UNSW Course Outline

PATH3210 Visualising Disease - 2024

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General Course Information

Course Code : PATH3210
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : Faculty of Medicine and Health
Academic Unit : School of Biomedical Sciences
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

PATH3210 will provide you with an overview of how different imaging techniques work and how to apply them to obtain multidimensional data about disease processes. You will gain insight into how images are formed and processed for analysis, and in turn how to critically evaluate the

quality of an imaging experiment. Key topics that will be covered include sample preparation, effective use of imaging instruments, the use of artificial intelligence for segmentation and how to obtain quantitative data from imaging experiments.

Building on this knowledge we explore how to apply imaging technologies for fundamental biomedical research and within the clinical environment. Collectively this provides a solid basis for future careers in biomedical imaging in research, the clinic or in industry.

Course Aims

There are four key aims of the course.

1. Be able to identify the strengths and limitations of key imaging techniques that can be employed to study, diagnose and treat diseases.
2. Be able to design an imaging experiment to evaluate a hypothesis.
3. Develop skills to critically analyse and quantify disease processes from images generated by different imaging modalities.
4. Develop oral and written communications skills that underpin the dissemination of research using imaging.

Relationship to Other Courses

Assistance with progression checking:

If you are unsure how this course fits within your program, you can seek guidance on optimising your program structure from staff at the Nucleus Student Hub.

- Progression plans for UNSW Medicine and Health programs can be found on the UNSW Medicine & Health website.
- Progression plans for UNSW Science programs can be found on the UNSW Science website.

This course is prescribed elective in a Pathology Major.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Critically evaluate the use of an imaging technique to obtain data on a disease-associated process.
CLO2 : Process images to obtain quantitative data about an object of interest.
CLO3 : Interpret images and assess the quality of imaging data.
CLO4 : Communicate concepts of microscopy and biomedical imaging used by researchers and clinicians.

Course Learning Outcomes	Assessment Item
CLO1 : Critically evaluate the use of an imaging technique to obtain data on a disease-associated process.	• Quizzes • Literature research (Group oral presentation) • Literature Report (Individual - Written report) • Exam
CLO2 : Process images to obtain quantitative data about an object of interest.	• Quizzes • Literature research (Group oral presentation) • Literature Report (Individual - Written report) • Exam
CLO3 : Interpret images and assess the quality of imaging data.	• Quizzes • Literature research (Group oral presentation) • Literature Report (Individual - Written report) • Exam
CLO4 : Communicate concepts of microscopy and biomedical imaging used by researchers and clinicians.	• Literature research (Group oral presentation) • Literature Report (Individual - Written report)

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

All course materials and course announcements are provided on the course learning management system, Moodle (or Open Access).

By accessing and using the ICT resources provided by UNSW, you are agreeing to abide by the 'Acceptable Use of UNSW ICT Resources' policy particularly on respect for intellectual property and copyright, legal and ethical use of ICT resources and security and privacy.

Additional Course Information

The Department of Pathology is part of the School of Biomedical Science, UNSW Medicine and Health, and is located in the Wallace Wurth Building. Associate Professor Cristan Herbert is the Head of Teaching in the department and appointments to see him may be made via emailing C.Herbert@unsw.edu.au

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quizzes Assessment Format: Individual	10%	Start Date: Will occur in weeks 2,3,5,7 and 8 Due Date: available online for 24 hrs
Literature research (Group oral presentation) Assessment Format: Group	20%	Start Date: select publications in Week 2 Due Date: Week 7: 25 March - 31 March
Literature Report (Individual - Written report) Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Week 9: 08 April - 14 April
Exam Assessment Format: Individual	40%	Start Date: During Exam period Due Date: During Exam period

Assessment Details

Quizzes

Assessment Overview

The purpose of this assessment is to evaluate your level of comprehension of lecture and practical content throughout the term. This will be done via online multiple choice quizzes which will occur both early and mid term. You will have only one attempt on each quiz, and the maximum weighting across all quizzes is 10% of your total mark.

Feedback process: Feedback will be provided by two mechanisms, (i) automatic feedback of the correct answer via online quizzes and (ii) discussion of correct and incorrect answers in tutorials.

Course Learning Outcomes

- CLO1 : Critically evaluate the use of an imaging technique to obtain data on a disease-associated process.
- CLO2 : Process images to obtain quantitative data about an object of interest.
- CLO3 : Interpret images and assess the quality of imaging data.

Detailed Assessment Description

Detailed information about this assessment will be provided on the course Moodle page.

Assessment Length

5 x 10 minutes

Submission notes

Quizzes held course Moodle site, and automatically graded. No short extension is available for this assessment task.

Assessment information

Use of Generative Artificial Intelligence (AI) in the assessment

UNSW Pro-Vice Chancellor Education and Student Experience (PVCESE) provides guidance on the use of generative Artificial Intelligence in assessments.

No Assistance is permitted for this task.

Assignment submission Turnitin type

This is not a Turnitin assignment

Literature research (Group oral presentation)

Assessment Overview

The purpose of this assessment is to evaluate your critical thinking skills, capacity for teamwork, communication skills and comprehension of course material. You will examine a recent biomedical imaging article and design alternative imaging methodologies to address the aims of the publication. The format will be in a short presentation to the class and a panel of examiners (20%). The presentations will be held in class mid- term.

Criteria for assessment will be: 1. Structure, 2. Timing, 3. Understanding and 4. Communication

Feedback process: Using a marking rubric, two academics, your fellow group members and randomly selected peers will conduct the assessment and then provide feedback for each group at the end of each presentation. The marks and feedback will be provided via the learning management system.

Course Learning Outcomes

- CLO1 : Critically evaluate the use of an imaging technique to obtain data on a disease-associated process.

- CLO2 : Process images to obtain quantitative data about an object of interest.
- CLO3 : Interpret images and assess the quality of imaging data.
- CLO4 : Communicate concepts of microscopy and biomedical imaging used by researchers and clinicians.

Detailed Assessment Description

Detailed information about this assessment will be provided on the course Moodle page.

Assessment Length

8 minutes

Submission notes

No short extension is available for this assessment task.

Assessment information

Use of Generative Artificial Intelligence (AI) in the assessment

UNSW Pro-Vice Chancellor Education and Student Experience (PVCESE) provides guidance on the use of generative Artificial Intelligence in assessments.

No Assistance is permitted for this assessment.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Literature Report (Individual - Written report)

Assessment Overview

The purpose of this assessment is to evaluate your critical thinking skills, and comprehension of course material. You will examine a recent biomedical imaging article and design alternative imaging methodologies to address the aims of the publication. The format for this assessment is a written report of 1500 words maximum excluding references (30%). The report is due toward the end of term.

Feedback process: Using a marking rubric, individual feedback will be provided.

Course Learning Outcomes

- CLO1 : Critically evaluate the use of an imaging technique to obtain data on a disease-associated process.
- CLO2 : Process images to obtain quantitative data about an object of interest.
- CLO3 : Interpret images and assess the quality of imaging data.

- CLO4 : Communicate concepts of microscopy and biomedical imaging used by researchers and clinicians.

Detailed Assessment Description

Detailed information about this assessment will be provided on the course Moodle page.

Assessment Length

1500 words

Submission notes

A short extension of two days is available for this assessment task.

Assessment information

Use of Generative Artificial Intelligence (AI) in the assessment

UNSW Pro-Vice Chancellor Education and Student Experience (PVCESE) provides guidance on the use of generative Artificial Intelligence in assessments.

No Assistance should be used in this assessment.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Exam

Assessment Overview

The purpose of this assessment is to assess your understanding of the course material, as well as, demonstrate your capacity to apply this knowledge and design imaging experiments. The exam which makes up 40% of your mark will be held in the form of multiple choice and short answer questions. It will cover material presented in lectures, workshops / seminars and practical classes. The exam will be held during the official exam period.

Feedback process: Individual feedback is via assessment performance.

Course Learning Outcomes

- CLO1 : Critically evaluate the use of an imaging technique to obtain data on a disease-associated process.
- CLO2 : Process images to obtain quantitative data about an object of interest.
- CLO3 : Interpret images and assess the quality of imaging data.

Detailed Assessment Description

Detailed information about this assessment will be provided one the course Moodle Page.

Assessment Length

2 hours

Submission notes

No short extension is available for this assessment task.

Assessment information

Use of Generative Artificial Intelligence (AI) in the assessment

UNSW Pro-Vice Chancellor Education and Student Experience (PVCESE) provides guidance on the use of generative Artificial Intelligence in assessments.

No Assistance shoudlbe used with this assessment.

Assignment submission Turnitin type

Not Applicable

General Assessment Information

Detailed instructions regarding assessments for this course are provided on the course Moodle page (or Open Learning).

For student information on results, grades, and guides to assessment see: https://student.unsw.edu.au/assessment

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

- Achieve a composite grade of at least 50 out of 100
- Meet any additional requirements specified in the assessment details section and on Moodle.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Module	Course introduction, Light microscopy and Fluorescence
Week 2 : 19 February - 25 February	Module	Specimen prepartion and electron microscopy
Week 3 : 26 February - 3 March	Module	Image Processing and Analyis, Imaging in the 3rd Dimension
Week 4 : 4 March - 10 March	Module	Imaging in the Fourth Dimension
Week 5 : 11 March - 17 March	Module	Systems Approaches, AI and intravital imaging.
Week 7 : 25 March - 31 March	Module	Advanced Imaging approaches and Assesment 2.
Week 8 : 1 April - 7 April	Module	Preclincial and clinical Imaging Modalities
Week 9 : 8 April - 14 April	Module	Clinical Imaging and assessment 3 Due
Week 10 : 15 April - 21 April	Module	Personalised Medicine, Drug Development and Career development.

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

The times and locations of classes can be found on myUNSW under Class Timetable.

The expected engagement for all UNSW 6UOC courses is 150 hours per term. This includes lectures, tutorials, readings, and completion of assessments and exam preparation (if relevant).

Course Resources

Prescribed Resources

Prescribed resources for this course are provided on the course Moodle page.

Recommended Resources

Recommended resources for this course are provided on the course Moodle page.

Additional Costs

There are no additional costs associated with this course.

Course Evaluation and Development

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

We use student feedback from myExperience surveys to develop and make improvements to the

course each year. We do this by identifying areas of the course that require development from both the rating responses and written comments. Please spare a few minutes to complete the myExperience surveys for this course posted at the top of the Moodle page at the end of term.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Renee Whan		418 Lowy Cancer Research Centre	90651823	• Monday to Friday 10:00 to 17:00 (Sydney time) • By appointment, requests via email.	Yes	Yes
	Edna Hardeman		Level 2 Wallace Wurth	9065 9653	Availability section optional recommended text may include: • Monday to Friday 09:00 to 17:00 (Sydney time) • By appointment, requests via email.	No	No
	Peter Gunning		Level 2 Wallace Wurth	90655654	• Monday to Friday 09:00 to 17:00 (Sydney time) • By appointment, requests via email.	No	No
Lecturer	Michael Carnell		Level 2 Biosciences South	0499050287	• Monday to Friday 09:00 to 17:00 (Sydney time) • By appointment, requests via email.	No	No
	John Lock		Level 2 Wallace Wurth	938 50016	• Monday to Friday 09:00 to 17:00 (Sydney time) • By appointment, requests via email.	No	No
	Daniel Moses		Prince of Wales Hospital	93820315	• By appointment, requests via email.	No	No

Other Useful Information

Academic Information

As a student of UNSW Medicine & Health you are expected to familiarise yourself with the contents of this course outline and the UNSW Student Code and policies and procedures related to your studies.

Student Code of Conduct

Throughout your time studying at UNSW Medicine & Health, you share a responsibility with us for maintaining a safe, harmonious and tolerant University environment. This includes within the courses you undertake during your degree and your interactions with the UNSW community, both on campus and online.

The UNSW Student Code of Conduct website provides a framework for the standard of conduct expected of UNSW students with respect to both academic integrity and your responsibility as a

UNSW citizen.

Where the University believes a student may have breached the code, the University may take disciplinary action in accordance with the Student Misconduct Procedure.

The Student Conduct and Integrity Office provides further resources to assist you to understand your conduct obligations as a student at UNSW.

Academic Honesty and Plagarism

Academic integrity

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to the principle of academic integrity, and ethical scholarship of learning is fundamental to your success at UNSW Medicine & Health.

Plagiarism, contract cheating, and inappropriate use of generative AI undermine academic integrity and are not tolerated at UNSW. For more information see the Academic Integrity and Plagiarism toolkit.

In addition to the information you are required to review in your ELISE training, UNSW Medicine & Health strongly recommends that you complete the Working with Academic Integrity module before submitting your first assessment task.

Referencing

Referencing is a way of acknowledging the sources of information that you use to research your assignments. Preferred referencing styles vary among UNSW Medicine & Health disciplines, so check your course Learning Management System (e.g. Moodle or Open Learning) page for information on preferred referencing styles.

For further information on referencing support and styles, see the Current Student Referencing page.

Academic misconduct and plagiarism

At UNSW, academic misconduct is managed in accordance with the Student Misconduct Procedure. Allegations of plagiarism are generally handled according to the UNSW Plagiarism

Management Procedure. Plagiarism is defined in the UNSW Plagiarism Policy and is not tolerated at UNSW.

Use of Generative AI and other tools in your assessment

UNSW has provided guiding statements for the use of Generative AI in assessments. This will differ, depending on the individual assessment task, your course requirements, and the course stage within your program.

Your course convenor will outline if and how you can use Generative AI in each your assessment tasks. Options for the use of generative AI include: (1) no assistance; (2) simple editing assistance; (3) planning assistance; and (4) full assistance with attribution.

You may be required to submit the original generative AI responses, or drafts of your original work. Inappropriate use of generative AI is considered academic misconduct.

See your course Moodle (or Open Learning) page for the full instructions for individual assessment tasks for your course.

Submission of Assessment Tasks

Short extensions and special consideration

Short extension

Commencing in Term 1, 2024, UNSW has introduced a short extension procedure for submission of assessment tasks. Not all tasks are eligible, and eligible tasks have a predetermined extension length. UNSW Medicine and Health have set School-level extension lengths for eligible assessment tasks. See your course assessment descriptions for more information.

Students must check the availability of a short extension in the individual assessment task information for their courses.

Short extensions do not require supporting documentation. They must be submitted before the assessment task deadline. No late applications will be accepted.

Late penalties apply to submission of assessment tasks without approved extension.

Special consideration

In cases where short term events beyond your control affect your performance in a specific assessment task you may formally apply for Special Consideration through myUNSW.

UNSW has a **Fit to Sit rule**, which means that by sitting an examination on the scheduled date, you are declaring that you are fit to do so and cannot later apply for Special Consideration. Examinations include centrally timetabled examinations and scheduled, timed examinations and tests managed by your School.

Important information relating to Short Extension and Special Consideration is available here, including eligibility for Special Consideration, circumstances where students with Equitable Learning Plans can apply for Short Extensions and Special Consideration, and the appeals process.

Examinations

Information about the conduct of examinations in your course is provided on your course Moodle page.

Timed online assessment tasks

If you experience a technical or connection problem during a timed online assessment, such as a timed quiz, you can apply for Special Consideration. To be eligible to apply you need to contact the Course Convenor and advise them of the issue immediately. You will need to submit an application for Special Consideration immediately, and upload screenshots, error messages or other evidence of the technical issue as supporting documentation. Additional information can be found on: https://student.unsw.edu.au/special-consideration

Other assessment tasks

Late submission of assessment tasks

UNSW has standard late submission penalties as outlined in the UNSW Assessment Implementation Procedure, with no permitted variation. All late assignments (unless extension or exemption previously agreed) will be penalised by 5% of the maximum mark per calendar day (including Saturday, Sunday and public holidays).

Late submissions penalties are capped at five calendar days (120 hours). This means that a student is not permitted to submit an assessment more than 5 calendar days (120 hours) after the due date for that assessment (unless extension or exemption previously agreed).

Failure to complete an assessment task

You are expected to complete all assessment tasks for your courses. In some courses, there will be a minimum pass mark required on a specific assessment task (a “hurdle task”) due to the need to assure clinical competency.

Where a hurdle task is applicable, additional information is provided in the assessment information on your course Moodle page.

Feedback on assessments

Feedback on your performance in assessment tasks will be provided to you in a timely manner. For assessment tasks completed within the teaching period of a course, other than a final assessment, feedback will be provided within 10 working days of submission, under normal circumstances.

Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Any variation from the above information that is specific to an assessment task will be clearly indicated in the course and assessment information provided to you on your course Moodle (or Open Learning) page.

Faculty-specific Information

Additional support for students

The university offers a wide range of support services that are available for students. Here are some links for you to explore.

- The Current Students Gateway: https://student.unsw.edu.au
- Academic Skills and Support: https://student.unsw.edu.au/academic-skills
- Student support: https://www.student.unsw.edu.au/support
- Student Wellbeing, Health and Safety: https://student.unsw.edu.au/wellbeing

Mind Smart Guides are a series of mental health self-help resources designed to give you the

psychological flexibility, resilience and self-management skills you need to thrive at university and at work.

- Mind Smart Guides: https://student.unsw.edu.au/mindsmart
- Equitable Learning Services: https://student.unsw.edu.au/els
- Guide to studying online: https://www.student.unsw.edu.au/online-study

Most courses in UNSW Medicine & Health use Moodle as your Learning Management System. Guidance for using UNSW Moodle can be found on the Current Student page. Difficulties with Moodle should be logged with the IT Service Centre.

- Moodle Support: https://student.unsw.edu.au/moodle-support

The IT Service Desk is your central point of contact for assistance and support with remote and on-campus study.

- UNSW IT Service Centre: https://www.myit.unsw.edu.au/services/students

Course evaluation and development

At UNSW Medicine & Health, students take an active role in designing their courses and their overall student experience. We regularly seek feedback from students, and continuous improvements are made based on your input. Towards the end of the term, you will be asked to participate in the myExperience survey, which serves as a source of evaluative feedback from students. Your input to this quality enhancement process is valuable in helping us meet your learning needs and deliver an effective and enriching learning experience. Student responses are carefully considered, and the action taken to enhance educational quality is documented in the myFeedback Matters section of your Moodle (or Open Learning) course page.

School-specific Information

Laboratory or practical class safety.

For courses where there is a laboratory or practical-based component, students are required to wear the specified personal protective equipment (e.g., laboratory coat, covered shoes, safety glasses) indicated in the associated student risk assessments. The student risk assessments

will be provided on the course Moodle page and must be read and acknowledged prior to the class.

Master of Science in Health Data Science courses

Courses in the Master of Science in Health Data Science are hosted through Open Learning. Additional resources are available on the Health Data Science Student Hub.

School Contact Information

School guidelines on contacting staff:

Course questions

All questions related to course content should be posted on Moodle (or Open Learning) or as directed by your Course Convenor.

In cases where email communication with course convenors is necessary, we kindly request the following:

- Use your official email address for any correspondence with teaching staff.
- We expect a high standard of communication. All communication should avoid using short-hand or texting language.
- Include your full name, student ID, and your course code and name in all communication.

Our course convenors are expected to respond to emails during standard working hours of Monday to Friday, 9am-5pm.

Administrative questions

If you have an administrative question about your program of study at the School please submit your enquiry online at UNSW Ask Us.

Complaints and appeals

Student complaints and appeals: https://student.unsw.edu.au/complaints

If you have any grievances about your studies, we invite you to address these initially to the

Course Convenor. If the response does not meet your expectations, you may then contact the School Grievance Officer, Prof Nick Di Girolamo (n.digirolamo@unsw.edu.au).

For MSc. HDS students: School Grievance Officer, Dr Sanja Lujic (s.lujic@unsw.edu.au), Centre for Big Data Research in Health