UNSW AUSTRALIA | Medical Sciences Medicine

PATH3206
Cancer Pathology

2016

Course convenor: Dr Christine van Vliet

SEMESTER I

CRICOS Provider Code 00098G

PATH3206 Cancer Pathology

2016

Convenor: Dr Christine van Vliet
Co-convenor: Dr Darren Saunders

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

- Advice for Students
- Learning Resources

(or see "STUDENTS" tab at medicalsciences.med.unsw.edu.au)

PATH3206 Cancer Pathology Integrated Timetable 2016

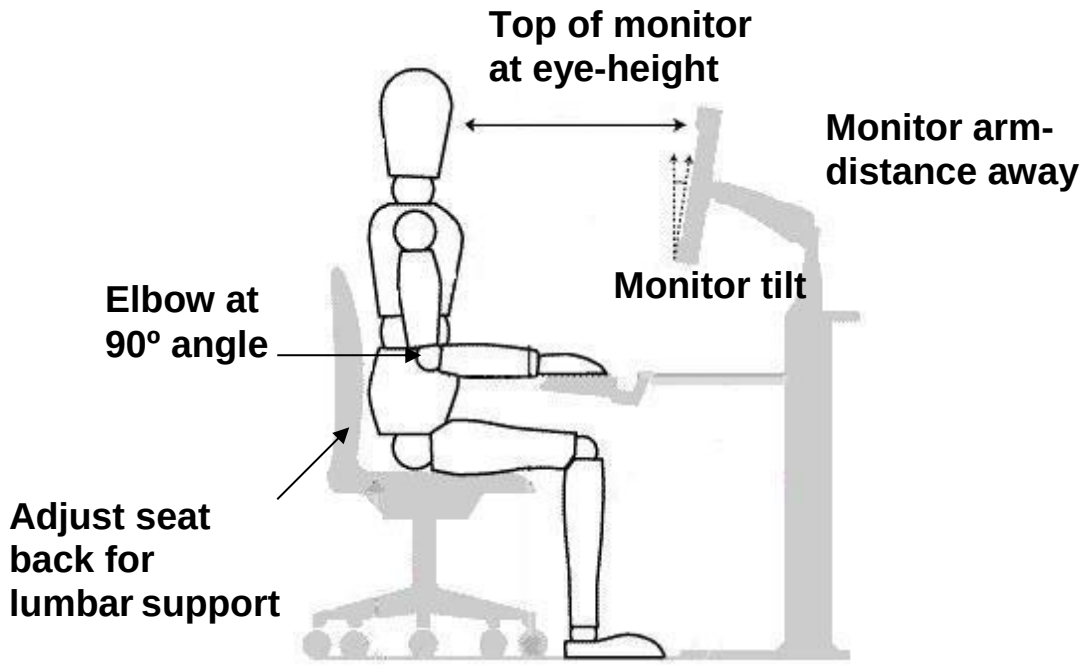
Week	Date	Time	Location	Lecturer	Title
1	1/03/2016	9-11	WWG06/G07	van Vliet	**Practical** – Introduction
	1/03/2016	11-12	LG03	van Vliet	**Lecture** – Neoplasia I
	2/03/2016	10-11	LG03	van Vliet	**Lecture** – Neoplasia II
	3/03/2016	1-2	LG03	van Vliet	**Tutorial -** Neoplasia
2	8/03/2016	9-11	WWG06/G07	van Vliet	**Practical** - Neoplasia
	8/03/2016	11-12	LG03	van Vliet	**Lecture** – Regulation of cell cycle I
	9/03/2016	10-11	LG03	van Vliet	**Lecture** – Regulation of cell cycle II
	10/03/2016	1-2	LG03	Saunders	**Tutorial –** Cancer Research I
3	15/03/2016	9-11	WWG06/G07	van Vliet	**Practical** - Regulation of cell cycle
	15/03/2016	11-12	LG03	van Vliet	**Lecture** – Cancer pathology I
	16/03/2016	10-11	LG03	van Vliet	**Lecture** – Cervical carcinogenesis
	17/03/2016	1-2	LG03	van Vliet	**Tutorial -** Regulation of cell cycle (TIQ)
4	22/03/2016	9-11	WWG06/G07	van Vliet	**Practical** – Cervical carcinogenesis
	22/03/2016	11-12	LG03	van Vliet	**Lecture** – Cancer Pathology II
	23/03/2016	10-11	LG03	Stewart	**Lecture** – Carcinogenesis I
	24/03/2016	1-2	LG03	van Vliet	**Tutorial –** Cervical carcinogenesis (TIQ)
				MID SESSION	**BREAK**
6	12/04/2016	9-11	WWG06/G07	van Vliet	**Practical** – Team presentation
	12/04/2016	11-12	LG03	van Vliet	**Lecture** – Upper GI neoplasms
	13/04/2016	10-11	LG03	Stewart	**Lecture** – Carcinogenesis II
	14/04/2016	1-2	LG03	van Vliet	**Tutorial –** Cancer Pathology (TIQ)
7	19/04/2016	9-11	WWG06/G07	van Vliet	**MID SESSION EXAM**
	19/04/2016	11-12	LG03	van Vliet	**Lecture** – Viral carcinogenesis
	20/04/2016	10-11	LG03	Kumar	**Lecture** – Pulmonary neoplasms
	21/04/2016	1-2	LG03	van Vliet	**Tutorial –** Upper GI neoplasms (TIQ)
8	26/04/2016	9-11	WWG06/G07	Tedla	**Practical** – Pulmonary neoplasms
	26/04/2016	11-12	LG03	van Vliet	**Lecture** – Cancer pathology III
	27/04/2016	10-11	LG03	Velan	**Lecture** – Skin neoplasms
	28/04/2016	1-2	LG03	van Vliet	**Tutorial -** Pulmonary neoplasms (TIQ)
9	3/05/2016	9-11	WWG06/G07	Tedla	**Practical** – Skin neoplasms
	3/05/2016	11-12	LG03	van Vliet	**Lecture** – Colorectal carcinogenesis I
	4/05/2016	10-11	LG03	van Vliet	**Lecture** – Colorectal carcinogenesis II
	5/05/2016	1-2	See allocated		**Tutorial –** Skin neoplasms (TIQ)
10	10/05/2016	9-11	WWG06/G07	van Vliet	**Practical** – Colorectal carcinogenesis
	10/05/2016	11-12	LG03	van Vliet	**Lecture** – Breast carcinogenesis
	11/05/2016	10-11	LG03	Saunders	**Lecture** – Cancer research II
	12/5/2016	1-2	See allocated		**Tutorial** – Colorectal carcinogenesis (TIQ)

11	17/05/2016	9-11	WWG06/G07	van Vliet	**Practical** – Breast carcinogenesis
	17/05/2016	11-12	LG03	Dziegielewski	**Lecture** – Prostate carcinoma
	18/05/2016	10-11	LG03	Velan	**Lecture** – Intracranial neoplasms
	19/05/2016	1-2	See allocated		**Tutorial –** Breast carcinogenesis (TIQ)
12	24/05/2016	9-11	WWG06/G07	van Vliet	**Practical** - Prostate carcinoma
	24/05/2016	11-12	LG03	van Vliet	**Lecture** – Thyroid and pancreas
	25/05/2016	10-11	LG03	Saunders	**Lecture** – Cancer Research III
	26/05/2016	1-2	See allocated		**Tutorial -** Prostate carcinoma (TIQ)
13	31/05/2016	9-11	WWG06/G07	van Vliet	**Practical** – **FEEDBACK SESSION**
	31/05/2016	11-12	LG03	van Vliet	**Lecture** – Reproductive neoplasms
	1/06/2016	10-11	LG03	van Vliet	**Lecture** – Lymphoma & leukaemia
	2/06/2016	1-2	See allocated		**Tutorial –** Thyroid and pancreas (TIQ)

Pathology Teaching Laboratory Student Risk Assessment	UNSW THE UNIVERSITY OF NEW SOUTH WALES	Pathology practicals in Wallace Wurth

Hazards	Risks	Controls
Ergonomics	Musculoskeletal pain.	Correct workstation set-up.
Electrical	Electrical shock/fire	Check electrical equipment in good condition before use. All portable electrical equipment tested and tagged.
Handling pots	Chemical spillage	Instructions on correct manual handling of pots

Workstation set-up



Manual handling of pots

- All pots contain real human tissue that has been generously donated to medical science and **must be treated with appropriate respect and dignity.**
- Specimens are preserved in Perspex and contain a range of preserving chemicals that may be harmful. Chemicals used include **formalin, pyridine, sodium dithionate**. A full list of chemicals and associated MSDS information is available in the H&S Station and on the SoMS website.

MANUAL HANDLING OF POTS

1. It is recommended that all students wash their hands thoroughly as they leave practical class Chemical residues may be present on pots.
2. **Carry one pot at a time**. Use two hands at ALL TIMES and support the base of pot.
3. **Avoid rough handling and/or tilting of pots**. This can cause leaking joints or tear tissue in specimen.
4. Limit the number of pots on a table at any one time.

SPILLS AND LEAKAGES

If a specimen is leaking or broken, do not attempt to wipe up the spillage. Clear the area and immediately inform a member of academic staff or the Museum Manager. A spill kit will then be used to absorb the fumes**.**

Personal Protective Equipment

Not necessary in these practicals.
Enclosed shoes must be worn to all Practicals.

Emergency Procedures

In the event of an alarm, follow the instructions of the demonstrator. The initial sound is advising you to prepare for evacuation and during this time start packing up your things. The second sound gives instruction to leave. The Wallace Wurth assembly point is in the lawn in front of the Chancellery. In the event of an injury inform the demonstrator. First aiders and contact details are on display by the lifts. There is a first aid kit in the laboratory and the Wallace Wurth security office.

Clean up and waste disposal

Spill kit

Declaration

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

Signature:……Date:……
Student Number:……..

Staff contacts in the Department of Pathology

Name	Title	E-mail
Dr Christine van Vliet	PATH3206 Convenor, Lecturer, Department of Pathology	path3206@unsw.edu.au Level 2 Wallace Wurth bldg Work days: Tuesday, Thursday
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PATH3206 Cancer Pathology

Introduction

Welcome to PATH3206 Cancer Pathology.

PATH3206 aims to promote understanding of recent advances in the pathogenetic mechanisms underlying neoplasia. There is detailed discussion of molecular carcinogenesis, the metastatic process and techniques for diagnosis. Topics covered include neoplasia of the colon, breast, prostate, oesophagus, stomach, skin, lung cervix and reproductive neoplasms.

To understand these processes, you will draw on your knowledge of normal anatomy, histology, biochemistry and physiology.

This course is offered during semester 1 and counts for six units of credit. PATH2201/2 (Processes in Disease) is a prerequisite for the course.

The UNSW Handbook contains information for students wishing to undertake a major in Pathology.

For those wishing to pursue a career in research or hospital based laboratory work, the course will not only develop their basic knowledge of molecular processes, but also provide a framework for understanding how these processes link to the modern practice of medicine. Similarly, for those who may wish to pursue a career in the health sciences, the course will provide an understanding of the cellular and molecular processes underlying the clinical manifestations of neoplasia.

The staff of the Department of Pathology join us in wishing you an interesting and enjoyable semester 1.

Dr Christine van Vliet (PATH3206 Convenor)
Dr Darren Saunders (PATH3206, Co-convenor)

Course administration

Administrative and general problems related to your attendance, or the content and conduct of the course, can in the first instance be addressed by consulting Dr Christine van Vliet (path3206@unsw.edu.au) by e-mail. Students wishing to see other members of staff should email and **make an appointment**. If students have difficulties of a personal nature, they should contact the School's Grievance Officer, A/Prof Nick Di Girolamo.

Should you feel that there are particular circumstances that have affected your performance in the course; you should lodge an application for special consideration via: student.unsw.edu.au/special-consideration.

It is intended that supplementary exams for the School of Medical Sciences in Semester 1, 2016 will be held on the 12th, 13th and 14th July 2016. Special considerations sought outside the 3 day time period WILL NOT be accepted except in TRULY exceptional circumstances.

Information on the different research units in the Department of Pathology and the research interests of each staff member is available at Department of Pathology's home page at http://medicalsciences.med.unsw.edu.au/

Resources for students

Recommended text

You are expected to use the following text available online via a link in PATH3206 Moodle or the UNSW library SearchFirst website - http://library.unsw.edu.au/HowDoI/databases.html (zID and zPass required). Search for the database MD Consult, then search for Robbins Basic Pathology.

Robbins Basic Pathology. 9th edition. V. Kumar, A.K. Abbas, & J.C. Aster (2012). Saunders & Co. Philadelphia PA; Elsevier Saunders.

Highly recommended for students wishing to study the molecular biology or clinical features of diseases in greater depth:

Robbins and Cotran Pathologic Basis of Disease 9th edition. V. Kumar, A.K. Abbas & J.C. Aster (2015) Elsevier Saunders (also available as an eBook via the UNSW Library website).

Images of disease (IOD) database

Images of Disease (IOD) is a database of images used for teaching within the Department. The latest version of Images of Disease is now available online, optimised for smart phones and tablet computers, as well as Firefox 4+, Chrome 13+ and Safari browsers on laptop or desktop computers – http://iod.med.unsw.edu.au (zID and zPas required). An interactive Images of Disease app for iPhone and iPad is available to download from that website. Android and Windows phone versions of the IOD app are also available.

The following information might help you understand more about IOD.

What you get

- Over 3000 images relevant to your study as an undergraduate. Many of these images represent specimens from the Museum of Human Disease, or histopathological images from the student histopathology slide sets. Accompanying x-rays and images of surgical and autopsy specimens are also available.
- A database that links them all together
- A user interface that lets you access the images in a variety of ways
- Interactive "hotspotted" images to assist your understanding of macroscopic Pathology.

What you do not get

- A collection of images that you can send to your friends, put in your magazines, put on the Internet or whatever other scheme seems clever at the time.

  Many of the images used in this program are of a sensitive nature, and are intended for the purpose of private study by pathology students and graduates. You should exercise appropriate standards of professional ethics when using them.
- A high level of technical support

  Unfortunately, it will be impossible for us to answer all your problems immediately, as we have very limited resources. We will of course make every effort to help, and will provide you with a listing of known problems and difficulties on request.

The Museum of Human Disease page contains links to some excellent undergraduate and postgraduate educational resources, of which we would encourage you to make full use.

The address is: **"http://web.med.unsw.edu.au/pathology/pathmus/"**.

Additional learning resources

In addition, there are many resources available on the web, which vary from simple patient information brochures to on-line pathology courses, to information on the latest research. Some general sites you may find useful are:

Medline Plus ('health topics' index of disease with information)
http://www.nlm.nih.gov/medlineplus/healthtopics.html
The BEST Network Slice image database - http://www.best.edu.au/Slice
The Cancer Council New South Wales
http://www.nswcc.org.au/
The NSW Cancer Institute
http://www.cancerinstitute.org.au/
National Cancer Institute
http://www.cancer.gov/

Research opportunities

Opportunities exist for all students wishing to undertake undergraduate and postgraduate research programs within the School of Medical Sciences. Information can be accessed via the Faculty of Medicine directory for the School of Medical Sciences at:

http://medicalsciences.med.unsw.edu.au/somsweb.nsf/page/Research

Student learning outcomes and graduate attributes

For the cancer topics covered:

At the completion of this course you should be able to:

1. Describe and explain the molecular and cellular pathogenetic mechanisms of carcinogenesis;
2. Describe the macroscopic and microscopic appearances;
3. Correlate the clinical features with the underlying pathogenetic mechanisms;
4. Describe the epidemiology, aetiology, diagnosis, staging, treatment and prognosis of cancers;
5. Discuss recent advances in knowledge pertaining to the molecular pathogenesis;
6. Develop written and oral skills in scientific communication.
7. Develop skills in collaborative teamwork

You are encouraged to develop the following Graduate Attributes by undertaking the learning activities in this course. These attributes will be assessed within the prescribed assessment tasks (see Assessment):

1. An in-depth engagement with the relevant disciplinary knowledge in its interdisciplinary context.
2. The capacity for analytical and critical thinking and for creative problem-solving.
3. The ability to engage in independent and reflective learning.
4. The skills required for collaborative and multidisciplinary work

Learning and Teaching approach

The course employs a variety of teaching modes in order to facilitate your learning:

1. A **collaborative, team-based approach** to learning. It is anticipated that students will have an enhanced learning experience through the use of team quizzes and peer teaching. You are also encouraged to utilise your allocated teams as study groups.
2. A series of **lectures** introduce you to pathological processes, as well as specific examples of those processes affecting organs and tissues;
3. **Tutorials** are intended to extend and amplify your understanding of material presented in lectures in an interactive format, where you are encouraged to clarify any difficulties regarding the concepts discussed. Students will be allocated into teams and will complete individual and team quizzes. Pre-reading will be assigned for each tutorial;
4. **Practical classes** employ computer-based virtual microscopy, in order to permit correlation between disease processes, changes in cells and tissues at the microscopic and macroscopic levels and the manifestations of disease.
   Practical classes will reinforce the clinico-pathological correlations associated with each topic. They are intended to help you to acquire the ability to recognize the macroscopic and microscopic features of pathology specimens and to relate the pathology to clinical application. Macroscopic “pots” will be generally used in conjunction with projected microscopic slides, x-rays and other materials;
5. Learning is supported via **Moodle**. Announcements, timetables, lecture slides, vslides and other resources will be made available during the course. Please be advised that from now on you will no longer access the virtual slides used for this course from the old VSlides website. You will now access the slides through a self-enrolled Moodle module. New functionality will result in you being automatically logged in to the Slice image bank allowing you to use the annotation tool. Please follow the link below and enter the key to gain access:

   Moodle VSlides module: http://moodle.telt.unsw.edu.au/course/view.php?id=21070
   Student Key: VSlides

Assessment

Students will undertake multiple forms of assessment during semester:

- Team and Individual Quizzes (TIQ) 10%
- Team and Individual Project (TIP) 15%
- Mid-session exam 25%
- End of course (final) examination 50%

Team and Individual Quizzes (TIQ)

There will be quizzes held in the tutorial sessions consisting of MCQs. Some tutorial quizzes will be undertaken by the individual student and then by the team, others just individually. Pre-reading for the quizzes is specified in the tutorial outlines of the manual. Students need to provide a reason to Dr van Vliet for a missed tutorial via email (path3206@unsw.edu.au). All students who miss a tutorial for medical reasons need to attach a medical certificate to the email. Students who provide a valid reason will receive 50% of their team mark. If no reason is provided, the student will receive zero for both the individual and team quiz however the team will not penalised. Quizzes will start at five minutes past the hour. If you arrive late for a tutorial quiz, no time extension will be granted.

Team and Individual Project (TIP)

In week 3 each team will be allocated a specimen/s which illustrates pathological changes which may occur as a result of a neoplasm. The aim of the team project is to provide an in-depth understanding of the pathobiological mechanisms of the neoplasm. The students are to create a presentation for week 6. A full description of the project and assessment criteria will be given to students in week 3.

Mid-session examination

A mid-session exam will be conducted. The examination will include material covered in Weeks 1-6 of PATH3206. The skills achieved by mastering the tutorial quizzes will be assessed in this exam.

End of course (final) examination

A 2-hour end of course examination. The questions assess **all the learning outcomes**. This exam encourages an in-depth engagement with pathology within a clinical context. The questions vary in style; some questions may have two parts.

Missed mid-session or end of course exams

If in any circumstances you unavoidably miss a mid-session or end of course examination, you must inform the Registrar and also contact the relevant Course Office immediately. Normally, if you miss an exam (without medical reason) you will be given an absent fail. If you arrive late for an exam no time extension will be granted. It is your responsibility to check timetable and ensure that you arrive with sufficient time.

Supplementary examination for end of course exam

A supplementary examination may be awarded at the discretion of the Department of Pathology to students who have provided evidence for special consideration for the end of course exam according to the UNSW guidelines. The deferred exam may include a significant oral element. Students who believe that they are eligible for further assessment must contact Dr van Vliet to seek further information. It is intended that supplementary exams for the School of Medical Sciences in Semester 1, 2016 will be held on the 12th, 13th and 14th July, 2016.

Medical certificates

If you miss any examination for medical reasons you must lodge a medical certificate with New South Q within **3 DAYS** (refer to UNSW Student Gateway@ www.student.unsw.edu.au for further details). **Special considerations sought outside the 3 day time period WILL NOT be accepted except in TRULY exceptional circumstances.**

Attendance requirements

Attendance at tutorials and practical sessions is compulsory. An 80% attendance is required for you to be eligible to sit the final examination. Students need to provide a reason to Dr van Vliet for a missed tutorial or practical via email (path3206@unsw.edu.au). All students who miss a tutorial or practical for medical reasons need to attach a medical certificate to the email.

Sample examination paper

THE UNIVERSITY OF NEW SOUTH WALES
EXAMINATION

PATH 3206
CANCER PATHOLOGY

TIME ALLOWED – **2 HOURS** TOTAL NUMBER OF QUESTIONS - **4**

ANSWER ALL QUESTIONS. ALL QUESTIONS ARE OF EQUAL VALUE

THIS PAPER MAY NOT BE RETAINED BY THE CANDIDATE.

NO HANDWRITTEN OR TYPED NOTES OR TEXTS MAY BE BROUGHT INTO THE EXAMINATION ROOM.

ANSWER EACH QUESTION IN A SEPARATE BOOK. ALL ANSWERS MUST BE WRITTEN IN INK. PENCILS MAY ONLY BE USED FOR DRAWING.

Question 1

(a) Write notes on factors which can help determine the prognosis of a woman with carcinoma of the breast

(b) Compare and contrast the predisposing factors, clinical features and biological behaviours of melanoma and basal cell carcinoma of the skin

Question 2

(a) Discuss the clinical consequences of colorectal neoplasia, including the effects of benign colorectal neoplasms.

(b) Discuss genetic changes that characterise development and progression of colorectal neoplasms. Highlight the ways in which understanding of hereditary bowel cancer syndromes has helped to explain the different genetic pathways involved in sporadic colorectal cancers.

Question 3

(a) Write notes on **one** of the following:

(i) Role of oncogenes and apoptosis-related genes in the development of cancer

or

ii) Role of viruses in carcinogenesis

(b) Describe the macroscopic features that may allow differentiation between benign and malignant neoplasms.

Question 4

A 38 year old woman presented to her local doctor with a 2 month history of bleeding after intercourse. More recently she had a spontaneous bloodstained discharge. After a series of investigations the woman underwent a hysterectomy.

i) What is the likely diagnosis? How could this have been confirmed preoperatively?

ii) Discuss the pathogenesis of the disease listed in part i. How might his disease have been prevented?

iii) If this woman had not undergone treatment how might have her disease progressed?

The Museum of Human Disease

The Donald Wilhelm Museum of Human Disease is located on the ground floor of the Samuels Building (Building F25). Originally located on the 5th floor of the Wallace Wurth Building, it was established by Professor Donald Wilhelm, the Foundation Professor of Pathology at this university. Thanks to his foresight, and to the tireless efforts of Dr G. Higgins (the Museum Curator until 2004), the Museum has been meticulously maintained and updated over the years to reflect the changing patterns of disease in our society. The Museum contains over 2,700 specimens (or "pots"), which display diseased human tissue at the macroscopic level, usually preserved in formalin. Specimens are obtained both from organs removed surgically and from tissue obtained at autopsy, where the natural history of disease is in full view. **Please take note that some specimens of diseases which have become rare, e.g. diphtheria, are over 60 years old, and are irreplaceable.** Each specimen is numbered and is accompanied by a clinical history (when known), a macroscopic description of the abnormalities displayed, and a histopathological description of changes at the microscopic level (where relevant). That information, specific to each of thirty areas (or "bays"), can be found in the Museum catalogues located in a bracket within each bay.

All the specimens in the museum are arranged in one or other of two major groups. One group comprises collections of specimens according to pathological processes such as congenital, inflammation and healing, vascular, neoplasia etc. The second group comprises collections of specimens under organ systems, such as cardiovascular, central nervous, renal etc.

As responsible adults, we expect you to maintain decorum in the Museum, behave with care and respect for the integrity of the specimens, and help to keep the Museum tidy at all times. This means no eating or drinking in the Museum, and always returning specimens and catalogues to their allocated places. **Do not shake the pots!** This activity conveys no useful information, but often damages the specimens. If you discover that a specimen is leaking or broken, follow the instructions listed in the safety notice below. **Remember that the Museum is a precious learning resource, of which you are encouraged to make full use**.

Security in the museum

It is a crime under the Human Tissue Act to steal or mistreat material preserved in the Museum or practical class laboratories. Anyone who contravenes the Act will be prosecuted.

In order to protect the collection of specimens, access to the Museum is restricted for students during weekdays from 8 a.m. to approximately 8 p.m. The Museum is security locked, and can only be entered by using your student card to enable the doors to be opened.

The Museum and practical class laboratories are under constant electronic surveillance.

Safety in the museum

- Always handle museum specimens with care and respect. All specimens consist of generously donated human tissue.
- The specimens are preserved in Perspex and contain a range of preserving chemicals that may be harmful. Chemicals used may include formalin, pyridine and sodium dithionate. A full list of chemicals and associated information is available at the Health and Safety (H&S) station in the Museum and on the SoMS website.

Chemical	Max. Percentage Composition
Glycerol	17 (v/v)
Pyridine	0.8 (v/v)
Sodium Acetate	7 (w/v)
Formalin	<2 (v/v)
Sodium Dithionate	0.4 (w/v)

- For reasons of hygiene, never take food or drink into the museum.
- Never leave a museum specimen on the floor, or in any precarious position.
- If a specimen is leaking or broken, do not attempt to wipe up the spillage. Clear the area and immediately inform the Museum Manager or a member of academic staff. A spill kit will then be used to absorb the fumes.
- Remember that the museum is here for your benefit - your cooperation in maintaining neatness and safety at all times is appreciated.

- For more information on matters related to health and safety policies of UNSW visit this web site. http://www.safety.unsw.edu.au/