



ANAT2511
FUNDAMENTALS OF ANATOMY
SESSION 2: 2011

**ANAT2511 FUNDAMENTALS OF ANATOMY
COURSE OUTLINE 2011**

Course Convenor: **Dr Nalini Pather**
Office: Room 111, Level 1, 30 Botany Street
Telephone: 02 9385 8025
Email: N.Pather@unsw.edu.au

I am available for consultation and discussion by prior appointment via telephone or e-mail.

Lecturers: **Dr Nalini Pather**
Patrick de Permentier

Units of Credit

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

Hours per week

This course entails 6 hours per week comprising two hours of lectures and two two-hours of laboratory time.

What is Anatomy?

Anatomy is derived from Greek and comes from the words 'ana' (meaning to *separate, apart from*), and 'temnein' (meaning to *cut up, cut open*). Anatomy, therefore, is the study of body structure or morphology. Our knowledge of Human Anatomy is founded on the dissection of human cadaveric tissue.

In this course, the discipline of anatomy is subdivided into:

- Gross or macroscopic anatomy – the study of anatomical structure as seen by the naked eye, and
- Histology or microscopic anatomy – the study of cellular structure of the tissues of the human body using microscopy.

The structure of each organ is fundamental to, and specifically adapted for, the functions of that organ. Understanding the macroscopic and microscopic structure of the human body will assist you in appreciating the functioning of each of the organs of the body.

Anatomy can be studied as body systems (e.g. skeletal, muscular, and digestive) or as regions (e.g., head and neck, upper limb, lower limb etc.). In this course, you will learn the principles underlying the organisation of the human body through a study of body systems. The structural organisation of each body system is essential to appreciating the functions of the system.

Course aims

This course is designed as a stand-alone subject for students who will benefit from knowledge of basic anatomy but who do not necessarily wish to pursue further studies in anatomy.

The aim of this course is to provide students with an understanding of the structural organisation of the human body at a gross (macroscopic) and histological (microscopic) level i.e. the position, form and structure of organs and 'systems'. The course is designed to provide an understanding of the human body that underpins its functioning and medical and biomedical engineering designs. The course provides an overview of the structure of the major components of each of the body systems. In parallel, students are also provided with an overview of the microscopic structure of tissues and the major systems of the body. The course is strengthened by an emphasis on the relationship between structure and function. In addition, students will gain familiarity with anatomical and medical terminology and their meanings.

Students are provided the opportunity to appreciate and value the medical sciences especially anatomy and at the end of the course, to leave with an increased sense of awareness and value of the human body and improved capacity to make informed decisions regarding health.

Student learning outcomes

The course is dedicated to the most important organ systems (musculoskeletal, respiratory, cardiovascular, nervous, digestive, reproductive and sensory organs). At the end of the course, the student will be able to appreciate the structure of the above systems and how this structure optimises the organ functioning. Recent advances in medical and biomedical engineering research related to anatomy will also be discussed.

Student engagement particularly through the gross anatomy practicals will equip them to be able to identify the anatomical features of each of these systems on dissected human specimens, bones and models, as well as applying these to discussion of functional and applied aspects of the body system. Histology practicals focus on the identification of cells and tissues, viewed by virtual microscopy images of real tissue, again with consideration of their functions.

Through the team based learning activities, students will also develop written and oral skills in scientific communication, and the ability to peer-review and evaluate scientific writing and presentations.

Teaching Rationale and strategies

Student learning and engagement with the content of the course underpins all learning activities. Students are initially introduced to the body systems (both microscopic and

macroscopic) in the form of lectures incorporating multimedia learning tools. With this knowledge in hand, students engage in learning activities during the laboratory sessions where the teacher/tutor guides the student and encourages each student to actively participate in their learning. Students are always encouraged to question, observe and share knowledge and experiences that help their learning and that of their peers. The anatomy laboratory is a wonderful and fascinating environment for discovery and students are given every opportunity to explore the cadaveric specimens, participate in active discussions and find answers for themselves.

Through this course students also engage in team based learning through the practical component of the course, and through the compulsory group assignment for this course. Students will be allocated into teams for this component. Learning how to learn, work, interact, and collaborate in a team is essential for success in future career environments. In addition, there is strong evidence that team based learning supports greater student engagement and longer retention of knowledge.

Attendance

It is strongly recommended that students attend all lectures as they provide the basis for the laboratory classes. In order to satisfy the requirements of the course you are expected to attend **at least 80% of practical classes** and failure to do so (without good reason) may result in an unsatisfactory fail.

| | Lectures | Laboratory |
|-----------------|---|---|
| Thursday | 10-11am, Biomed E, Wallace Wurth | 1-3pm, Room G2-G4 (histology labs) Wallace Wurth |
| Friday | 10-11am, Biomed E, Wallace Wurth | 1-3pm, Dissecting Hall Room 101, Wallace Wurth |

Assessment

| | |
|--|------|
| Team based learning assignment and continuous assessment | 20% |
| Midterm Practical test (Gross Anatomy and Histology) | 20 % |
| Final Practical test (Gross Anatomy and Histology) | 20 % |
| Final Theory exam | 40 % |

Team based learning

During the first week of the course you will be divided into 4 practical/tutorial groups and each group will be further subdivided teams of 5 students each. Each team will have a mixture of abilities and backgrounds. The use of team based learning is designed to improve your learning experience through the use of individual and team quizzes and peer-teaching in an interactive discussion facilitated by a tutor.

These quizzes will be based on pre-readings, lectures and practical sessions. You should therefore make every attempt to engage in all the learning situations provided in the course. The quizzes will be distributed at the beginning of selected practical sessions.

ANAT 2511 Fundamentals of Anatomy – Session 2, 2011

These quizzes will be attempted individually and the answers submitted to your tutor. The same quiz questions will then be attempted in teams, with each team submitting their consensus answers. The tutor will then facilitate an interactive discussion of each question and provide clarifications on the challenging questions and concepts. The practical session will then continue with the tasks outlined in your course manual.

You will receive a maximum of **2%** towards your final course mark for each tutorial quiz, comprising **1%** for your individual performance and **1%** for your group's performance. Over the duration of the semester, 5 of these tutorial/practical sessions will contribute to **10%** of your final marks.

The tutorial and team groups will be posted on BlackBoard by Week 2. These teams will also work together on the group project.

Teams will be given a choice of assignment topics in Week 2. The team assignment task is to:

- Research the topic using published literature including recent journal articles
- In Week 8, present a 10minute overview of your topic to the class using a PowerPoint presentation, followed by a short time for audience questions. You will be peer assessed and receive feedback from your presentation
- In turn, your team will peer assess a presentation by another team (on a similar topic) using a marking rubric that will be provided
- Produce a 2000 word written report on your topic (marking criteria below) that will be submitted in Week 10 via TurnItIn in BlackBoard. A printed copy also needs to be submitted to the School Office (BSB), Room G27, Biosciences Building.
- Each member will submit a 500 word reflection on their learning through the project, the effectiveness of the team and their contributions to the team
- In addition, each member of the team will complete an evaluation of the other team members based on their preparedness for the team based class activities and the level and quality of contribution to the team based assignment tasks.
- Marks will be deducted for assignments that are submitted after the deadline (Friday, 8 October 2011 at 5pm).

TEAM BASED ASSIGNMENT MARKING CRITERIA

Scientific content (8 marks)

- Identifies the major concepts related to the assignment topic
- Demonstrates an understanding of the assignment topic
- Uses peer-reviewed research articles to support the argument and facts

Effective Communication (4 marks)

- Clarity – clear, simple language, terms defined
- Logical structure, use of headings and paragraphs
- Appropriate language, length, style and format
- Appropriate use of media (graphs, images, video, etc.)

Self-directed learning (4 marks)

- Sources (range, citation standards, quality, relevance)
- Critical thinking (evidence of awareness of bias in sources, others viewpoints, own views, logical argument)

Team work (4 marks)

- Each team member contributes knowledge and skills to the team tasks
- Team has actively devised a plan for the task (plan outlines the tasks, resources needed, process for decision making, due dates, regular follow-up and feedback)

Recommended Text

Tortora, G.J., & Derrickson B. Introduction to the Human Body - The Essentials of Anatomy & Physiology. 8th ed., John Wiley and Sons Inc. 2010, ISBN 978-0-470-23016-9.

An additional useful text for the Anatomy component of this course

Please note, this text is **not compulsory** to purchase.

Hull, Kerry Coloring Atlas of the Human Body, Lippincourt, Wilkins and Williams ISBN-13: 978-0-7817-6530-5

A supplementary text for the Histology component of this course

Please note this text is **not compulsory** to purchase.

Young, B., Lowe, S., Stevens, A. and Heath, J.W., Wheater's Functional Histology: A Text and Colour Atlas, 5th ed., Churchill Livingstone, 2006. ISBN -13:9780443068508.

Other useful resources on histology and electron microscopy are:

1) A website showing basic and systems virtual histology slides

http://www.neocortex.ch/WebMic_GenOrg/allgspez/WebMicGenOrg.html

2) Fabric of Life

3) A Digital Atlas of Electron Microscopy by Bruechner, University of Kentucky

All the above can be accessed by using the icon on the student computers.

Go to Class Menu at the bottom of the screen followed by Anatomy at the top of the screen.

Official communication by email

All students in ANAT2511 Fundamentals of Anatomy are advised that email is the official means by which the School of Medical Sciences at UNSW will communicate with you. All email messages will be sent to your official UNSW email address and, if you do not wish to use the University email system, you **MUST** arrange for your official mail to be forwarded to your chosen address. The University recommends that you check your email at least every other day. Facilities for checking email are available in the School of Medical Sciences and in the University Library. Further information and assistance is available from DIS-Connect (phone: 8365 1777). Free email courses are held by the UNSW Library.

Preparation of anatomical material

In the **gross anatomy** practicals, you will have the privilege of working with dissected human specimens, as well as dried bones, models and radiological images. These dissections are obtained from cadavers, which have been generously bequeathed (donated) to the University, prior to death. As soon as possible after death, the body is brought to the University where it undergoes a process known as embalming, which involves flushing the blood out of the arterial system and then infusing it with a colourless preserving solution known as formalin. The specimens are then dissected to show specific anatomical features. Dissected specimens are stored in a preservative solution and placed on tables for class use. In some cases, dissected specimens are impregnated with a curable polymer in a process known as plastination, which produces dry non-toxic specimens, which have the texture of firm plastic.

For **histological study**, an organ needs not only to be preserved, as discussed above, but also to be prepared for studying under a microscope. This includes cutting a very thin slice (usually 8µm thick) of the tissue and staining it with dyes so that the contrast between components of the tissue and cells is enhanced. These slides have been digitally imaged for you to study on a computer screen and examined as a virtual microscope slide.

Rules for Anatomy Students

1. Students are required to attend **each lecture & the assigned tutorial/laboratory class** unless given special permission. Provision of an appropriate medical certificate to the course authority will be required for Special Consideration.
2. You may **enter** and **view** specimens in the Dissecting Room 101 **only** in the presence of your tutor and/or during your designated tutorial/laboratory class hours. You are **not allowed** to take visitors into the Dissection Room.
3. Photography and video recording is **not permitted** in the Dissecting Room 101, or the Anatomy Museum 105.
4. **Protocol:** When in the Dissecting Room, you are requested to:
 - **never eat or drink;**
 - wear a white laboratory **coat** before you enter the lab- not only will a white coat keep you clean and warm (the dissecting room is air conditioned to 17°C), it is a

legal requirement (specified in the Anatomy Act!). White coats are not essential in the histology laboratory rooms;

- if you have forgotten to bring the lab coat for the day, a disposable lab coat can be bought from the laboratory technicians;
 - wear covered **shoes**, not thongs;
 - wear latex or vinyl **gloves** when touching wet specimens;
 - never put anything in your **mouth**, e.g., biros or pencils from the table;
 - use blunt **forceps** only to handle specimens and **probes** to point to structures, and **never pull** at any parts of the specimen;
 - as far as possible, **avoid inhaling** preservative solutions for prolonged periods (if you feel in need of fresh air, ask permission to leave the laboratory for a few minutes);
5. **And** at the end of your laboratory:
 - **cover wet specimens** with the towels provided;
 - **replace stools** under the tables in your cubicle;
 - **wash your hands** and instruments.
 6. Great **care** should always be exercised when handling specimens, in order to preserve their delicate structure. Much work has gone into the **prosection** of each specimen before it is ready for use in class.
 7. You are learning from human material prepared from people who have generously donated their bodies for the benefit of science. Apart from caring for the specimens, it is important for all students learning Anatomy to have and show **utmost respect** for the specimens at all times, in the Dissecting Room, Room 101, and in the Anatomy Museum Room 105. It is **illegal** for any anatomical material to be removed from the premises of the Department of Anatomy for any purpose whatsoever (except of course, for the funeral). All anatomy specimens are micro chipped for identification and record keeping.
 8. **Preservative solution.** Most anatomy specimens are stored in 2% phenoxyethanol, which is classified as non-toxic. You should always wear gloves when handling specimens. Detailed information about phenoxyethanol is posted on the Dissecting Room notice board. A few specimens (brain tissue, etc.) are stored in formaldehyde, which is toxic if ingested, and corrosive to the eye; it can also be absorbed through the skin. Formaldehyde is reported to cause allergic skin and respiratory effects. The potential for adverse health effects, however, is markedly reduced at the concentrations used for embalming and storage of specimens in the Dissecting Room, i.e., the “formalin” solution is less than 5% of a 37% solution of formaldehyde. The specimens provided for classes are without any formalin, moreover with air-conditioning the air in the dissecting room is continuously changed. Essentially, you should prevent any preservative solution from coming in direct contact with your eyes, skin or mouth. If assistance is needed during office hours you may approach **Room 101** for **First Aid**.

Revision Facilities

1. Anatomy Museum – located on the 1st floor of the Wallace Wurth building. The museum contains a variety of bottled anatomical dissections. Please do not remove museum jars from shelves. The museum also contains computers loaded with Anatomy software and internet access. Access to the museum is by swipe card and is restricted to anatomy students only, between 8.30 a.m. and 5.30 p.m. Monday to Friday. NO photography is allowed in the Anatomy Museum.
2. Rooms 106 – 108 in the Wallace Wurth Building contain computers with a variety of anatomical software, including the Virtual Microscope. Access to this laboratory is by student swipe card only.
3. Histology laboratories (G2/G4) are generally open from about 8.30 a.m. to 5.30 p.m. Monday to Friday. They may be used by students during these hours, provided **the rooms are not required for other classes**. Again these are accessible by swipe card only.
4. Useful Computer Resources on histology and electron microscopy are:
 - A website showing basic and systems virtual histology slides http://www.neocortex.ch/WebMic_GenOrg/allgspez/WebMicGenOrg.html
 - The interactive histology program “**The Fabric of Life**”
 - **A Digital Atlas of Electron Microscopy** by Bruechner, University of Kentucky accessed by using the icon on the student computers.

Plagiarism

The School of Medical Sciences will not tolerate plagiarism in submitted written work. The University regards this as academic misconduct and imposes severe penalties

http://www.student.unsw.edu.au/academiclife/assessment/academic_misconduct.shtml.

Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalized by the award of a score of zero for the assessable work. Flagrant plagiarism will be directly referred to the Division of the Registrar for disciplinary action under UNSW rules.

The attention of students is drawn to the following extract from the above website:

“The basic principles are that you should not attempt to pass off the work of another person as your own, and it should be possible for a reader to check the information and ideas that you have used by going to the original source material. Acknowledgment should be sufficiently accurate to enable the source to be located speedily.”

The following are some examples of breaches of these principles:

- a) Quotation without the use of quotation marks. It is a serious breach of these rules to quote another’s work without using quotation marks, even if one then refers to the quoted source. The fact that it is quoted must be acknowledged in your work.
- b) Significant paraphrasing, e.g., several sentences, or one very important sentence, which in wording are very similar to the source. This applies even if the source is mentioned, unless there is also due acknowledgment of the fact that the source has been paraphrased.

- c) Unacknowledged use of information or ideas, unless such information or ideas are commonplace.
- d) Citing sources (e.g., texts) which you have not read, without acknowledging the 'secondary' source from which knowledge of them has been obtained."

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

OH&S – Safety Guidelines

Generic Safety rules for the School of Medical Sciences can be found at the URL below. These procedures will be reviewed in the first practical class <http://medicalsciences.med.unsw.edu.au/SOMSWeb.nsf/page/Policies%20and%20Procedures>

Applications for Special Consideration

Students who miss an assessment due to illness or misadventure must submit an application for special consideration within 3 working days of the event to Student Central. Full details of application and the required documentation may be found at <http://my.unsw.edu.au/student/academiclife/assessment/AssessmentatUNSW.html>

Problems with the course

If you have any problems with the course you should, in the first instance, consult the **Course Organiser**. If you are unable to resolve the difficulty, you can consult the School's nominated **Grievance Resolution Officer** (details will be posted on BlackBoard or may be obtained from the School Administrator, Ms Carmen Robinson, Room G27, Biosciences Building).

Acknowledgements and changes to the course for 2011

The original practical laboratory notes that follow this outline were received from Dr Cathy Gorrie (2010). These have been extensively revised for the course in 2011.

For 2011, the following changes have been made

- Assessment – the course assessment has been changed to include a component of teamwork which makes up a fifth of the course marks. This assessment task includes class laboratory activities, a team assignment and presentation.
- Tutorials and laboratory sessions – this has been redesigned to include team work as an important component. Team work has previously been shown to enhance student learning and engagement, performance in learning.
- Lectures – the histology of the endocrine system and its accompanying laboratory session has been incorporated into other laboratory sessions.

ANAT 2511 Fundamentals of Anatomy – Session 2, 2011

LECTURE AND TUTORIAL SCHEDULE, 2011

Lectures: 2 x 1 hour each per week Practicals: 2 x 2 hours each per week

G: GROSS ANATOMY; H: HISTOLOGY

| WEEK | DATE | LECTURE: 10-11 am Biomed E | LABORATORY: 1-3pm <i>H: Rm G2-G4 Histology Lab;</i> <i>G: Dissection Hall, Rm 101, Wallace W</i> |
|---|-------------------|---|--|
| 1 | 21.07.2011 | Introduction to course & anatomy I | NO LABS |
| | 22.07.2011 | Introduction to anatomy II | |
| 2 | 28.07.2011 | H: Basic tissues | H: Introduction to Histology |
| | 29.07.2011 | G: Skeletal system | G: Introduction to Gross Anatomy |
| 3 | 04.08.2011 | H: Bone and joints | H: Basic tissues |
| | 05.08.2011 | G: Muscular System | G: Skeleton and joints |
| 4 | 11/08.2011 | H: Muscle | H: Bone and joints |
| | 12.08.2011 | G: Nervous System I (spinal cord & nerves) | G: Muscular system |
| 5 | 18.08.2011 | H: Nervous Tissue | H: Muscle |
| | 19.08.2011 | G: Nervous System II (brain) | G: Spinal cord and nerves |
| 6 | 25.08.2011 | G: Nervous System III (eye, taste) | H: Nervous tissue |
| | 26.08.2011 | G: Nervous System (ear and balance) | G: Brain and REVISION |
| 7 | 01.09.2011 | H: Integumentary System | G: SPOT TEST I WILL COVER WORK FROM WEEK 1- 6 |
| | 02.09.2011 | H: SPOT TEST 1: WILL COVER WORK FROM WEEK 1- 6 | |
| MID SESSION RECESS | | | |
| 8 | 15.09.2011 | Team based presentations | Team based presentations |
| | 16.09.2011 | G: Cardiovascular System | G: Eye, Ear and taste |
| 9 | 22.09.2011 | H: Circulatory System | H: Integumentary System |
| | 23.09.2011 | G: Respiratory System | G: Cardiovascular System |
| 10 | 29.09.2011 | H: Respiratory System | H: Circulatory System |
| | 30.09.2011 | G: Digestive System | G: Respiratory System |
| 11 | 06.10.2011 | H: Digestive System | H: Respiratory System |
| | 07.10.2011 | G: Urinary System | G: Digestive System |
| 12 | 13.10.2011 | H: Urinary System | H: Digestive System |
| | 14.10.2011 | G: Reproductive System | G: Urinary and Reproductive Systems |
| 13 | 20.10.2011 | NO LECTURE | H: Urinary System |
| | 21.10.2011 | WRAP UP LECTURE | G: REVISION SESSION |
| SPOT TEST 2 WILL COVER WORK FROM WEEK 7-13 | | | |