HISTOPATHOLOGY 333 Semester 1: 2012

Unit Index No: 311413
Credit points: 25 credit points awarded on successful completion of this unit.
Pre-requisite Units: Histopathology 233/234, Pathology 232
Unit Coordinator: Associate Professor Vincent Williams
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Please read this outline fully before commencing your study in this unit

Outcomes
Completion of the HISTOPATHOLOGY 333 unit will result in the following:
1. Competency in processing, and paraffin embedding tissue for sectioning and staining for microscopic diagnosis using a range of special staining methods.

2. Practical understanding of surgical dissection methods appropriate to a range of human tissues including laboratory accession processes, recording of macroscopic features and tissue selection for microscopic diagnosis

3. An understanding of and an ability to recognise the diagnostic microscopic features in normal tissues and in a range of pathological tissues using routine H&E and special stains.
Proficiency in cutting frozen sections for rapid H&E and histochemistry.

**Aims and syllabus summary**

Histopathology is the study of abnormal changes in tissue resulting from injury caused by many things including trauma, infection, immune reactions, genetic aberrations and neoplasia. Histopathology forms one of the arms of Anatomical Pathology (AP) together with Diagnostic Cytopathology and Morbid Anatomy. The recognition and diagnosis of pathological changes in tissues from surgery and post-mortem is dependent on the skill of histologists in preparing microscopic samples for assessment.

The aims of this course are to provide students with an understanding of the role of the histologist in the contemporary AP laboratory. Students will be taught the fundamental principles of pathology that will provide an appreciation of the rationale for the application of special stains in the laboratory, a range of skills for the preparation of tissue for microscopy including tissue dissection methods, tissue processing, advanced cryomicrotomy, special staining techniques. The laboratory exercises will develop interpretation and writing skills to describe the microscopic appearances in tissues studied and an appreciation of the standards required for the preparation of tissue sections for diagnosis.

**Mechanisms of establishing learning outcomes**

Demonstrated competencies to be achieved by students of this unit will be knowledge of

- theory and practice of processing human tissue for microscopic assessment
- ethical guidelines, quality measures and laboratory controls for surgical specimens,
- tissue dissection methods and authority within the current guidelines for medical scientists,
- tissue processing and microtomy techniques,
- frozen section technique,
- demonstration of the biological features of normal and pathological specimens using special staining, immunohistochemistry and ultrastructural methods
- interpretation of normal histological features of human tissue and an understanding of the interpretation of the outcome for the range of adjunct tests studied

**Requirements to complete the unit**

1. Completed Histopathology 233/234
2. A keen interest in microscopic investigation.
3. Attention to detail
4. Exercise good written and verbal communication skills
5. Effectively source, access and use library catalogue and i-catalogue resources

**Safety requirements**

1. Laboratory coat to be worn at all times in the laboratory precincts.
2. Closed toe shoes to be worn in the laboratory precincts at all times.
3. Read and understand the safety manual for the laboratory.
4. Understand the biological hazards that will be encountered and personal protection that must be practiced.
5. Know emergency procedures for minor and major laboratory accidents.
6. Always inform the supervising staff if you wish to leave the laboratory during formal practical times.
7. If you wish to access the laboratory outside of designated practical times permission must be sought from the senior technical officer Mr C Cheung.

**Curtin University Mobile Phone Policy**

Mobile telephones are to be turned off during lectures and practical laboratory sessions.

**Practical Manual**

The laboratory practical manual will provide instructions for the activities to be completed during the semester. It is essential that prelab reading is completed in order to make optimum use of available time and to reduce out of hours write up time. The completed laboratory manual exercises are to be handed in before the commencement of the next weeks practical. Practical write-ups are to be submitted to the letter box of A/Prof V Williams. Late receipts will incur a penalty of 10% per day.

**Textbooks**

The following textbooks, all very useful, have been regularly available from the bookshop.

These texts are essential for the program and can be purchased from the Curtin Bookshop.

Reference Texts


A SELECTION OF TEXTS AND SOME REFERENCES HAVE BEEN PLACED IN THE CLOSED RESERVE SECTION OF THE CURTIN LIBRARY.

Online Resources

1. FLECS-Blackboard – This will provide you with Module guidelines for all practical questions and other helpful resources for the unit, including announcements regarding
the unit, HP331 and links to Aperio where many of the histopathology images associated
with lectures and practicals will be available.

2. **To access the online digital images you will need to click on the Aperio link on
Blackboard.** This will open the spectrum home page. You will logon with your student
number and the password is “student”. You will be prompted to change the password to
your personal choice. You will be able to visit the practical material in Unit Information link
on Black Board to assist you in the start up and navigation to the stored images.

(http://lms.curtin.edu.au)

Full text versions of many journals can be accessed via Curtin’s home page e library resource
Useful journals are Human Pathology, Cancer, Histochemistry, Pathology, Histopathology

**TISSUE PROCESSING AND FROZEN SECTION PREPARATION:**

Two important tutorials must be completed that are aimed to prepare students to use the
automatic tissue processing machines and the cryostat. Small groups of not more than four
students at a time will be tutored through the operation of the apparatus and supervised by
senior technical officer Mr Columbur Cheung (9266-7464). Check the HISTOPATHOLOGY
NOTICE BOARD for your allocation.

During semester you will be required to process tissue in preparation for subsequent
practicals. You will be placed in a processing group and your processing roster will be
posted on the notice board in the corridor outside the Histopathology laboratory

**Tuition Pattern**

- Lecture 12 x 2 hour/semester
- Practical 10 x 3 hours/semester

**Attendance at lectures.**

Attendance at all lectures is very strongly recommended. Not all the material is
covered by the on line material in BlackBoard
**LECTURE/TUTORIAL/ PRACTICAL PROGRAMME**

**LECTURE:**  Thursday 0800-1000 hrs  (404.204)

**PRACTICAL**  Thursday 1500-1800 hrs  (308.126)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecturer</th>
<th>Lecture</th>
<th>Practical Summary</th>
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<tbody>
<tr>
<td>1</td>
<td>1/3</td>
<td>A/Prof V Williams</td>
<td>Histopathology: Overview of course.</td>
<td>Cutting, staining and microscopic identification of tissues Decalcification of bone specimen On line normal histology</td>
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<td></td>
<td></td>
<td>A/Prof V Williams</td>
<td>From surgical excision to the microscope. Fixation, Tissue processing, Decalcification, Embedding, Cutting Artefacts identification and trouble shooting</td>
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<tr>
<td>2</td>
<td>08/3</td>
<td>Mr P Maslen</td>
<td>The surgical specimen: Laboratory handling procedures. Specimen reception, cut up authority, Selection of tissue for processing; small, medium and large specimen procedures for block selection. Orientation techniques block tracking methods. Troubleshooting and pitfalls</td>
<td>Tissue selection, description, processing. Tissue, processing and embedding demonstration. Cutting and staining of blocks a-j H&amp;E, Microscopic assessment and description. Processing blocks for practical 4</td>
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<tr>
<td>3</td>
<td>15/3</td>
<td>A/Prof V. Williams</td>
<td>Aetiology pathogenesis and detection of inflammatory and infectious diseases.</td>
<td>Microtomy exercise and Staining methods for Fungi, Virus, Parasites. Embedding tissues for Practical 4</td>
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<tr>
<td>4</td>
<td>22/3</td>
<td>A/Prof V. Williams</td>
<td>Neoplasia. Biology, epidemiology, pathological features.</td>
<td>Benign and malignant tissue Cutting and Staining. H&amp;E PAS+- Diastase, Alcian Blue pH 2.5</td>
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<tr>
<td>5</td>
<td>29/3</td>
<td>A/Prof V. Williams</td>
<td>Liver pathology: Surgical specimens, diagnostic applications and standard AP protocols</td>
<td>Liver biopsy and Decalcified tissues. Cutting and Staining Frozen section 1</td>
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<td>6</td>
<td>5/4</td>
<td>Dr T Robertson</td>
<td>Theory Application of Electron Microscopy in AP</td>
<td>Practical exam Practical exam</td>
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<td>7</td>
<td>12/4</td>
<td>Week Free</td>
<td>Week Free</td>
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<tr>
<td>8</td>
<td>19/4</td>
<td>A/Prof V. Williams</td>
<td>Renal pathology: Surgical specimens, diagnostic applications, standard AP protocols</td>
<td>Renal biopsy preparation cutting and staining. Frozen section 2</td>
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<td>9</td>
<td>26/4</td>
<td>Mr R Johnsen</td>
<td>Application of Enzyme histochemistry in AP</td>
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<td>Frozen section. Muscle enzyme demonstration</td>
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<td>9</td>
<td>2/5</td>
<td>Mr R Johnsen</td>
<td>Immunohistochemistry (IHC). Theoretical and practical applications</td>
<td>IHC 1. The effect of fixation on antigenicity</td>
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<td>10</td>
<td>9/5</td>
<td>A/Prof V. Williams</td>
<td>Application of IHC to diagnosis in AP</td>
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<td>IHC 2. PAP. Diagnostic IHC</td>
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<tr>
<td>11</td>
<td>16/5</td>
<td>Mr R Johnsen</td>
<td>Neuropathology. Overview of the role of AP in neuropathology,</td>
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<td>specimens and application of special methods</td>
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<td>Neurohistological methods. GFAP, MGE, Online revision of CNS</td>
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<td>12</td>
<td>23/5</td>
<td>A/Prof V. Williams</td>
<td>Quality assurance and risk management in AP</td>
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<td>Revision and review Image test</td>
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<td>Practical Exam Microtomy, identification of unknown tissues</td>
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<td>with the aid of stains</td>
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<tr>
<td>13</td>
<td>30/5</td>
<td>Study week</td>
<td>Study week</td>
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<tr>
<td>14</td>
<td>6/6</td>
<td>Examination week</td>
<td>Study week</td>
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<tr>
<td>15</td>
<td>13/6</td>
<td>Examination week</td>
<td>Study week</td>
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**Assessment Details**

NOTE AND MARK THE DATES OF THE FOLLOWING ASSESSMENTS IN YOUR UNIT OUTLINE

**Method of Assessment**

<table>
<thead>
<tr>
<th>Method of Assessment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Assignment</td>
<td>10%</td>
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<tr>
<td>Mid Semester Practical</td>
<td>10%</td>
</tr>
<tr>
<td>Completed Laboratory Exercises</td>
<td>15%</td>
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<tr>
<td>End of semester practical examinations (image and prac)</td>
<td>25%</td>
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<tr>
<td>End of semester theory examination</td>
<td>40%</td>
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<tr>
<td>TOTAL</td>
<td>100%</td>
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Detailed information on assessment in this unit can be found under “Assessment Details” at the end of this document.
Practical Examination (35%) - Wk 6 (10%)

The practical assessments will test competency in sectioning, staining and identification of an unknown tissue and completing an image test. Students must achieve a minimum 50% in end of semester practical examinations to pass the unit.

Completed Laboratory Manual (15%)

Students are expected to finish their lab work weekly and submit the completed exercises for assessment by the end of business on the eve of the next practical. There is a 10% per day penalty for late delivery.

Guidelines for Written submissions:
All work for this unit must be grammatically correct, legible, and meet the expected academic/professional standards.

Final Examinations (40%)

The final theory examination is a 2 hour essay-answer exam on all lecture/practical material. A sample of the final exam questions (and answers) will be given in the WEB at a later date. Previous exam papers are also available in the University Library.

NOTE: STUDENTS MUST ACHIEVE AT LEAST 50% FOR THIS END OF SEMESTER EXAMINATION TO SUCCESSFULLY COMPLETE THIS UNIT.

Supplementary Examinations

Supplementary examinations are awarded only at the discretion of the Board of Examiners. The aim of a supplementary examination is to allow the student to correct minor problems/deficiencies in the initial assessment and not to gain extra study time or correct major problems.

Supplementary Examinations continued

Supplementary examinations are not automatically awarded. The Board of Examiners will carefully review individual cases. No written application for supplementary examination will be considered. Curtin University policy allows one only supplementary exam offer per student per semester.
School of Biomedical Sciences Plagiarism Policy

It is not acceptable to copy the words of other students or authors when completing the weekly exercises and assignments in this unit. This action constitutes plagiarism and is regarded as academic malpractice. The penalties for plagiarism can be severe and may include termination from your course of study. All direct quotes must be correctly attributed to the author and should be kept to a minimum. You should include a list of references to acknowledge the source(s) of information used to produce any written work.

Useful examples and explanations of plagiarism may be seen at the following web site – These will help you in understanding the nature of this form of academic malpractice.

http://www.indiana.edu/~wts/wts/plagiarism.html

As a guide only, typical penalties which may be imposed by the School of Biomedical Sciences for some of the more common types of plagiarism (including collusion) are shown in the Table below. Please note that each case of academic malpractice is assessed individually, and that penalties actually imposed by the Head of School (or delgatee) may vary from the examples shown in the Table.

<table>
<thead>
<tr>
<th>Example</th>
<th>Degree of seriousness</th>
<th>Typical Penalty</th>
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</thead>
<tbody>
<tr>
<td>Students submitting very similar work (even as a result of legitimate co-operation)</td>
<td>Collusion Minor to Severe depending on context</td>
<td>Loss of marks for that question or assignment etc by both students</td>
</tr>
<tr>
<td>Not referencing input (factual statements, definitions etc) where students’ words are used</td>
<td>Minor to Intermediate</td>
<td>Loss of 5% of assessment entity for each instance</td>
</tr>
<tr>
<td>Not referencing input where plagiarised words are used</td>
<td>Depends on context, but may be serious</td>
<td>Loss of 50 – 100% of marks for that question or assignment as appropriate</td>
</tr>
<tr>
<td>Not acknowledging ideas or concepts of others (ie. stealing intellectual property)</td>
<td>Serious misconduct</td>
<td>Loss of marks plus an additional penalty which could entail failure of unit and/or possible termination from course depending on the circumstances</td>
</tr>
</tbody>
</table>

Feedback

The School welcomes your feedback as one way to keep improving this unit. Later this semester, you will be encouraged to give unit feedback through eVALUate, Curtin’s online student feedback system (see http://evaluate.curtin.edu.au ).