ANAT 2241
Histology: Basic and Systematic

COURSE OUTLINE

Term 2, 2021
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAFF</td>
<td>3</td>
</tr>
<tr>
<td>UNITS OF CREDIT</td>
<td>3</td>
</tr>
<tr>
<td>COURSE AIM AND LEARNING OUTCOMES</td>
<td>3</td>
</tr>
<tr>
<td>HISTOLOGY BACKGROUND</td>
<td>4</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>4</td>
</tr>
<tr>
<td>ASSESSMENTS</td>
<td>5</td>
</tr>
<tr>
<td>STUDENT RESOURCES AND REVISION FACILITIES</td>
<td>5</td>
</tr>
<tr>
<td>GENERAL ADVICE IN HISTOLOGY</td>
<td>6</td>
</tr>
<tr>
<td>TIMETABLE</td>
<td>7</td>
</tr>
</tbody>
</table>

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

- [Advice for Students](https://medicalsciences.med.unsw.edu.au/students/undergraduate/advice-students)
- [Learning Resources](https://medicalsciences.med.unsw.edu.au/students/undergraduate/advice-students)

Student Policy/resource Information can be found on [https://medicalsciences.med.unsw.edu.au/students/undergraduate/advice-students](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](https://student.unsw.edu.au/special-consideration)
STAFF

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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!


Mescher AL. 2018.

WEBSITES

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

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


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

<table>
<thead>
<tr>
<th>Week</th>
<th>Module</th>
<th>Lecture (Monday 10 am - 12 pm)</th>
<th>Delivery by</th>
<th>Online practical class (Monday 3-5 pm)</th>
<th>Dual Mode Practical Class</th>
<th>Tuesday 10 am - 12 pm</th>
<th>Thursday 11 am - 1 pm</th>
<th>Formative Online Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Pre-course preparation modules</td>
<td>Blood</td>
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<tr>
<td>1</td>
<td>1</td>
<td>Basic histology Introduction</td>
<td>Amersham</td>
<td>Epithelial tissues and Glands</td>
<td>Epithelial tissues and Glands</td>
<td>UNSW Amersham UNSW</td>
<td>UNSW/Amersham</td>
<td></td>
</tr>
<tr>
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<td>2</td>
<td>Basic histology Epithelial tissues and Glands Amersham</td>
<td>Epithelial tissues and Glands</td>
<td>Amersham</td>
<td>Epithelial tissues and Glands</td>
<td>UNSW/Amersham</td>
<td>UNSW/Amersham</td>
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<tr>
<td>2</td>
<td>3</td>
<td>Basic histology Connective tissue</td>
<td>Reza</td>
<td>Quiz 1 Connective Tissue, Cartilage and Bone</td>
<td>Connective Tissue, Cartilage and Bone</td>
<td>UNSW Reza UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Connective Tissue, Cartilage and Bone</td>
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<tr>
<td>2</td>
<td>4</td>
<td>Basic histology Connective tissue and bone</td>
<td>Amersham</td>
<td>Quiz 1 Connective Tissue, Cartilage and Bone</td>
<td>Connective Tissue, Cartilage and Bone</td>
<td>UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Connective Tissue, Cartilage and Bone</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Basic histology Muscle Tissue</td>
<td>Amersham</td>
<td>Quiz 2 Muscle and Nervous Tissue Basic Tissue Placement</td>
<td>Muscle and Nervous Tissue Basic Tissue Placement</td>
<td>UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Muscle and Nervous Tissue Basic Tissue Placement</td>
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<tr>
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<td>6</td>
<td>Basic histology Nervous Tissue</td>
<td>Amersham</td>
<td>Quiz 2 Muscle and Nervous Tissue Basic Tissue Placement</td>
<td>Muscle and Nervous Tissue Basic Tissue Placement</td>
<td>UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Muscle and Nervous Tissue Basic Tissue Placement</td>
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<td>Systems histology CNS and PNS</td>
<td>Reza</td>
<td>Midterm Exam: Basic Histology</td>
<td>CNS, PNS, Integumentary System</td>
<td>UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>CNS, PNS, Integumentary System</td>
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<td>Systems histology Integumentary system</td>
<td>Amersham</td>
<td>Midterm Exam: Basic Histology</td>
<td>CNS, PNS, Integumentary System</td>
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<td>UNSW Amersham</td>
<td>CNS, PNS, Integumentary System</td>
</tr>
<tr>
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<td>9</td>
<td>Systems histology Blood and Immune system</td>
<td>Amersham</td>
<td>Quiz 2 Blood, Immune and Cardiovascular Systems</td>
<td>Blood, Immune and Cardiovascular Systems</td>
<td>UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Blood, Immune and Cardiovascular Systems</td>
</tr>
<tr>
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<td>Systems histology Cardiovascular system</td>
<td>Reza</td>
<td>Quiz 2 Blood, Immune and Cardiovascular Systems</td>
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<td>UNSW Amersham</td>
<td>Blood, Immune and Cardiovascular Systems</td>
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<td>Systems histology Upper GIT</td>
<td>Amersham</td>
<td>Quiz 3 and GIT</td>
<td>GIT</td>
<td>UNSW/Amersham</td>
<td>UNSW/Amersham</td>
<td>GIT</td>
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<tr>
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<td>Systems histology Lower GIT</td>
<td>Reza</td>
<td>Quiz 3 and GIT</td>
<td>GIT</td>
<td>UNSW/Amersham</td>
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<td>GIT</td>
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<td>Systems histology Respiratory system</td>
<td>Reza</td>
<td>Quiz 4 - Respiratory and Sensory Systems</td>
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<td>Respiratory and Sensory Systems</td>
</tr>
<tr>
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<td>14</td>
<td>Systems histology Sensory system</td>
<td>Reza</td>
<td>Quiz 4 - Respiratory and Sensory Systems</td>
<td>Respiratory and Sensory Systems</td>
<td>UNSW/Amersham</td>
<td>UNSW/Amersham</td>
<td>Respiratory and Sensory Systems</td>
</tr>
<tr>
<td>9</td>
<td>15</td>
<td>Systems histology Male reproductive system</td>
<td>Amersham</td>
<td>Quiz 5 - Reproductive Systems</td>
<td>Reproductive Systems</td>
<td>UNSW Reza UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Reproductive Systems</td>
</tr>
<tr>
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<td>16</td>
<td>Systems histology Female reproductive system</td>
<td>Reza</td>
<td>Quiz 5 - Reproductive Systems</td>
<td>Reproductive Systems</td>
<td>UNSW Reza UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Reproductive Systems</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>Systems histology Urinary system</td>
<td>Amersham</td>
<td>End of Term Exam</td>
<td>Endocrine and Urinary Systems</td>
<td>UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Endocrine and Urinary Systems</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
<td>Systems histology Endocrine system</td>
<td>Reza</td>
<td>Endocrine and Urinary Systems</td>
<td>Endocrine and Urinary Systems</td>
<td>UNSW Reza UNSW Amersham</td>
<td>UNSW Amersham</td>
<td>Endocrine and Urinary Systems</td>
</tr>
</tbody>
</table>

CENSUS date is Week 4: Sunday 27 June 2021.
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: ..........................................................