Faculty of Medicine & Health

School of Medical Sciences

ANAT 2241

Histology: Basic and Systematic

COURSE OUTLINE

Term 2, 2021

CRICOS Provider Code 00098G

Contents

Please read this outline in conjunction with the following pages on the School of Medical Sciences website:

- Advice for Students
- Learning Resources

Student Policy/resource Information can be found on https://medicalsciences.med.unsw.edu.au/students/undergraduate/advice-students

Special Consideration is centralised and can be found on:

https://student.unsw.edu.au/special-consideration

STAFF

COURSE ACADEMIC TEAM:

Dr Annemiek Beverdam (convener)

A.Beverdam@unsw.edu.au

Room 234, Second Floor, Wallace Wurth Building

Tel: 9385 0019

Dr Reza Shirazi (co-convener)

Reza.Shirazi@unsw.edu.au

Room 215, Second Floor, Wallace Wurth Building

Tel: 9348 0138

UNITS OF CREDIT

ANAT2241 Histology: Basic and Systematic is a 6UOC course. It is offered in the Anatomy major in the BSc and BMedSci programs. As a pre-requisite to PATH2201 Processes in Disease, it provides a dynamic link to the study of disorders when examined microscopically. Students need to understand normal histological morphology of cells, tissues and organs before they can appreciate pathological conditions of tissues under the virtual microscope.

MODIFICATIONS TO THE COURSE FROM 2020

In 2020, the course was delivered fully online by the course academic team. This year the online lectures have been thoroughly revised and improved. Furthermore, there will be increased flexibility for students to attend multimodal learning activities. Lectures and the first practical class will be delivered synchronously online, whereas the second practical class will be offered both synchronous online and on campus on two different days.

COURSE AIM AND LEARNING OUTCOMES

The aim of this course is to provide students with a comprehensive understanding of the microscopic structure (appearance) and function of normal organs and tissues in the human body. The knowledge of microscopic structures attained in this course can be integrated by students with other subdisciplines of anatomy (macroscopic or gross anatomy, and embryology) and the related biomedical science disciplines such as Pathology and Physiology. The main aims of the course are to:

1. Demonstrate the appropriate use of histological terminology and an understanding of the basic histological tissues.
2. Demonstrate an understanding of the microscopic structure and function of the basic tissues, namely epithelium, connective tissue, muscle and nervous tissue.

3. Demonstrate an understanding of the microscopic structure and function of the following human body systems and their components: cardiovascular, respiratory, integumentary, immune, gastro-intestinal, endocrine, urinary, and male and female reproductive systems.
4. Demonstrate an understanding of the interdependence of body systems from histological structure.

HISTOLOGY BACKGROUND

Anatomy is the study of the structure of human body**.** Macroscopic (gross) anatomy examines the relations of body systems and organs topographically and relative to each other. In **histology**, the organs and tissues that constitute these organs are examined at a microscopic level - it can therefore be considered as microanatomy. Histology provides an insight into how cellular components are structurally and functionally related. It draws its foundations in Biochemistry, Molecular Biology and Physiology as well as Gross Anatomy.

Histology is one of the fundamental biomedical sciences. Histology provides valuable information on why tissues and organs are shaped as they are. Modern histological techniques allow us to explore and gain an understanding of biochemical and physiological processes and how these are changed when structure is altered, as occurs, for instance, in many disease processes, and ageing.

RESOURCES

RECOMMENDED TEXTS *One of these books will be indispensable to your learning!*

Pawlina W. 2018. Histology: A Text and Atlas. 8th edition. Wolters Kluwer

Junqueira's *Basic Histology:* Text & Atlas 15th ed, McGraw-Hill

Mescher AL. 2018.

WEBSITES

University of Michigan Histology: https://histology.medicine.umich.edu/resources

Virtual Microscopy Database (VMD): http://virtualmicroscopydatabase.org/

Histology Guide (Brelje and Sorenson): http://www.histologyguide.com/index.html

UNSW Virtual Slides
Link in the Course Moodle page

ASSESSMENTS

1. Continuous Assessment

These are 5 short quizzes (weeks 2, 5, 7, 8, 9) based on images and on theoretical content of a topic, taken remotely, which combined are worth **30%.** These quizzes provide students with regular feedback on their mastery of each topic. The assessment is conducted online.

Feedback process: Feedback will be provided through Moodle.

2. Assessment Task (mid-term, Monday 21 June 2021)

This mid-term assessment task is worth **20%.** It integrates practical knowledge of tissues (identifying structures on microscopy images) and theoretical knowledge. The assessment is conducted online.

Feedback process: Feedback will be provided through Moodle.

3. Assessment Task (end-term, Monday 2 August 2021)

The end-term assessment task is worth **20%.** It integrates practical knowledge of tissues (identifying structures on microscopy images) and theoretical knowledge. The assessment is conducted online.

Feedback process: Feedback will be provided through Moodle.

4. Final Theory Exam

A single final course exam will be held during the formal examination period. This assesses student's mastery of the course content and ability to apply this knowledge to functional and clinical contexts through problem-solving. This exam is worth **30%.**

- Final exam period for Term 2, 2021 is Friday, 13 Aug to Thursday, 26 Aug
- Supplementary exam period for Term 2, 2021 is Monday, 6 September to Friday, 10 September.

STUDENT RESOURCES AND REVISION FACILITIES

- Key Dates https://student.unsw.edu.au/dates
- Transitioning to Online Learning https://www.covid19studyonline.unsw.edu.au/
- Guide to Online Study https://student.unsw.edu.au/online-study
- UNSW Student Life Hub https://student.unsw.edu.au/hub#main-content
- Student Support and Development https://student.unsw.edu.au/support
- IT, eLearning and Apps https://student.unsw.edu.au/elearning
- Student Support and Success Advisors https://student.unsw.edu.au/advisors
- Disability Support Services or Equitable Learning Services: https://student.unsw.edu.au/els
- Special Consideration: https://student.unsw.edu.au/special-consideration

GENERAL ADVICE IN HISTOLOGY

In Histology, you are expected to study the features of histological preparations as virtual images, which were scanned from real stained tissue sections and then mounted on glass slides. Histological sections are slices of tissue usually of 5-8μm thick (see Dimensions). Our histological collection is made available to you digitally. Histology is a visually beautiful sub-discipline of anatomy!

A useful study technique for learning histology is to draw schematic illustrations of the histological slides presented to you, and to annotate these**.** Note the 2D shapes in the section and the major tissue components present and try to determine the approximate 3-D shape of the whole organ from which the section was taken. Is the section cut randomly through the organ? Is there an obvious lumen in the section?

Some useful things to remember when studying histology:

- **Abbreviations:**
  - XS – cross section
  - TS – transverse section
  - LS – longitudinal section
  - LM – light microscope or light micrograph
  - EM – electron microscope, or electron micrograph

- **Scale:**
  - 1mm = 10^3 micrometres (μm) = 10^6 nanometres (nm)
  - A micrometre is often called a “micron” (μm); 1μm = 10^{-6}m

- **Resolving Powers:**
  - Unaided eye – approx. 0.1 mm = 100μm
  - Light microscope – approx. 0.1 μm = 100nm
  - Electron microscope – approx. 1 nm

TIMETABLE

In 2021, the course will be delivered synchronously, both online via teams and face-to-face on campus. There will be 2 synchronous online lectures and one online 2-hour practical class on Monday, and a second 2-hour practical class that will be offered both online and on campus on Tuesday and Thursday. Practical classes are mandatory, but students can select the best day and mode of delivery for them. There will also be a weekly formative online quiz that students can complete to test their understanding of the topics taught during week.

The course is broken into 18 short modules that are delivered over 10 weeks:

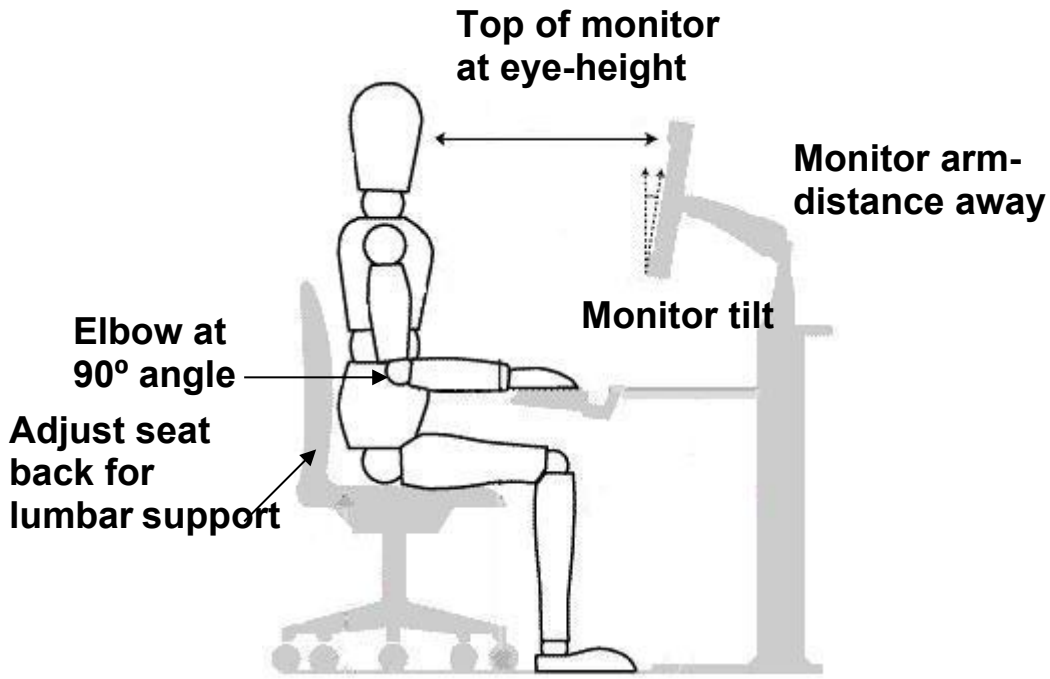
Week	Module		Lecture (Monday 10 am - 12 pm)	Delivery by	Online practical class (Monday 3-5 pm)	Dual Mode Practical Class	Tuesday 10 am - 12 pm		Thursday 11 am - 1 pm		Formative Online Activities
0			Pre-course preparation modules	Moodle							
1	1	Basic histology	Introduction	Annemiek and Reza	Epithelial tissues and Glands	Epithelial tissues and Glands	UNSW	Annemiek	UNSW	Reza	Epithelial tissues and Glands
	2	Basic histology	Epithelial tissues and Glands	Annemiek			Online	Reza	Online	Annemiek	
2	3	Basic histology	Connective tissue	Reza	**QUIZ 1** - Connective Tissue, Cartilage and Bone	Connective Tissue, Cartilage and Bone	UNSW	Reza	UNSW	Annemiek	Connective Tissue, Cartilage and Bone
	4	Basic histology	Cartilage and Bone	Annemiek			Online	Annemiek	Online	Reza	
3	5	Basic histology	Muscle Tissue	Annemiek	No practical class due to Public Holiday	Muscle and Nervous Tissue - Basic Tissue Playground	UNSW	Annemiek	UNSW	Reza	Muscle and Nervous Tissue
	6	Basic histology	Nervous Tissue	Annemiek			Online	Reza	Online	Annemiek	
4	7	Systems Histology	CNS and PNS	Reza	**Midterm Exam: Basic Histology**	CNS, PNS and Integumentary System	UNSW	Reza	UNSW	Annemiek	PNS, CNS and Integumentary System
	8	Systems Histology	Integumentary system	Annemiek	CNS, PNS, Integumentary System		Online	Annemiek	Online	Reza	
5	9	Systems Histology	Blood and Immune System	Annemiek	**QUIZ 2** - Blood, Immune and Cardiovascular Systems	Blood, Immune and Cardiovascular Systems	UNSW	Annemiek	UNSW	Reza	Blood, Immune and Cardiovascular System
	10	Systems Histology	Cardiovascular system	Reza			Online	Reza	Online	Annemiek	
6	**Study week**										
7	11	Systems Histology	Upper GIT	Annemiek	**QUIZ 3** and GIT	GIT	UNSW	Reza	UNSW	Annemiek	GIT
	12	Systems Histology	Lower GIT	Reza			Online	Annemiek	Online	Reza	
8	13	Systems Histology	Respiratory system	Reza	**QUIZ 4** - Respiratory and Sensory Systems	Respiratory and Sensory Systems	UNSW	Annemiek	UNSW	Reza	Respiratory and Sensory Systems
	14	Systems Histology	Sensory System	Reza			Online	Reza	Online	Annemiek	
9	15	Systems Histology	Male reproductive system	Annemiek	**QUIZ 5** - Reproductive Systems	Reproductive Systems	UNSW	Reza	UNSW	Annemiek	Reproductive Systems
	16	Systems Histology	Female reproductive system	Reza			Online	Annemiek	Online	Reza	
10	17	Systems Histology	Urinary system	Annemiek	**End of Term Exam**	Endocrine and Urinary Systems	UNSW	Annemiek	UNSW	Reza	Endocrine and Urinary Systems
	18	Systems Histology	Endocrine system	Reza	Endocrine and Urinary Systems		Online	Reza	Online	Annemiek	

CENSUS date is Week 4: Sunday 27 June 2021.

Medicine and Science Teaching Laboratory Student Risk Assessment	UNSW SYDNEY	Histology/Embryology Practical Classes for Medicine and Science Students Wallace Wurth Building G06/07

Hazards	Risks	Controls
Ergonomics	Musculoskeletal pain	• Correct workstation set-up • Check electrical equipment is in good condition before use • All portable electrical equipment tested and tagged • Disinfectants and wipes available for use before and after the practical
Electrical	Electrical shock/Fire	
Biological	Infection	

Workstation set-up



Personal Protective Equipment

Not necessary in these practicals. *Face masks may be required.*

Emergency Procedures

In the event of an alarm, follow the instructions of the demonstrator. The initial sound (beep) is advising you to prepare for evacuation and during this time start packing up your things. The second

sound (whoop) gives instruction to leave. The Wallace Wurth assembly point is on the lawn in front of the Chancellery. In the event of an injury inform the demonstrator (and/or lab staff). First aider and fire warden contact details are on display by the lifts. There is a wall mounted First Aid Kit located at the end of the G06 Laboratory.

Clean up and waste disposal

No apparatus or chemicals used in these practicals.

Declaration

I have read and understand the safety requirements for this practical class, and I will observe these requirements.

Signature:…… **Date**:……

Student number: .....