *WebCT* course homepage.

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 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.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism. Knowingly permitting your work to be copied by another student may also be considered to be plagiarism. Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material. The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

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.

Grievance procedures

If you have a problem or grievance with the course, you should first attempt to resolve it with the course authority. If you feel that your grievance has not been resolved in this way, it should be directed to the Departmental Grievance Officer, currently Dr Priti Pandey (p.pandey@unsw.edu.au).

Continual course improvement

In this course evaluative feedback on this course is gathered at the completion of the course, using among other means, UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback. Based on feedback from 2009, the amount of material covered in some practical classes has been modified slightly. No other changes have been made.

Guidelines on extra-curricular activities affecting attendance

1. Background to Guidelines

This policy relates to the following extra-curricular activities:

1. Employment.
2. Voluntary work.
3. Sport, music or other recreational activities.
4. Student-related activities e.g. conferences, courses
5. Academic activities e.g. conferences, courses.

2. Guidelines

1. Failure to meet attendance requirements because of extra-curricular activities will not be accepted unless prior approval is obtained.
2. Failure to meet assessment requirements (e.g. failing to submit assignment by deadline, failing to attend an examination) because of extra-curricular activities will not be accepted unless prior approval is obtained.
3. Under no circumstances will external work requirements be accepted for non-attendance. The School understands the need for many students to work part-time but this must be arranged so as it does not affect attendance.
4. Approval for non-attendance will be considered for the following activities:

- A single, significant activity related to voluntary work. Note that regular voluntary work will not be accepted for recurrent absences.
 - A single, significant activity related to sport, music or other recreational activity being undertaken at an elite or semi-professional level. Note that regular sporting or other recreational activities will not be accepted for recurrent absences.
 - Attendance at student-related conferences/courses organised by student organisations or health professional groups and national or international education meetings.
 - Attendance at conference for academic purposes including presenting papers from Honours projects.
5. Approval to attend an extra-curricular activity must be obtained before the event and will not be taken into consideration retrospectively if a student has failed to meet attendance or assessment requirements.
6. Approval to attend an extra-curricular activity does not exempt a student from meeting attendance or assessment requirements. Approval will depend on:
- The overall impact on attendance and whether class or other teaching activities can be made up at an alternative time to ensure that the course requirements have been met. Students requesting long periods of absence will be required to take leave and attempt the course later.
 - The nature of the assessment and whether an alternative mechanism is available to meet the assessment requirement. This may include extension of a deadline for submission of an assignment or sitting an examination at a later time. As a rule, additional examinations cannot be held and a student would be required to sit a missed examination when supplementary or later rounds are being conducted. This may delay a student's progress.
- Approval will not be granted if alternative arrangements for meeting attendance or assessment requirements cannot be made.
7. Approval will also depend on the student's academic performance and will not be granted if disruption to the student's progress would be considered disadvantageous.

3. **Obtaining permission to attend extra-curricular activities**

1. Approval to be absent from a course for one week or more, or when the 80% attendance rule may be contravened, must be obtained from the Course Convenor. Students must contact the Course Convenor as early as possible to ensure that alternative arrangements can be made. Late requests are unlikely to be approved, as alternate arrangements cannot be made without sufficient notice.
2. If temporary absence from a course is approved, the student must inform the School of Medical Sciences student administrator (Carmen Robinson).

The School of Medical Sciences will not consider financial consequences to students (e.g. loss of registration fees for conference, loss of grant) if students have already made arrangements to attend extra-curricular activities without approval.

Course Schedule: Semester 2, 2010

Week	Date	Lecture	Date	Laboratory
1	21 Jul 10-11 21 Jul 3-4	What is Anatomy? General Anatomy Skeletal System 1	Tues Thu, Fri	No prac class General Anatomy & Skeletal System 1
2	28 Jul 10-11 28 Jul 3-4	Skeletal System 2 Articular System	Tues Thu, Fri	General Anatomy & Skeletal System 1 Skeletal System 2 & Articular System
3	4 Aug 10-11 4 Aug 3-4	Muscular System 1 - Muscles of Axial Skeleton Muscular System 2 - Muscles of Upper Limb	Tues Thu, Fri	Skeletal System 2 & Articular System Muscular System 1
4	11 Aug 10-11 11 Aug 3-4	Muscular System 3 - Muscles of Lower Limb Nervous System 1 - Spinal Cord	Tues Thu, Fri	Muscular System 1 Muscular System 2 & Spinal Cord
5	18 Aug 10-11 18 Aug 3-4	Nervous System 2 - Spinal Nerves Nervous System 3 - Autonomic Nervous System	Tues Thu, Fri	Muscular System 2 & Spinal Cord Spinal Nerves & Autonomic Nervous System
6	25 Aug 10-11 25 Aug 3-4	Nervous System 4 – Brain Nervous System 5 - Cranial Nerves	Tues Thu, Fri	Spinal Nerves & Autonomic Nervous System Revision
7	1 Sept 10-11 1 Sept 3-4	Spot Test? Spot Test?	Tues Thu, Fri	Revision Brain and Cranial Nerve
		<i>Session Break (6 - 10 Sept)</i>		
8	15 Sept 10-11 15 Sept 3-4	Nervous System 6 - Eye Nervous System 7 - Ear	Tues Thu, Fri	Brain & Cranial nerves Eye & Ear
9	22 Sept 10-11 22 Sept 3-4	Cardiovascular System 1 (heart) Cardiovascular System 2 (vessels)	Tues Thu, Fri	Eye & Ear Cardiovascular System
10	29 Sept 10-11 29 Sept	Respiratory System 1 Respiratory System 2	Tues Thu, Fri	Cardiovascular System Respiratory System
11	6 Oct 10-11 6 Oct 3-4	Digestive System 1 Digestive System 2	Tues Thu, Fri	Respiratory System Digestive System
12	13 Oct 10-11 13 Oct 3-4	Urinary & Male Reproductive Systems Female Reproductive System	Tues Thu, Fri	Digestive System Urinary & Reproductive Systems
13	20 Oct 10-11 20 Oct 3-4	No Lecture No Lecture	Tues Thu, Fri	Urinary & Reproductive Systems No prac class

Lectures will be given by either Dr. Liz Tancred or Dr. Craig Hardman.