



Faculty of Medicine

School of Medical Sciences

Department of Anatomy

ANAT3131

**FUNCTIONAL ANATOMY 1
(6 UOC)**

Class Notes and Workbook

SESSION I, 2010



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ABOUT ANAT3131, FUNCTIONAL ANATOMY 1, 2010

Course - Authority/ Convener/ Organiser:

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Room G5, Wallace Wurth Building,
Room 211, Goodsell Building
ph: 9385 2483
email: p.pandey@unsw.edu.au

Lecturers:

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email: p.pandey@unsw.edu.au

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Room 308, John Goodsell Building
ph: 9385 8025
email: n.pather@unsw.edu.au

Course Information:

ANAT3131 Functional Anatomy 1 is a 6 UOC course for Science level III, Medical Science, and Health & Sports Science students. The course **aim** is to provide a detailed information and knowledge about the Musculoskeletal Anatomy of the human body in the regions of the Upper Limb and the Head, Neck, Face. The course provides the functional basis for the human structure. The course extends from the foundation made by its prerequisites: Introductory Anatomy (ANAT2111), Anatomy for Medical Science (ANAT1521) and Fundamentals of Anatomy (ANAT2511). It also accepts non-award students, transfer students from another course or University. The applications of these students are evaluated by the course authority based on the criteria for acceptance into the course, including the completion of the prerequisites.

Course review 2008

After being the course authority for Functional Anatomy 1 during 2008, the course has been reviewed and a few major changes have been brought into the course. Following changes have been made into the course based on the instructions from the Teaching coordinator:

- 1) The course content leads with the **upper limb (UL)** and the head, face and neck is placed at end of course. Focus on UL is of musculoskeletal anatomy rather than regional anatomy, i.e. focus on joint function and muscles that produce movement. Lymphatic drainage of upper limb is retained with reduced

emphasis. The emphasis on clinical problems is good and should continue (e.g. carpal tunnel syndrome, rotator cuff injury).

- 2) The material on **head and face** is shortened and simplified.
- 3) The eye and orbit lecture and practical class have been removed altogether.
- 4) Overview of skull focuses on the skull base (as lead-in to vertebral muscles) and the number of foramina covered is reduced.
- 5) Muscles of mastication and TMJ are retained but at a simple level.
- 6) Face and scalp - only major facial muscles needed to be covered and the names and location of the other muscles of face is completely removed.
- 7) The **Neck**: the suprahyoid and infrahyoid muscles are retained but at a simpler level.
- 8) The cranial nerves are simplified with a focus mainly on trigeminal and facial nerve.
- 9) The cervical plexus is retained at a simpler level.
- 10) Vasculature: the external carotid branches are retained but only those branches that supply scalp and face.
- 11) The lymphatics are removed and transferred to ANAT3121, the Visceral anatomy.
- 12) Introduction of two lectures on **biomechanics**: one on mechanical properties of bone, cartilage and ligament; the other on muscle and tendon.

The lab manual has been extensively edited in 2010.

Course overview and Teaching strategies:

ANAT3131 focuses on the musculoskeletal anatomy and thus you will learn the joint, its function and the muscles that produce that function. In the past it had been a regional anatomy approach, where the students learnt the bones, joints and muscles of a region and carried on to the next region. The teaching and learning in this course is outlined in the schedule of **lectures** (two per week) and **tutorial/laboratory classes** (one three hour lab per week) given below.

Lectures:

- Focus on the introduction and an overview of the topic/s, with emphasis on functions of the various musculoskeletal structures of the body and clinical relevance.

The laboratory classes:

- Complement the lectures, and involve hands-on work in the learning of bones, joints, models, the wet and plastinated prosected specimens, cross-sectional images

(where applicable) and radiographs.

- It is necessary for the students to know that each student is put into a laboratory class group with a tutor. It is **absolutely compulsory** for the students to stay in their allocated laboratory group for the whole session.
- In the laboratory classes, every student is required to be involved into the inquiry and take an active participation in their learning process.
- **It is the student's responsibility to make sure that all the Aims and Activities are fully understood at the end of each laboratory class.**
- There is an inclusion of the living surface and palpatory anatomy, with an aim to develop an ability to apply the anatomical knowledge to the living human body. Surface anatomy is examinable via photographs during practical examinations and via questions during theory examinations.

Study methods:

- The study of human body can never be not interesting, a useful suggestion will be: to apply the learning of facts and concepts to yourself and the learning of functions to the activities you perform in your daily life. **Appendix on Surface Anatomy** is very helpful for the purpose.
- **Sketching:** Anatomy is a visual discipline. Each laboratory is accompanied by a set of sketch drawings, which demonstrate anatomical concepts or facts. An attempt will be made to label some of the drawings in the lectures. A good set of colour pencils will be useful to bring along in the lectures. Students are encouraged to complete the drawings on their own and sketch bones, muscles, organs – any sketch, no matter how crude or simple, will assist you to learn anatomy.
- Students **should** access a **textbook** and a **colour atlas** of anatomy.
- Remember the prior existing knowledge from your prerequisite courses is very important. You are expected to use this knowledge and build on to create the new.
- To get the best benefit out of your lectures and laboratory classes you **must** read up relevant notes prior to the class.
- Try and learn for the meaning and thus develop an understanding rather than memorise for the sake of examination.
- Remember learning in this subject goes beyond merely getting good grades or passing the examinations.
- The course convener is a strong believer of a collaborative learning atmosphere and peer learning. You must actively take part in the discussion on the **web-CT** or the **equivalent (BBL9)** by posting your questions, misunderstandings, a relevant case study, personal clinical

experiences or a new discovery and stimulating your peers to contribute to the discussion. Peers are the best resources a student has! However if you do not get any of your peers to respond I will respond!

- Be consistent with your studies, use right approaches to study and if you have a problem, approach the course authority.

Graduate attributes:

“Graduate attributes are the qualities, skills and understandings a university community agrees its students should develop during their time with the institution.”

Bowden et al (2000). Generic capabilities of ATN universities.

In this course an attempt is made to include the following Science Graduate Attributes

(<http://www.science.unsw.edu.au/science-learning-and-teaching/>). These are also aligned with the UNSW Graduate Attributes (number in brackets)

http://www.ltu.unsw.edu.au/ref4-4_graduate_attributes.cfm.

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; (aligned with: (1) The skills involved in scholarly inquiry & (10) An appreciation of and responsiveness to change).
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; (aligned with: (2) An in depth engagement with relevant disciplinary knowledge in its disciplinary context).
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. (aligned with: (3) The capacity for analytical and critical thinking and creative problem solving; (7) An appreciation of and respect for diversity; and (11) A respect for ethical practice and social responsibility).
4. *Communication* (aligned with: (12) The skill of effective communication).
5. *Teamwork, collaborative and management skills:* an 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. (aligned with: (4) The ability to engage in independent and reflective learning; and (9) Skills required for collaborative and multidisciplinary work).

6. *Information literacy*: An ability to make appropriate and effective use of information and information technology relevant to their discipline. (aligned with (5) Information literacy).

Learning outcomes:

A student who has completed the course should have:

- A sound knowledge of the functional gross anatomy of the upper limb and head, neck & face.
- An understanding of biomechanical properties of the basic tissues of the human body; describe different factors of mechanical loading that influences the occurrence and extent of injury; and the individual human factors that can predispose an injury.
- An understanding of the radiological anatomy.
- A capacity to apply the learning to the living human being in state of health, injury and disease process.

BBL9 Website for assisted learning:

This course uses **BBL9** for i-lectures, accessory lecture notes (wherever applicable), announcements and discussions. More information regarding instructions and requirements will appear on **BBL9** under announcements and a pop-up message will appear when you log on to **BBL9**.

Be advised that the **BBL9** discussion is strictly for education requirements related to this course. Students must not use this for personal or social discussions. This section is regularly monitored for its proper use. If the students are found to misuse this learning and teaching resource the facility will be withdrawn and this unfortunately will affect the whole class.

Course details Time:

Session 1, 2010

Teaching period: 01 March to 04 June

Mid-semester break: 02 April to 11 April

Study period: 5 June – 10 June

Examination period: 11 June –28 June

Lectures:

Monday 2 - 3 pm (Biomedical Theatre A) AND

Tuesday 3 - 4 pm (Biomedical Theatre C)

Please note that the lectures are designed to provide preliminary information and an overview of the topic and is a prerequisite for learning in the labs. Although there will be iletecture recordings and lecture notes on the BBL9 (originally webCT), it is advisable for the students to attend both lectures for achieving better learning outcomes.

Labs/tutorials/ Demonstrations

Group 1: Thursday, 9 – 12 noon (Dissecting Room WW101E)

Group 2: Friday, 9 – 12 noon (Dissecting Room WW101E)

Please note that the students will be assigned to group 1 or group 2 and within each group they will be assigned to a tutor and a cubicle in the lab. Each student is required to attend only one lab per week, a choice of Thursday or Friday 9 – 12 noon. Please attend the lab at your assigned time and remain in your assigned lab and tutorial group through the entire session.

If you have any problems please do not make any changes on your own accord. You must consult and discuss your problems with your course co-ordinator.

***You must not miss more than two labs during the teaching period** (see below in Conduct of Students).*

Conduct of students:

The University takes academic misconduct seriously. The information regarding this can be found at

<https://my.unsw.edu.au/student/academiclife/assessment/AcademicMisconductStudentMisconduct.html>.

It is your civil responsibility to be aware of your conduct and respect and value social, multicultural, cultural and personal diversity.

Dissecting Room.

- You may enter and view specimens in the Dissecting Room 101 **only** in the presence of your tutor and/or during your designated and or scheduled laboratory class hours. Please read the ***RULES for ANATOMY STUDENTS*** for your conduct in the lab classes.
- You are not allowed to take **any** visitors into the Dissection Room.
- Satisfactory attendance at lectures and tutorial/laboratory classes is mandatory.
- Please be aware if you have missed more than **two**

lectures and/or Lab classes, your Lecturer and the Laboratory Demonstrator will alert you. A student not meeting the requirements of attendance may be restrained from sitting for the assessment/s.

- Every illness or misadventure should be supported by a relevant medical certificate and submitted to the Student Central within **3** working days of the event. The students who do not report and submit the medical certificate via the **New South Q, UNSW** (Student Central) will not be considered.
- *Applications for Consideration.* Students who miss an assessment through illness or misadventure must submit an application for consideration within **three** working days to New South Q. Full details for the application (e.g., Medical Certificate, etc.) are available at <http://www.student.unsw.edu.au/atoz/atoz-Special.html>
- **Laboratory coats must be worn in the Anatomy Laboratory. Closed shoes that cover the full front and back of the foot are a must to wear. You must wear gloves when handling wet specimens.** You must remember to bring your Lab coats but in case of emergency, disposable lab coats can be purchased from the Room NG14, Ground Floor, Wallace Wurth Building. Thin disposable gloves can be bought in bulk from supermarkets; **bring at least two pairs for each lab. The mobile phones must be turned off during the lectures and laboratory classes.**
- Supplementary requirements for students in the Department of Anatomy are listed below under ***RULES for ANATOMY STUDENTS.***

Text Book:

The student in this course is expected to have a textbook and an atlas of choice/preference. You may bring your Atlas with you to the lab classes, for quick reference.

Moore, KL. *Clinically Oriented Anatomy*, Lippincott Williams & Wilkins **or**

Drake, RL, Vogl W and Mitchell AWM, *Gray's Anatomy for Students*, Elsevier Churchill Livingstone **or**

Marieb, EN, *Human Anatomy and Physiology*, 5th edition. 2008, Pearson Benjamin cunnings, California.

If you have any doubts, please do not hesitate to discuss your textbook that you have used previously, with your course organiser or laboratory demonstrator.

Recommended Atlas:

Rohen, JW, Yokochi, C. & Lutjen-Drecoll. *Color Atlas of Anatomy*, Lippincott Williams & Wilkins, or Netter, FH. *Atlas of Human Anatomy*, Novartis,

Reference books:

Hoppenfeld, S. (1977) "Orthopaedic Neurology" (Open Reserve)

Kapit, W & Elson, LM. *The Anatomy Coloring Book*, Addison Wesley.

William Whiting & Ronald Zernicke, *Biomechanics of Musculoskeletal Injury*, Human Kinetics, Champaign IL USA, 1998.

Benno Nigg & Walter Herzog, *Biomechanics of the Musculoskeletal System*, 3rd edition, John Wiley & Sons, Chichester UK, 2007.

Stuart McGill, *Low Back Disorders: Evidence-Based Prevention and Rehabilitation*, Human Kinetics, Champaign IL USA, 2002.

[Several relevant sections addressing joint stiffness and mobility](#)

Florence Kendall et al., 4th / 5th edition, Lippincott Williams & Wilkins, Baltimore MD USA, 2005 *Muscles: Testing and Function with Posture and Pain*.

Joseph Hamill & Kathleen Knutzen, 2nd edition, Lippincott Williams & Wilkins, Baltimore MD USA, 2003 *Biomechanical Basis of Human Movement*.

Other Resources:

Anatomy Images, CD-ROM produced in Department of Anatomy is available to the students for purchasing at \$15 each from the SOMS administration office, Room MG14, Wallace Wurth Building. Some of you may already own this from your previous Anatomy course. This CD-ROM contains images of the specimens, models etc. used in the dissecting room and have a command available for self-test. Students in the past have found it a very useful learning resource.

Glossary & Spelling: Correct spelling of terms and concept is important in any discipline – please learn to use the **Glossary** at the end of these notes.

The M.A. Arnold Glossary is also available online at: <http://medicalsciences.med.unsw.edu.au/SOMSWeb.nsf/page/Science+Current+Students/>. You may use anatomical abbreviations given in this glossary.

Anatomy Museum is located in Room 105, Wallace Wurth Building and is accessible using your student card as a swipe card. Please note that for access to the Anatomy Museum, your card must be encoded at the UNSW Security Office in the Red Centre after the start of the Session.

Skilfully dissected specimens have been mounted in glass bottles in the Anatomy Museum **Room 105**. In 2001, under the project “3-D Real Human Atlas”, extensively labelled and catalogued prosected human specimens were created as an additional resource to the variety of learning resources that have been made available to the students.

The main aim of the museum is to support student learning with the availability of bones, models, and excellent quality specimens for revision. In addition these provide flexibility to the students to study in their own time. It helps students to get involved in peer learning, discussions, self-directed learning and self-assessment.

Safety in the museum:

- Always handle museum specimens with care and respect. All specimens consist of generously donated human tissue and have been painstakingly dissected by the staff, many of whom have passed on and thus making them extremely precious and irreplaceable.
- The specimens are preserved in fixative solutions, which contain a variety of toxic compounds
- Students are requested to be extremely careful around the jars and the display cabinets.
- For reasons of hygiene and OHS issues, never take food or drink into the museum.
- Do not move the specimens from their shelves. Never leave a museum specimen on the floor, or in any precarious position.
- If a specimen is leaking, turn it upside down to prevent further leakage, then immediately inform Mr Vincent Strack or anyone in the service area of the dissecting room or a member of academic staff.
- If a specimen is broken, do not attempt to wipe up the spillage. You must immediately inform Mr Vincent Strack or anyone in the service area of the dissecting room or a member of academic staff.
- Remember that a lot of goodwill of the donators and work and time of the staff has been devoted to the museum for your benefit. Thus your cooperation in maintaining neatness and safety at all times is appreciated.

Library Resources:

Ms Kate Dunn, the Outreach librarian, University library, The UNSW has kindly provided following links and information for the students to use as additional resources.

·Primal Pictures <<http://info.library.unsw.edu.au/cgi-bin/local/access/access.cgi?url=http://ovidsp.ovid.com/ovidweb.cgi?T=JS&MODE=ovid&PAGE=main&NEWS=n&DBC=y&D=ppen>> 3D interactive anatomy database

·Library Subject Guide for Anatomy:

<http://subjectguides.library.unsw.edu.au/content.php?pid=8701&sid=56148>

<<http://subjectguides.library.unsw.edu.au/content.php?pid=8701&sid=56148>>

·The Library holds a variety of 3D anatomical models for students: They are housed in My Course Reserve, level 2.

Student support services:

Those students who have a disability or a medical condition that requires some adjustment in their teaching or learning and/or examination environment are encouraged to discuss their needs with the Course Convenor prior to, or at the commencement of their course. All these cases should also be reported with the Equity Officer (Disability) at: (9385 4734) or <http://www.equity.unsw.edu.au/disabil.html>.

Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional examination and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made. As far as possible do not plan elective surgeries or medical appointments during your lecture or lab times, as these will disrupt your own learning.

Information on designing courses and course outlines that take into account the needs of students with disabilities can be found at:

www.secretariat.unsw.edu.au/acboardcom/minutes/coe/disabilityguidelines.pdf

Administrative Matters:

Each week: The student is expected to attend both lectures and the assigned tutorial/laboratory class that one has enrolled into. **Please do not change your tutorial groups without consulting with your course authority.**

Please study the relevant notes before each lecture & tutorial/laboratory class. Additional notes when applicable **may** be available on the course homepage.

Anatomy is a visual subject and hence to facilitate student learning the lecturer may use some relevant diagrams.

Students are also expected to check the Vista website regularly for announcements, tests and/or additional resources.

Students are encouraged to use the discussion part of the BBL9 (webCT vista) for their questions related to their course material. Your questions can be answered by your peers and/or the course authority. Remember the content and quality of discussion is regularly monitored by me.

Administrative staff:

Ms. Marie Kwok

Position: Administrative Officer (Anatomy)

Location: Administrative Wing, Room MG14, Ground floor
Wallace Wurth Building

Contact number: 9385 2480

Ms Kwok is responsible for the matters related to the administration of Department of Anatomy. She can assist in arranging interviews with academic staff within the Department as well as sale and delivery of CD-ROMs to students.

Ms. Carmen Robinson

Position: Teaching Administrative Assistant

Location: Administrative Wing, Room MG14, Ground floor
Wallace Wurth Building

Contact number: 93852464

Ms Robinson is responsible for general administration and student support within the School of Medical Sciences.

Mr. Vincent Strack

Position: Manager Dissecting Room

Location: Level 1 Room 101 Wallace Wurth Building

Mr Strack will not be in direct contact with the students but provides support for all Anatomy Museum related issues. Mr. Strack also can be contacted regarding lost property within the premises of the dissecting room and/or the Anatomy Museum.

Ms. Jennifer Heartley

Position: OH&S Co-ordinator for SOMS

Location: Administrative Wing, Room MG14, Ground floor
Wallace Wurth Building

Mr Heartley is in-charge of the OH&S issues within the Wallace Wurth Building.

Contact number: 93858288

Academic Honesty & Plagiarism:

The students are reminded that cheating on someone else's work during examination (practical or theory) is classified under academic dishonesty. The student link for Plagiarism and Academic Integrity is at

<http://www.lc.unsw.edu.au/plagiarism/link.html>. This website also has information on academic misconduct and it is advisable to be familiar with the University policies.

Presently there are no assignments in this course, but the following is included here for your information:

Plagiarism is the presentation of the thoughts or work of another as one's own.

Examples include:

- Direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork,

- design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- Paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
 - Piecing together sections of the work of others into a new whole;
 - Presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and,
 - Claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†
 - Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism.
 - The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.
 - Students are reminded of their Rights and Responsibilities in respect of plagiarism, as set out in the University Undergraduate and Postgraduate Handbooks, and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms.
 - The Learning Centre website is the central University online resource for staff and student information on plagiarism and academic honesty. Individual assistance if requested is available from The Learning Centre. It can be located at: www.lc.unsw.edu.au/plagiarism .The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students 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.
 - 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.*

Official communication

Students in the course ANAT3131 are advised that e-mail is the official means by which the School of Medical Sciences at UNSW will communicate with you. All email messages will be sent only to **your official UNSW email address** (e.g., z1234567@student.unsw.edu.au). If you do not wish to use this student address, you must arrange for your official mail to

be forwarded to your chosen address. It is recommended that you check your mail at least every 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, tel.: 9385 1777. The UNSW Library runs free email courses.

Students should make sure that their address that is listed on the UNSW files is current and may wish to provide their alternate contact numbers (e.g. **mobile number**) for contact in case of need.

Occupational Health and Safety (OHS) Rules:

OH&S enquiries and issues are taken seriously in School of Medical Sciences (SOMS) and you must not hesitate to approach any staff with your issue. The SOMS has general rules for ensuring safety of staff and students at:

<http://medalsciences.med.unsw.edu.au/somsweb.nsf/page/Undergraduate%20Current%20Students>

'*Safety Summary for all Students and Supervisors*' is a pdf file, which can be downloaded and read from the above site. Please be informed that this site is currently being updated and will certainly be available by the beginning of TP1.

For more information on matters related to occupational and health safety policies of the UNSW visit the following web site. www.riskman.unsw.edu.au/ohs/ohs.shtml

NB. You must wear **laboratory coats** and **closed shoes** in the laboratory and bring **gloves** to all laboratory classes, especially for handling the wet and dry specimens during the Tutorial/Laboratory.

Lost Property:

You must be careful with your personal belongings at all times, it remains your responsibility. In case you have misplaced or left behind in the lab, your personal items, Anatomy manual, textbook, etc., you may check with the staff in Service Room inside the Anatomy Dissecting Room 101. Please hand in any found items to your tutor or the Service Room. However there is no guarantee that you will find what you lost, so be careful to protect your possessions. When entering the dissecting room for regular lab classes or during examination e.g. spot tests, you must bring all your belongings inside the room.

Grievances:

Grievance Procedure

See

<http://www.infonet.unsw.edu.au/poldoc/studegrv.html>

If you have any problems or grievance about this course, you should try to resolve it first with the Course Organizer/Convener. If the grievance cannot be resolved in this way, you should contact the Head of Department of Anatomy. The Grievance Officer of the School of Medical Sciences is currently:

Dr. Priti Pandey

Room G5, Wallace Worth Bldg

ph: 9385 2483

email: p.pandey@unsw.edu.au

Assessment:

1. Spot Test I: 20% Friday the 16th April 2009

From 9.0 am – 12.0 noon

(Material learnt from Wk 1 – Wk 5: Labs 1 - 4)

Please note that the test will be scheduled once only for both groups of students (doing their lab on Wednesday or Friday).

2. Spot Test II: 30% (during examination period)

(Material learnt from Wk 6 – Wk 12-13: Labs 5 - 13)

3. Final Examination: 50% (during examination period)

(Material learnt during the session: from Wk 1 – Wk 12)

Please note that in this course: The structures listed in **the class manual and workbook** (regardless whether bold or not bold) will be assessed for identification and that the gross anatomical information regarding the structure and function will be tested via theory questions within a question of the spot test. Information in the class notes is only a guide and under no circumstances indicates the total information. You must read anyone of the prescribed textbook for your factual information on the topic. Specific objectives listed under the heading of the lab/tutorial in the manual will help in outlining these topics.

NOTE:

Assessment pass mark for this course is **50%**. There are two components of this course:

- 1) The **practical component 50%** (contributed by spot test 1 and spot test 2 together) and
- 2) The **theory component 50%**.

Students are expected to pass **each component** (practical and theory) with a minimum of **50% marks**. The students, who pass overall but fail in a component (e.g., the practical or final

theory examination) will be re-examined in that component, depending on the nature and extent of the failure and performance in other components as discussed by the Course Authority and Assessment Committee. Students will be notified of their results as WD if they are required to sit for a supplementary test. Re-examination in any component for reasons of failure will be on a pass/fail basis only.

Remember it is the student's responsibility to contact the course authority in regards to the tests. Also remember it is the students responsibility to be familiar with the rules governing the conduct of examinations. **Please do not book your holidays and trips until the final results are disclosed.**

Re-examination in any component for reasons of failure will be on a pass/fail basis only. Students may lose marks for answers if the spelling of anatomical terms is unacceptable.

Spot Tests:

Spot tests contribute to 50 % of your assessment and assess the ability of the student to identify and name correctly significant structures in human anatomical specimens, models and radiographs. In addition it also examines the ability to answer relevant theory questions. Usually the marks allocated are 50% to the two parts of an individual question. The structures listed in the learning activities will be assessed for identification and the gross anatomical information regarding the structure and function is tested via theory questions within a question of the spot test. You must read the lecture notes provided and the prescribed textbook for your factual information of the topic. The atlas does help to make a visual picture with its application to the specimens and/or models. Specific objectives listed under the heading of the lab/tutorial in the manual will help in outlining these topics.

Students who fail the first spot test should consult their tutor and the course co-ordinator, for advice as soon as possible and be prepared to alter their methods of study and techniques of preparation of Tut/Lab classes.

Spot Test Instructions:

1. 12 questions, with rest seats, when/where provided (to be re-advised).
2. Each question consists of 4 - 5 identifications, followed by 2 - 3 theory questions based on the laboratory class notes.
3. Bring 2 pens (in case 1 fails); answer sheets are provided.
4. About 3.5 min. is allowed per question/rest seat; total duration of each spot test from start till finish is usually 90 min; a beeper indicates the time to move to the next question.
5. You will be instructed to put a circle around the question you are starting with, and to move to your left

- when the beeper sounds.
6. Make sure you are on the right question every time you move.
 7. Always name specifically the first structure the pin passes through or indicates.
 8. If you are uncertain, do not put any part of your answer in parentheses (“a piece of writing that wanders off from the main topic”), or put a “?” after an answer, as the answer will not be marked.
 9. Do not touch the specimens or the flags.
 10. You **must wear your lab coat and proper closed shoes** to a spot test.
 11. **Please turn your mobile phone off before you enter the dissecting room.**

PN: You must arrange to have a disposable lab coat for the day in case you have accidentally forgotten to bring one to the test.

Final theory Examination Instructions:

3 hours (during examination period)

Consists of: All the material learnt during this session and is examined by:

1. **Part A:** 50%; 3 written essay questions (10 marks each); and Question 4: 20 short answer questions; (1mark each **or** in the form of write short notes on.....
2. **Part B:** 50%; 60 multiple choice questions

4. The supplementary examinations (wherever applicable) are required to be organised in the week beginning 19th July. Provisional date for the supplementary examinations is organised as Tuesday the 20th July 2010. Failure to attend these may result in an overall fail for the student. The concerned students will be notified of the details of date, times and location and will be required to consult the Course Authority.

Be reminded that the UNSW regards the academic misconduct as a very serious matter. All students should be familiar with the University’s Academic Misconduct Policy available at <https://my.unsw.edu.au/student/academiclife/assessment/examinations/AcademicMisconduct.html>

Course and teaching evaluation improvement (CATEI)

The student evaluative feedback on the course is gathered, using UNSW’s Course and Teaching Evaluation and Improvement (CATEI) Process. There will be three forms that the students will be requested to fill in towards the end of the semester. These questionnaires are available on-line as well as on paper. Depending on the availability of time the students will be advised in time and will be requested to provide feedback on the course (Form A) and the teachers (lecturer (form B) and tutor/demonstrator (Form C)). Student feedback

is taken seriously, and continual improvements are made to the course based in part on such feedback.

Every year student evaluations are conducted and the student responses and comments are collected to look for constructive suggestions regarding improvements in the course and large & small group teaching.

CATEI 2009: *A brief summary is provided for your information.*

FORM A: course evaluation

- The aim of this course was clear to me: 85% students agreed
- The course was challenging and interesting: 92.4% students agreed
- The assessment methods and tasks in this course were appropriate given the course aims: 81% students agreed
- Overall I was satisfied with the quality of this course: 75% students agreed.

FORM B: large group teaching

- This lecturer communicated effectively with students: 89% students agreed
- This lecturer encouraged me to think critically: 93% students agreed
- This lecturer encouraged student input and participation during classes: 95%
- This lecturer is generally helpful to students: 96% students agreed
- This lecturer provides enough opportunities to ask questions: 98% students agreed.
- Overall I was satisfied with the quality of this lecturer's teaching: 92% students agreed

FORM C: Small group teaching

- Evaluation questionnaire student responses to this aspect of individual teachers evaluation, is not available to share but overall students were happy with their tutors.

Acknowledgements:

The notes that follow in this manual have been revised and extensively modified from the original notes, received with thanks, from Prof. DJ Tracey (2006).

The drawings that are included in this workbook are hand-drawn by Dr. Pandey and are included here to promote the visual learning process.

Although best care and attention has been aimed at the preparation of these notes, there may be some shortcomings in the perfection of the written presentation. A positive and constructive feedback on behalf of the students and readers will be very much appreciated for further and future improvements.

Dr. P. Pandey

Course–Convener and Lecturer-in-charge

ANAT3131, 08/02/2010

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 laboratory **coat** before you enter the lab;
 - if you have forgotten to bring the lab coat for the day, the disposable lab coat can be bought from the Union shop in the Mathew's arcade.
 - wear covered **shoes**, not thongs;
 - wear latex or vinyl **gloves** when touching wet specimens (gloves are available from Union Arcade Shop);
 - never put anything in your **mouth**, e.g., biros or pencils that you may have picked up 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 microchipped for identification and record keeping.
8. **Preservative solution.** Most anatomy specimens are stored in 2% phenoxy ethanol, which is classified as non-toxic. You should always wear gloves when handling specimens. Detailed information about phenoxy ethanol 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. Moreover, 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. **First Aid from Room 101B.**
9. Revision Facilities are available in the Anatomy Museum Room 105. Please do not remove the museum jars from their shelves.

(Revised PP 2007 from BF: 11/02)

Provisional Lectures & Practical Laboratory Time Table, 2010

| Week | Day | Date | Topics of Lecture & Practical Laboratory |
|--|-----|------|--|
| 1 | | | |
| Lect | Mon | 01/3 | 1. SHOULDER GIRDLE AND JOINTS |
| | Tue | 02/3 | 2. FUNCTIONAL ANATOMY OF THE SHOULDER & ARM |
| Lab | Thu | 04/3 | NO LAB |
| | Fri | 05/3 | |
| 2 | | | |
| Lect | Mon | 08/3 | 3. THE ELBOW JOINT & JOINTS OF PRONATION AND SUPINATION |
| | Tue | 09/3 | 4. MUSCULOSKELETAL ANATOMY OF THE FOREARM |
| Lab | Thu | 11/3 | Lab 1: SHOULDER JOINT & MUSCULOSKELETAL ANATOMY OF THE ARM |
| | Fri | 12/3 | |
| 3 | | | |
| Lect | Mon | 15/3 | 5. WRIST JOINT AND JOINTS OF HAND AND FINGERS |
| | Tue | 16/3 | 6. MUSCLES PRODUCING THE MOVEMENTS OF WRIST AND HAND |
| Lab | Thu | 18/3 | Lab 2: ELBOW JOINT & MUSCULOSKELETAL ANATOMY OF THE FOREARM |
| | Fri | 19/3 | |
| 4 | | | |
| Lect | Mon | 22/3 | 7. BIOMECHANICS OF BONE, CARTILAGE AND LIGAMENT |
| | Tue | 23/3 | 8. AXILLA AND BLOOD SUPPLY OF THE UPPER LIMB |
| Lab | Thu | 25/3 | Lab 3: WRIST JOINT & MUSCULOSKELETAL ANATOMY OF THE HAND |
| | Fri | 26/3 | |
| 5 | | | |
| Lect | Mon | | 9. SURFACE ANATOMY OF THE UPPER LIMB (VIDEO) |
| | Tue | 02/4 | 10. BRACHIAL PLEXUS |
| Lab | | | <i>For both groups: Group 1 (9.00-11.00am) and Group 2 (11-1.00pm)</i> |
| | Thu | 01/4 | Lab 4: AXILLA AND BLOOD SUPPLY OF THE UPPER LIMB |
| | Fri | 02/4 | EASTER FRIDAY: NO LAB |
| MIDSESSION RECESS 02 APRIL – 11 APRIL | | | |
| 6 | | | |
| Lect | Mon | 12/4 | 11. NERVE SUPPLY OF THE UPPER LIMB |
| | Tue | 13/4 | 12. TROUBLESHOOTING IN THE LECTURE |
| Lab | Thu | 15/4 | Lab 5: REVISION AND TRIAL SPOT TEST <i>For both groups: Group 1 (9.00-11.00am) and Group 2 (11-1.00pm)</i> |
| | Fri | 16/4 | |

| | | | |
|-------------|------------|-------------|--|
| 7 | | | |
| Lect | Mon | 19/4 | 13. CLINICAL ANATOMY AND NERVE ROOT LESIONS OF THE UPPER LIMB |
| | Tue | 20/4 | 14. THE SKULL |
| Lab | Thu | 22/4 | Lab 6: BRACHIAL PLEXUS & NERVES OF THE UPPER LIMB |
| | Fri | 23/4 | |
| 8 | | | |
| Lect | Mon | 26/4 | NO LECTURE, ANZAC DAY |
| | Tue | 27/4 | 15. TEMPOROMANDIBULAR JOINT |
| Lab | Thu | 29/4 | Lab 7: THE SKULL, TMJ AND ASSOCIATED MUSCULOSKELETAL ANATOMY |
| | Fri | 30/4 | |
| 9 | | | |
| Lect | Mon | 03/5 | 16. THE FACE AND SCALP |
| | Tue | 04/5 | 17. HYOID AND ASSOCIATED MUSCULOSKELETAL ANATOMY |
| Lab | Thu | 06/5 | Lab 8: FACE, SCALP, HYOID AND ASSOCIATED MUSCULOSKELETAL ANATOMY |
| | Fri | 07/5 | |
| 10 | | | |
| Lect | Mon | 10/5 | 18. BLOOD VESSELS OF HEAD, NECK AND FACE I |
| | Tue | 11/5 | 19. BLOOD VESSELS OF HEAD, NECK AND FACE II |
| Lab | Thu | 13/5 | Lab 9: BLOOD VESSELS OF HEAD, NECK AND FACE |
| | Fri | 14/5 | |
| 11 | | | |
| Lect | Mon | 17/5 | 20. NERVE SUPPLY OF HEAD, NECK AND FACE I |
| | Tue | 18/5 | 21. NERVE SUPPLY OF HEAD, NECK AND FACE II |
| Lab | Thu | 20/5 | Lab 10: NERVE SUPPLY OF HEAD, NECK AND FACE |
| | Fri | 21/5 | |
| 12 | | | |
| Lect | Mon | 24/5 | 22. CLINICAL ANATOMY HEAD, NECK AND FACE |
| | Tue | 25/5 | 23. BIOMECHANICS OF MUSCLE AND TENDON |
| Lab | Thu | 27/5 | Lab 11: SURFACE ANATOMY OF HEAD, NECK AND FACE; TUTORIAL, TROUBLESHOOTING OF UPPER LIMB |
| | Fri | 28/5 | |
| 13 | | | |
| Lect | Mon | 31/5 | NO LECTURE |
| | Tue | 01/6 | NO LECTURE |
| Lab | Thu | 03/6 | Lab 12: REVISION HEAD, NECK AND FACE |
| | Fri | 04/6 | |

Student vacation: 5th June – 10th June

SPOT TEST 2, 30%; (Material learnt from Wk 6- Wk 12-13)

(During examination period)

Examination period: 11th June – 28th June

Mid-year recess: 29th June- 19th July

**SUPPLEMENTARY EXAMINATIONS (if and when applicable):
TUESDAY THE 20TH JULY (Timetable and venues will be announced
closer to the event).**

Functional Anatomy I (ANAT 3131) Overview of the Lecture topics

The aim of this course is to present musculoskeletal anatomy with a functional emphasis. This year it also includes the Biomechanics of Bone, cartilage & ligaments and muscle and tendon. Please note that these notes below do not indicate the order or topics of lectures but mainly indicate the regions and synopsis of the topics within the region.

1. Shoulder joint, joints of shoulder girdle and musculoskeletal anatomy of the Arm.

- The bones and joints of clavicle and shoulder girdle.
- Movements of the sternoclavicular and acromioclavicular joints; function of the costoclavicular and coracoclavicular ligaments.
- Review of muscles operating at the shoulder girdle: scapular mm., muscles connecting upper limb and vertebral column, and muscles connecting upper limb and thoracic wall.
- Actions and innervations of these muscles.
- Movements of the shoulder girdle: glenohumeral and scapular movements.
- Relative involvement of movements of the scapula and humerus in abduction. These synchronised movements are often termed the “**scapular rhythm**”.
- Lines of action of the scapular muscles.
- Lines of action of the muscles of the arm.
- Clinical anatomy: Common disorders of the shoulder and arm.

2. Elbow joint and musculoskeletal anatomy of the forearm.

- Bones and joints of elbow and forearm; the joints involved in the movement of pronation and supination.
- Identification of gross features and articular surfaces of humerus, radius and ulna.
- Identify the muscles operating at the elbow and radioulnar joints.
- Muscles of the arm and forearm: flexion at elbow produced by biceps brachii, brachialis and brachioradialis. Flexion produced by biceps and brachioradialis depends on degree of supination. Elbow extensors: includes triceps brachii and the anconeus. Supination of forearm is produced by biceps brachii primarily with supinator muscle; and pronation of forearm is produced by pronator teres & pronator quadratus muscles.
- Cubital fossa: its boundaries, contents and clinical relevance.
- Clinical anatomy and Common disorders of the elbow and forearm.

3. Wrist joint and musculoskeletal anatomy of the forearm and hand.

- Major gross features of the carpals, metacarpal and phalanges: bones and their articular surfaces.
- Carpal joints: radiocarpal and midcarpal joints.
- Movements and ligaments of the wrist.
- Carpometacarpal joints of fingers and thumb.
- Metacarpophalangeal joints; collateral ligaments, palmar fibrocartilage plate, and deep transverse metacarpal ligaments.
- Digital fibrous flexor and synovial sheaths. Interphalangeal joints and ligaments.
- Phalanges and their muscular attachments.
- Insertions of extrinsic flexor and extensor muscles; dorsal digital expansion.
- Extrinsic muscles of the wrist and hand: Muscles of forearm and wrist.

- Deep and superficial flexors, their attachments and innervation
- Deep extensors, including “outcropping” muscles of thumb.
- Superficial extensors: lateral and posterior groups. Extensor retinaculum.
- Intrinsic muscles of the hand: thenar and hypothenar muscles, adductor pollicis, lumbricals and palmar & dorsal interossei. Actions and innervation of intrinsic muscles.
- Discuss the power grip, precision grip and hook grip.
- Clinical anatomy and Common disorders of the wrist and hand. Flexor & extensor retinaculum, and the carpal tunnel. Carpal tunnel syndrome and RSI. Anatomical snuffbox.

4. **Axilla, Vessels and lymphatics of upper limb.**

- Gross anatomy of the axilla.
- Subclavian, axillary, brachial, radial and ulnar arteries, their course and major branches.
- Anastomosis at the elbow.
- The palmar arches and digital arteries.
- Venous drainage of the upper limb: Superficial veins and deep veins.
- Axillary lymph nodes and area of drainage.

5. **Brachial plexus and peripheral nerves of the upper limb.**

- Review the gross anatomy of axilla.
- Identify the ventral rami of the spinal nerves (C5 – C8 and T1) and the formation of brachial plexus. Know its organization into rami, trunks, divisions, cords and terminal branches.
- Relations of cords with second part of axillary artery. Terminal branches. Side branches from the rami, upper trunk and cords. Posterior triangle and axilla. Nerve Blocks of the brachial plexus for purposes of anaesthesia.
- Clinical anatomy: Results of injury to upper and lower brachial plexus.

6. **Nerves of upper limb.**

- Median, ulnar and musculocutaneous nerves; course and distribution; muscular and cutaneous branches.
- Radial & axillary nerves; course & distribution; muscular & cutaneous branches.
- Identify the dermatomes and the area of skin supplied by the major nerves of the brachial plexus.
- Clinical anatomy: Results of lesion of peripheral nerves.

7. **Clinical anatomy, nerve and nerve root lesions of the upper limb**

- Revise Clinical anatomy: Results of lesion of peripheral nerves.
- Discuss the clinical problems listed in the manual and explain the injury and symptoms & signs in the patient.
- Revise clinical problems associated with the musculoskeletal, nervous and/or vascular elements of the shoulder girdle and upper limb.

8. **Living and palpatory anatomy of the upper limb**

- **Surface Anatomy** is the study of living body at rest and in action and is used in all three approaches (regional, systemic, and clinical). The main aim of surface/living anatomy is to visualise the structures that lie under the skin.

9. **Biomechanics of bone, cartilage and ligament.**

- Describe the different types of forces to which biological materials are subjected and relate these different types of forces to loads experienced during different activities of human movement
- Have a basic familiarity with the terminology of the field of solid mechanics to be able to understand the literature relating to the biomechanics of human tissues
- Recall the structure and developmental processes of bone
- Describe the mechanical properties of bone
- Describe the adaptations in bone to mechanical loading
- Understand that the benefit of exercise for maintaining and developing bone mass will depend on the type of exercise
- Describe the changes in bone with ageing & disuse
- Appreciate the reduced tolerance of mechanical loading for people recovering from bone fractures
- Describe the structure of cartilage and ligament
- Describe the mechanical properties of cartilage and ligament
- Describe the adaptations of cartilage and ligament to mechanical loading
- Describe the changes in cartilage & ligament with exercise, ageing, disuse and injury
- Appreciate that different joint orientations will place different strains on cartilage and ligaments
- Appreciate that this will result in cartilage or ligament operating in a different region of the stress-strain curves for that tissue OR having a different stress-strain curve
- Appreciate that the stress-strain curves for a tissue can be altered during recovery from injury
- Appreciate that both these factors should be considered for the design of exercise rehabilitation programs

10. **Skull.**

- Gross anatomy of the skull; Major bones, joints and sutures of the skull in various views e.g. superior, posterior, frontal, lateral and inferior aspects;
- Including parts of the temporal, sphenoid and occipital bones.
- Cranial cavity with anterior, middle and posterior cranial fossae.
- Major Foramina and structures passing through these.
- Fractures of the skull,
- Elasticity of the skull at birth.

11. **Temporomandibular joint (TMJ) and associated musculoskeletal anatomy of mastication.**

- Mandible; its bony features and muscle attachments.
- The mandibular fossa and articular tubercle of the temporal bone.
- Temporomandibular joint, with its articular disc, capsule and ligaments. Compartments of TMJ.
- Movements of mandible.
- Muscles of mastication, their attachments and lines of action.
- Clinical anatomy

12. **Scalp and face.**

- Layers of the scalp.
- Cutaneous nerve supply of scalp. Nose and ear and their innervation.
- Bones of the facial skeleton

- Major Muscles of facial expression and their actions.
- Innervation by facial nerve and its branches.
- Lesions of the facial nerve.
- The hyoid muscles; suprahyoid and infrahyoid muscles. Innervation and function of these muscles.

13. Blood vessels of head & neck.

- The blood supply to the face and scalp via the branches of external carotid artery.
- Venous drainage of face by external jugular vein
- The internal jugular vein

14. Nerve supply of head, neck & face.

- Review of trigeminal nerves, its divisions: ophthalmic, maxillary and mandibular.
- Clinical anatomy: trigeminal neuralgia.
- Review of the facial nerve and its branches,

15. Clinical anatomy.

- Facial nerve palsy, Bell's Palsy
- Injuries and clinical conditions associated with distribution of the trigeminal nerve.
- The cervical plexus and ansa cervicalis.
- Horner's syndrome

16. Biomechanics of muscle and tendon.

- Describe the structure and mechanical properties of tendon and the muscle-tendon junction
- Describe the adaptations of tendon to:
 - Mechanical loading / exercise
 - Disuse
 - Ageing
 - Injury
- Understand the basic processes of
 - Tendinitis
 - Muscle strain
 - Nerve impingement

17. Living and palpatory anatomy of head, neck & face: Surface Anatomy is the study of living body at rest and in action and is used in all three approaches (regional, systemic, and clinical). The main aim of surface/living anatomy is to visualise the structures that lie under the skin.

18. Radiological anatomy: Note that these are incorporated through out the various lab classes during the session. Principles of radiology. Basic principles of interpretation of plane x-rays in terms of the chief radiographic densities, i.e. gas, fat, water or soft tissue, bone, calcium, heavy metal. Other imaging techniques such as ultrasound, C.T. scanning, M.R.I. scanning, and P.E.T. scan.

19. Sectional anatomy of the upper limb: This will also be incorporated within different labs and note that it provides the best possible learning tool for spatial relationship of various structures within a region.

Reviewed and Revised 08/02/2010

Dr. Pandey

Course convener and Lecturer-in-Charge