



# Cancer Sciences

Course Outline

Never Stand Still

Medicine

# **CANCER SCIENCES**

(Course Code: PATH 3208)

**(6 UOC)**

SESSION II, 2014

Cancer Sciences Course outline

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## Course Introduction

Cancer Sciences Course (PATH3208) is an undergraduate course for 3<sup>rd</sup> year students. It is run jointly by the Prince of Wales Clinical School (Adult Cancer Program of the Lowy Cancer Research Centre), the School of Medical Sciences (SoMS), and the School of Biotechnology and Biomolecular Sciences (BABS). It aims to help students develop independent research ability, so as to set up a bridge between scientific studies and research practice. It suits all research students, and in particular candidate honours students.

## Course staff

A/Prof Jia-Lin Yang (Course convenor)

Room 209, Lowy Cancer Research Centre, phone: 93859390, e-mail: [j.yang@unsw.edu.au](mailto:j.yang@unsw.edu.au)

Consultation time: Tuesday 2-3pm

Dr Caroline Ford (co-convenor)

Room 211, Lowy Cancer Research Centre, e-mail: [caroline.ford@unsw.edu.au](mailto:caroline.ford@unsw.edu.au)

### School of Medical Sciences

Professor Nicholas Hawkins (Head of School)

Dr Patsie Polly

### School of Biotechnology and Biomolecular Sciences

A/Prof Noel Whitaker (Deputy Head of School)

Prof Marc Wikins (Director of NSW System Biology Initiative)

Dr Louise Lutze-Mann

Dr Helen Speirs

### Prince of Wales Clinical School

Prof Robyn Ward (Head of School)

Prof Phillip Crowe (Head of Department of Surgery)

Prof Phillip Hogg (Director of Lowy Cancer Research Centre)

Prof David Goldstein

Prof Paul Thomas

A/Prof Michael Jackson (Head of Radiation Oncology)

A/Prof Claire Vajdic

A/Prof John Pimanda

Dr Anthony Don

Dr Carl Power (Head of Biomedical Resources and Imaging Laboratory)

Dr Barbara-Ann Adelstein

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## Cancer Sciences Course outline

Dr Luke Hesson  
Dr Phoebe Phillips  
Dr Melvin Chin  
Dr Shing Wong  
Dr Vivien Chin  
Dr Sheri Nixdorf  
Dr Robert Rapkins  
Ms Meg Schneider  
Ms Weini Samuel  
Mr Simon Downes

### **Guest Lecturers/Instructors/tutors**

A/Prof Xuchuan Jiang (School of Materials Science and Engineering)  
Dr Renee Whan (Head of Biomedical Imaging Facility)  
Ms Mita Das (Career and Employment)  
Ms Belinda Allen (Learning & Teaching Unit)

## **Course administration**

Administrative and general problems related to attendance, or the content and conduct of the course, can in the first instance be addressed by consulting one of the course convenors.

### **Course Convenors**

A/Prof Jia-Lin Yang (Convenor): E-mail: [j.yang@unsw.edu.au](mailto:j.yang@unsw.edu.au)  
Dr Caroline Ford (Co-convenor): E mail: [caroline.ford@unsw.edu.au](mailto:caroline.ford@unsw.edu.au)

### **Course Student Advisor**

#### **Ms Carmen Robinson**

Student Advisor, School of Medical Science  
BSB Student Office, Room G27, Ground Floor, Biological Sciences Building  
Email: [Carmen.Robinson@unsw.edu.au](mailto:Carmen.Robinson@unsw.edu.au)  
Phone: 9385-2464

Students wishing to see their tutors or other members of staff should call in at the BSB (BABS/SOMS/BEES) student office and make an appointment with the student support staff. If students have difficulties of a personal nature, they should contact the School of Medical Science Grievance Officer, Dr Priti Pandey.

Should a student feel that there are particular circumstances that have affected their performance in the course, they should lodge an application for special consideration. The procedures involved in this are outlined in the UNSW Student Guide, and special forms are widely available on campus e.g. Student Health Centre, Student Centre. All students in the PATH3208 course are advised that email is the official means by which the Course Convenor and administrative staff will communicate with them. All email

messages will be sent to the student's official UNSW email address (e.g., [z1234567@student.unsw.edu.au](mailto:z1234567@student.unsw.edu.au)). If a student does not wish to use the University email system, they MUST arrange for their official mail to be forwarded to your chosen address. The University recommends that students check their mail at least every other day. Facilities for checking email are available in SoMS, BABS, and in the University library. Further information and assistance is available from DIS-Connect (Phone 9385-1777). The UNSW Library runs free email courses.

## Course Details

This course is offered during session II and has six unit of credit (UOC).

It will involve both individual and group work components related to the development of experimental strategies in cancer research. Group work contributes 30% of all assessment items.

Successful completion of at least 18 UOC from any Level 2 subjects offered by the Faculty of Science or Faculty of Medicine in this or other universities (domestic or overseas) is a prerequisite for enrolment to the course. Given the strong research focus of this course, there is no specific need for prior completion of Stage II or III subjects in Pathology.

## Course Aims

Students undertaking PATH3208 will gain a basic knowledge of cancer biology, including aetiology and risk factors. They will also learn the scientific rationale underpinning current and future practices in cancer management (diagnosis and treatment), and the concept of 'personalised' cancer medicine. At the same time, students will develop an understanding of modern experimental approaches to important questions in common cancers. This will include coverage of the design, measurement and evaluation of translational cancer studies and clinical trials.

A fundamental aim of this course is for students to build an understanding and a disposition as a scientist across the curriculum and co-curriculum integrative learning. Students will identify relevant career goals, and how to accumulate and present evidence of achievement in pursuing these goals through the form of an ePortfolio using the Mahara (or other ePortfolio software) and Moodle systems. Students will be guided to develop the skills to create an individual ePortfolio, which will be a student's own work. Students will select a professional design theme, select and present content, obtain feedback from others, write reflective statements, and use these resources for the tailored cover letter and resume assignment. The ePortfolio will eventually be submitted for assessment.

This course specifically focuses on the design, measurement and evaluation of research projects in the field of human cancer. For those wishing to pursue a career in basic or clinical cancer research, the course will emphasise experimental approaches to cancer aetiology, as well the translational research strategies that use knowledge of cancer biology to improve diagnosis and management of that disease. Similarly, for those who may wish to pursue a career in the health sciences, the course will provide an understanding of cancer research and research methods.

## **Student learning outcomes**

At the completion of this course a successful student will be able to:

1. Describe causes and risk factors for common cancers, and relate these to known pathogenetic mechanisms.
2. Describe current approaches to the diagnosis and treatment of common cancers.
3. Describe research techniques and experimental strategies that are commonly used in both basic and clinical cancer research.
4. Describe how to measure and evaluate common experimental strategies or clinical studies in the field of cancer.
5. Work independently to identify and critically analyse articles from the current cancer research literature.
6. Work as part of a team to identify a valid research question in the field of cancer, and frame it within the context of existing literature.
7. Work as part of a team to design and document a research strategy that will potentially answer that question.
8. Present cancer research questions and research strategies to their peers.
9. Effectively assess research presentations made by their peers.
10. Develop evidence of achievement in relevant career goals, and record this evidence in a personal ePortfolio.

## **Graduate attributes**

Students will be encouraged to develop the following Graduate Attributes by undertaking the selected activities and knowledge content. 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, as well as for creative problem-solving.
3. The ability to engage in independent and reflective learning.
4. The skills of effective communication.
5. The ability to start selective personal career.
6. The ability to create and manage personal ePortfolio to serve for self-directed learning.

## Learning and Teaching Rationale

The intended learning outcomes are achieved through active participation as well as drawing on knowledge of students in a range of areas, including anatomy, pathology, histology, biochemistry, molecular and cellular biology and statistics.

This course has strong self-directed learning approaches, but also emphasises a collaborative, team-based approach to learning and assessment. Students will be encouraged to utilise their allocated teams as study groups. These strategies are designed to assist students in developing the skills that they will need as future members of a multidisciplinary research team, particularly in the setting of translational cancer research institutes, hospital-based cancer diagnostic laboratory and clinical trials organisations.

## Teaching Strategies

The course employs a variety of teaching modes in order to facilitate student learning. These include:

1. A series of 25 lectures (25 hours in total) that introduce key concepts and research techniques, as well as research project design, measurement and evaluation.
2. Four whole class tutorials (8 hours in total) will introduce ePortfolio and how to use the supporting software (the Moodle and Mahara program, which will be used in the course learning, management and assessment). This software will be used to set up a personal ePortfolio, create a cover letter and baseline resume as well as to write specific resumes/cover letters, and explore career options and employability development.

Five small group tutorials (5 hours in total) with specialist facilitating that extend and amplify students' understanding of concepts and material presented in lectures. Small group tutorials will also provide opportunities for progress assessment, with students completing individual and team assessment tasks.

3. Co-curriculum classes (10 hours in total) provide an opportunity for students to visit cancer research institutes, laboratories and hospital departments to experience, identify and apply modern research techniques relevant to human cancer. They also provide an opportunity for students to amplify and extend their understanding of material and concepts covered in lectures and prescribed readings.
4. Individual and group study. Students will undertake individual and group study to complete key assignment tasks throughout the course (see Assessment).

Learning is supported via an e-portfolio module, the Moodle/Mahara system, accessible via student number and zPass at <https://moodle.telt.unsw.edu.au/login/index.php>. A student ePortfolio, individual

feedback and group discussion, course announcements, timetables, lecture slides and other resources will be made available during the course.

## Research opportunities

Opportunities exist for all students wishing to undertake undergraduate and postgraduate cancer research program within the Faculty of Medicine. Information on the research interests of different staff members involved in the course is available through the UNSW Research Gateway (<http://research.unsw.edu.au/>).

Details of the different research units in the Adult Cancer Program of Lowy Cancer Research Centre is available on the website (<http://powcs.med.unsw.edu.au/research/adult-cancer-program>), while information on staff and research groups within the School of Medical Sciences can be found at <http://medicallsciences.med.unsw.edu.au/somswweb.nsf/page/Research>.

Students are also encouraged to communicate with invited guest lecturers that are active in research and clinical practice.

## Assessment

The course covers a significant amount of new material and will require diligence and application to succeed. The learning objectives for each activity provide a focus for study, and should be previewed and reviewed for all activities. Students will take part in (self and peer) assessment together with academic staff.

*The breakdown of assessments in the course is as follows:*

<b>Group work</b>	<b>30%</b>
<i>Literature review (LR)</i>	<i>(15%)</i>
<i>Presentation and ability to answer questions</i>	<i>(15%)</i>
<b>Individual assessments</b>	<b>70%</b>
<i>Questionnaires (1-2) (both beginning and end of the course) (Compulsory)</i>	
<i>End-session MCQ examination</i>	<i>(40%)</i>
<i>ePortfolio</i>	<i>(5%)</i>
<i>Tailored resume and cover letter (online)</i>	<i>(10%)</i>
<i>Quizzes(1-5)</i>	<i>(10%)</i>
<i>Cancer research article analysis</i>	<i>(5%)</i>

## **1. Group project: (30%)**

### **Developing an experimental approach to a valid cancer research question**

Students will undertake this project in a group of four to six students. The groups will be determined in week 1 of the course.

As a group, students will complete two tasks:

#### ***a. Develop and frame the question in a literature review (15%)***

Working as a group and with the guidance of a tutor, students will identify a valid research question for a specific cancer and a research type. Selection of a valid question from the tutor's research field is highly recommended. No group can address a question from the same research **and** tumour type domains as any other group.

The group must produce a literature review of approximately 3000 words (excluding tables, figures and references) ending with hypotheses and aims in about one page for their research project.

#### ***b. Develop and present an experimental approach to the question (15%)***

The presentation of this task will firstly involve a 15 minute oral presentation to the class, followed by a further 10 minutes of questions and discussion. The presentation is about a research project identified from the literature review. This will occur in a lecture theatre format in weeks 10-12. After presentation, modified presentation files in response to onsite feedback from each group are required to be submitted to the course Moodle website.

## **2. Individual assessment: (70%)**

### ***a. Questionnaires (compulsory)***

Students will be required to submit a completed questionnaire at both the beginning and end of the course that identifies their relevant career goals as well as evidence of achievement during the course, which will be used to adjust career development tutorials.

### ***b. Student ePortfolio (5%)***

The ePortfolio is a student self-created and self-managed digital framework where a student will present learning information, achievement and evidence, as well as reflective learning during the session within the course and across courses, in and out of the campus. This work will be assessed and account for 5% of the final course mark.

### ***c. End-session MCQ exam (40%)***

Students will sit an end-session MCQ exam in Week 12. This examination will measure knowledge and concepts learned from all course learning activities including lectures, tutorials and co-curricular classes and account for 40% of the final course mark.

***d. Critical review of a research paper (5%)***

Students will be provided with a research paper in week 2 of the course, and will be required to critically review that paper in terms of specific criteria provided. Each student must submit an individual written report of this appraisal, of approximately 1000 words in length, by the end of week 4 of the course.

***e. Quiz assessments (10%)***

A series of 5 online MCQ quizzes will be held to facilitate and assess student learning, covering all materials within preceding lectures, co-curriculum activities and tutorials. Each assessment will contribute 2% toward the course marks, to a total of 10%.

***f. Resume and cover letter assessment (10%)***

Student will submit a tailored online resume with a specific cover letter against a real job advertisement in cancer research associated fields. This will record evidence of achievement in terms of developing capacities relevant to a career in cancer research.

## **Academic honesty and plagiarism**

The UNSW will not tolerate plagiarism in submitted written work. The University regards this as academic misconduct and imposes severe penalties. Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalised by the award of a score of zero for the assessable work. Significant plagiarism will be directly referred to the Division of the Registrar for disciplinary action under UNSW rules.

The University has implemented new plagiarism guidelines in February 2012.

(<https://www.gs.unsw.edu.au/policy/documents/studentacademicintegrityandmanagingplagiarismguidelines.pdf>)

The attention of students is drawn to the notes on plagiarism from the A-Z student guide on MyUNSW (<https://my.unsw.edu.au/student/atoz/Plagiarism.html>).

What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own.\*

Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;

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- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

[www.lc.unsw.edu.au/plagiarism](http://www.lc.unsw.edu.au/plagiarism)

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

\* Based on that proposed to the University of Newcastle by the St James Ethics Centre, and used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

Appropriate citation of sources therefore includes surrounding any directly quoted text with quotation marks, with block indentation for larger segments of directly-quoted text. The preferred format for citation of references is an author-date format with an alphabetically arranged reference list at the end of the assignment. Note that merely citing textbooks or website URLs is unlikely to yield a reference list of satisfactory standard.

***The internet should be avoided as a primary source of information.*** Inclusion of appropriate journal articles, both primary research publications and reviews, is usually expected.

## Course Design

### Table 1. PATH3208 Course Design and Assessment Planner

Changes in the timetable will be announced on Moodle course site. All locations are to be confirmed.

Week	Lectures	Tutorials	Co-curricular classes	Assessment tasks (% of final mark)
1	L1. Overview of PATH3208	T1  Learning centred ePortfolio  (concept, classification, setting up, writing and assessment; 2 hours)	P1- (A, B, C, D)  A: MSE B: Ramaciotti Centre C: BMIF D: BRIL	1 <sup>st</sup> Compulsory Survey  Set up or access personal ePortfolio, write/edit at least once a week and submit at the end of the course (5%)
	L2. Current progress in cancer biology			
	L3. Colorectal cancer			
2	L4. Breast Cancer	T2 (Group tutorials- Groups 1-12 in pairs in six different rooms; 1 hour)  Intro to cancer research & critical analysis of a research article	P2 - (F1) in ½ class  (ACP, Lowy)	Online Quiz 1 (2%)
	L5. Ovary cancer			
	L6. Lung cancer			
3	L7. Pancreatic cancer	T3  Writing job application documents  (cover letter and resume; 2 hours)	P3 - (A, B, C, D)  A: MSE B: Ramaciotti Centre C: BMIF D: BRIL	Online Quiz 2 (2%)
	L8. Prostate cancer			
	L9. Sarcoma			
4	L10. Glioblastoma	T4 (Group tutorials; 1 hour)  Research topic selection & literature review	P4 - (F2) in ½ class  (ACP, Lowy)	Critical appraisal of a research paper (5%)
	L11. Cancer and coagulation			
	L12. Common lab techniques			
5	L13. Advanced molecular techniques	T5 Interview skills & Mock interview (2 hours)	P5 - (A, B, C, D)  A: MSE B: Ramaciotti Centre C: BMIF D: BRIL	Online Quiz 3 (2%)
	L14. Inherited cancer risk			
	L15. Stem cells & cancer			

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6	L16. Animal models in cancer research	T6 (Group tutorials; 1 hour)  Project design & evaluation	P6 - (Et) in class (WW G2/G4 computer lab)	Online Quiz 4 (2%)
	L17. Stats thinking in design			
	L18. Epidemiology, Environment & Cancer			
7	L19. Biomarkers in diagnosis and therapy	T7  Gathering occupational information (1 hour)	P7 - (A, B, C, D)  A: MSE B: Ramaciotti Centre C: BMIF D: BRIL	Group task: Literature review (15%)
	L20. Clinical trials designs			
	L21. Targeted and anti-metabolic cancer therapies			
8	L22. Nano-oncology and theranostics	T8 (Group tutorials; 1 hour)  Presentation skills & feedback on group project design	P8 - (Ht) in class (Lecture theatre, POWCS)	Online Quiz 5 (2%)
	L23. Surgery			
	L24. Radiotherapy			
9	L25. Chemotherapy	T9 *LGM: experience real research meeting again and learn how to find opportunities doing postgraduate studies in the future (1 hour)	P9 - (G1) in ½ class (Radiation Oncology, POWH)	Cover letter & Specific Resume (10%)
10	Presentation 1		P10 - (G2) in ½ class (Radiation Oncology, POWH)	Group task: project design oral presentations (15%)  2 <sup>nd</sup> compulsory survey
	Presentation 2			
	Presentation 3			
11	Presentation 4			Course feedback
	Presentation 5			
	Presentation 6			
12		End course online exam		Course final online examination (40%)
SV1				
SV2				

\*LGM=local group meeting, in which the group of students join their tutor's research group meeting.

**Table 2. PATH3208 Course Title of Lectures, Tutorials and Co-curricular classes**

<b>Name</b>	<b>Title</b>
L01	Overview of Cancer Sciences (PATH3208)
	<i>Specific cancers for identification of a valid research question</i>
L02	Breast cancer
L03	Colorectal cancer
L04	Pancreatic cancer
L05	Ovary cancer
L06	Lung cancer
L07	Neurological cancer
L08	Prostate cancer
L09	Sarcoma
L10	Cancer and coagulation
	<i>Carcinogenesis and Cancer Research</i>
L11	Current progress in cancer biology
L12	Inherited cancer predisposition
L13	Stem cells and cancer
	<i>Biotechnologies and Cancer Research</i>
L14	Common laboratory techniques
L15	Advanced molecular techniques for cancer research
L16	Animal models in cancer research
	<i>Project Design and Review</i>
L17	Statistical thinking in project design, data measurement and evaluation
L18	Epidemiology, risk factors and environmental carcinogenesis
L19	Personalised cancer therapy, predictive and prognostic markers
L20	Clinical trials and study designs
	<i>Cancer Therapeutics</i>
L21	Nanooncology and theranostics
L22	Targeted and antimetabolic cancer therapies
L23	Principles of cancer surgery
L24	Radiotherapy and functional imaging
L25	Principles of chemotherapy
	<i>Basic Laboratories and Cancer Clinical Centres</i>
CCC A	Nanoparticles for biomedical application
CCC B	Advanced molecular technology
CCC C	Live cell imaging and confocal microscopy
CCC D	Animal Imaging
CCC E	Applied medical statistics
CCC F	Common techniques in basic cancer research

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CCC G	Radiation practice
CCC H	Surgery for cancer
<i>ePortfolio, professional and career development learning</i>	
Tut 1	ePortfolio
Tut 2	Introduction to cancer research and critical analysis
Tut 3	Cover letter and resume
Tut 4	Research topic selection and literature review
Tut 5	How to prepare for and perform in a job interview
Tut 6	Project design, measurement and evaluation
Tut 7	How to gather occupational information
Tut 8	Presentation skills and feedback on group project design
Tut 9	Attending tutor's workgroup meeting

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CCC=Co-curriculum class

## Resources for students

### Textbooks

Students are expected to access the following text:

**The Biology of Cancer.** Robert A Weinberg, ©2007, Garland Science, Taylor & Francis Group LLC. ISBN 0-8153-4076-1 (soft cover) or ISBN 0-8153-4078-8 (hard cover).

### PATH 3208 Web site and ePortfolio software

Students enrolled in the PATH 3208 course will be able to access the timetable, lecture notes and related information via Moodle course site at <https://moodle.telt.unsw.edu.au/login/index.php>, using their student number as the user name (e.g. z1234567) and their zPass as the password. Students are expected to visit this site regularly during the course.

The ePortfolio assignment (student's own work for at least fortnightly recording information, description, reflection, resources, and accomplishment and assessment) will be applied in the Cancer Sciences Course for the purpose of improvement of student self-directed co-curriculum learning.

The Moodle and Mahara software incorporated in the Moodle at the Cancer Sciences (PATH3208) course site (<https://moodle.telt.unsw.edu.au/login/index.php>) can be used for this purpose.

User help/service will be described in the relevant tutorials and accessed from the UNSW teaching gateway: Moodle support for students (<http://teaching.unsw.edu.au/moodle-students>) and Mahara open source ePortfolios in Moodle (<http://teaching.unsw.edu.au/moodle-mahara-eportfolios>).

## **Administrative matters**

Administrative questions related to this course should be directed to the SOMS Student Advisor, Ms Carmen Robinson.

Ms Robinson is responsible for administration of undergraduate programs, and student support within the School of Medical Sciences.

Location: BSB Student Office (for students in BABS, SOMS and BEES), Room G27, Ground floor Biological Sciences Building (D26)

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