



Faculty of Medicine  
School of Medical Sciences

DEPARTMENT OF PHARMACOLOGY

# PHAR 3251

# Clinical and Experimental Pharmacology

COURSE OUTLINE

Term 1, 2021

CRICOS Provider Code: 00098G

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Please read this outline in conjunction with the following pages on the

[School of Medical Sciences website:](#)

- [Advice for Students](#)
- [Learning Resources](#)

(or see "STUDENTS" tab at [medicallsciences.med.unsw.edu.au](http://medicallsciences.med.unsw.edu.au) )

## **PHAR3251 COURSE INFORMATION**

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Clinical & Experimental Pharmacology (PHAR3251) is a 3<sup>rd</sup> year Science Course worth Six Units of Credit (6 UOC). The course is usually undertaken as part of a major in Pharmacology for the Bachelor of Science (Adv.) or Bachelor of Medical Sciences or as part of the Bachelor of Medicinal Chemistry. The course builds on the information you have gained in Pharmacology (PHAR2011) and Physiology (PHSL2101). Students are also highly recommended to take PHSL2201 as well as Biochemistry (BIOC2101/2181) and Molecular Biology (2201/2291) or Chemistry (2021/2041).

The PHAR3251 course deals with the pharmacology of different drug classes, with an emphasis on the mode of drug action and adverse drug effects. Effects of drugs on the major organ systems will be covered, focusing on the cardiovascular and endocrine systems, as well as anti-cancer therapies. Students will be introduced to emerging therapeutic strategies based on advances in understanding cellular physiology and drug action. The practicals will cover basic pharmacological methods from both clinical and experimental standpoints.

## **OBJECTIVES OF THE COURSE**

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Building on basic pharmacology skills learned in PHAR2011, the objectives of this course are to:

- a) provide both knowledge and conceptual understanding of the use and action of various classes of drugs in the treatment of different human diseases,
- b) introduce and develop an understanding of the use of selected formulae to predict drug concentration in, and clearance from, the human body,
- c) develop an appreciation of the need for further research to identify new drug targets for more effective therapies.

## **COURSE CONVENERS and LECTURERS:**

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Course Convener: Dr. Matthew Perry

[m.d.perry@unsw.edu.au](mailto:m.d.perry@unsw.edu.au)

Wallace Wurth Building, level 3E, phone: 02 9385 1336

Co-Convener: Dr Marty Le Nedelec

[m.lenedelec@unsw.edu.au](mailto:m.lenedelec@unsw.edu.au)

Wallace Wurth Building, level 3E, phone: 0484 10 70 19

Students wishing to see the course staff should make an appointment via email as our offices are not readily accessible. We will organize to meet you in a convenient location elsewhere in the building.

Lecturers in this course:

Dr Matthew Perry	<a href="mailto:m.d.perry@unsw.edu.au">m.d.perry@unsw.edu.au</a>
Dr Marty Le Nedelec	<a href="mailto:m.lenedelec@unsw.edu.au">m.lenedelec@unsw.edu.au</a>
Dr Angela Finch	<a href="mailto:a.finch@unsw.edu.au">a.finch@unsw.edu.au</a>
Dr Trudie Binder	<a href="mailto:w.binder@unsw.edu.au">w.binder@unsw.edu.au</a>
Prof Margaret Morris	<a href="mailto:m.morris@unsw.edu.au">m.morris@unsw.edu.au</a>
Dr Greg Smith	<a href="mailto:g.smith@unsw.edu.au">g.smith@unsw.edu.au</a>
Prof Nigel Turner	<a href="mailto:n.turner@unsw.edu.au">n.turner@unsw.edu.au</a>
A/Prof Jeff Holst	<a href="mailto:j.holst@unsw.edu.au">j.holst@unsw.edu.au</a>
Dr David Jacques	<a href="mailto:d.jacques@unsw.edu.au">d.jacques@unsw.edu.au</a>

## **COURSE STRUCTURE and TEACHING STRATEGIES**

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This is a 6-unit course and consists of:

- 2-3 topics per week (online modules and pre-recorded lectures)
- Online Q & A sessions (periodically through the term, Tuesday 11-11.30 am)
- Collaborative learning tutorials (online, one hour per week)
- Practical sessions (online or on campus, three hours per week)
- Four assessment tasks (mid-term progress exam; poster presentation; written report; final examination)

Students are expected to actively engage with all scheduled activities for their full duration. Students are reminded that UNSW recommends that a 6 units-of-credit course should involve about 125-150 hours of study and learning activities. The formal learning activities are approximately 70 hours throughout the term and students are expected (and strongly recommended) to do at least the same number of hours of additional study.

Online modules and pre-recorded lectures will provide you with the concepts and theory essential for understanding the mechanism of action and clinical effects of major drug classes. For each disease, the pathological process will be outlined, the relevant drug targets in the disease process will be identified, and current pharmacological treatments will be described. While topics will focus on the mechanism of action and adverse effects of drugs currently in use, potential new therapies or drug targets requiring further research for more effective therapies will be identified and discussed. Q & A sessions will be held periodically throughout the term, allowing students to ask questions regarding the online content. Students will be notified when Q & A sessions are scheduled. These sessions will be held on Tuesdays at 11 am. If a live lecture is scheduled, it will take place on Tuesday 11 am – 12 pm, students will be notified in advance that a live lecture is scheduled.

To assist in the development of research and analytical skills, practical classes and collaborative learning tutorials will be held. These classes allow students to engage in a more interactive form of learning than is possible in the online content. The skills you will learn in practical classes are relevant to your development as professional scientists. The practicals and collaborative learning tutorials are provided to support the online material and to help students develop graduate attributes A, C, D & E. Students will be required to submit a written report for one of the practical sessions.

## **APPROACH TO LEARNING AND TEACHING**

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The learning and teaching philosophy underpinning this course is centred on student learning and aims to create an environment which interests, challenges, and enthuses students. The teaching is designed to be relevant and engaging in order to prepare students for future careers in pharmacology or related disciplines.

Although the primary source of information for this course is the online material, effective learning can be enhanced through self-directed use of other resources such as textbooks and Web based sources. The practical classes and collaborative learning tutorials will be directly related to the online content and it is essential to prepare for these classes before attending. It is up to you to ensure you perform well in each part of the course; preparing for classes; completing assignments; studying for exams and seeking assistance to clarify your understanding.

## TEXTBOOK AND READING LIST

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Recommended Primary Texts:

- Katzung GG. Basic & Clinical Pharmacology. 14th Edition (2018); New York: McGraw-Hill.
- Brunton LL, Hilal-Dandan R, Knollmann BC. Goodman and Gilman's the Pharmacological Basis of Therapeutics. 13th Edition (2018). New York: McGraw-Hill Medical.

Textbooks will be available at the UNSW bookshop. They are also available in print and online formats from the library. Links to additional sources to supplement the material covered in the lectures will be placed on the lecture pages on Moodle.

## STUDENT LEARNING OUTCOMES

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PHAR3251 will develop those attributes that the Faculty of Science and the Department of Pharmacology has identified as important for a pharmacology science graduate to attain. These include: skills, qualities, understanding and attitudes that promote lifelong learning that students should acquire during their university experience.

### Pharmacology Learning Outcomes:

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- Demonstrate an understanding of how drugs/therapeutics are developed, work and are used safely.
- Critically analyse, interpret and effectively communicate pharmacology data and literature.
- Design and/or execute experiments or other activities to address pharmacological scenarios.

### Graduate Learning Outcomes:

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1. Demonstrate an understanding of the clinical application of a range of drug classes.
2. Describe the mechanism of action of specified drug classes used to treat the major types of disease.
3. Accurately perform experiments, record data, draw conclusions from experimental data and write up a scientific report.
4. Demonstrate their ability to work in teams and communicate scientific information effectively to a variety of audiences and in a variety of formats.

See also: [UNSW Graduate Outcomes](#)

## ASSESSMENT PROCEDURES

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Assessment:	Date due	% final mark
Progress exam (50 min duration)	15/03/2021	15%
Written practical report	09/04/2021	15%
Student poster presentation	22/04/2021	15%
End of session examination (2 hours duration)	TBA	55%
Formative assessment (online)	08/03/2021	0%

Written assessment tasks must be submitted electronically via Moodle, through Turnitin. **A penalty will apply for late submissions (10% per day).**

### **Progress examination**

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The mid-term progress exam will be held online in week 5, on the 15<sup>th</sup> of March at 3 pm. This exam will give you feedback on how you are succeeding in the course. The progress examination and end of session examination will test not only your knowledge of drugs used to treat important diseases but also your ability to apply the knowledge you have acquired from multiple lectures to identifying areas of research on appropriate drug targets. The examinations will be in the form of multiple-choice questions and short answer questions. The questions will be based on the material covered in the online content, practical classes and collaborative learning tutorials. Material covered prior to the progress exam may be again examined in the final exam. The progress exam will address graduate learning outcomes 1 and 2.

### **Practical Report**

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The practical report will be written individually, using class data generated and analysed in the practical classes. You will be given instruction on how to prepare your report for submission via Moodle, as well as in the practical class in week 7.

This assessment task will address graduate learning outcomes 1, 2, 3 and 4.

A PDF version of the practical report must be submitted via Moodle through Turnitin, before 10 am on Friday the 9<sup>th</sup> of April 2021 (week 8). There will be a “10% mark deduction per day penalty” for late submission unless the course co-ordinator has approved special consideration. Information for the practical report (structure, marking criteria etc.) will be posted on Moodle.

### **Student poster presentation**

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Students will work in teams to research their topic for presentation as a scientific poster. The poster will be displayed online during a poster presentation and viewing session on Thursday 22<sup>nd</sup> of April 2021. You will be expected to answer questions relating to the topic both individually and as a group. All members of the group will be required to participate in the presentation.

The poster presentation will be graded on scientific content, visual communication and verbal presentation by two academic / research staff. Poster titles (topics) will be made available by week 3. This assessment task will allow you to develop your research, information literacy, communication and time management skills, as well as allowing you to demonstrate your ability to work in a team and collaborate successfully (Graduate learning outcomes 1, 2, 3 and 4). Information for the poster presentation (topic titles, marking criteria etc.) will be posted on Moodle. An information session on ‘Scientific communication: posters’ will occur during the practical class in week 1. A collaborative learning tutorial in week 5 will allow groups to ask questions and receive feedback on their poster drafts.

### **Final Exam**

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The final examination will be held during the official examination period and will consist of 20 multiple choice questions and 10 short answer questions.

Final exam period for Term 1, 2021 is Friday, 30<sup>th</sup> April to Thursday, 13<sup>th</sup> May.

Supplementary exam period for Term 1, 2021 is Monday, 24<sup>th</sup> May to Friday, 28<sup>th</sup> May.

## **Formative assessment**

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The formative assessment is in the form of online questions, which are created to help you revise before the progress examination. You will receive assessment results and feedback immediately once the task is completed and questions will cover material during the first three weeks of the course. The online questions will address graduate learning outcomes 1 and 2, as well as providing you feedback on how you are progressing in the course.

## **COURSE EVALUATION AND DEVELOPMENT**

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Each year feedback is sought from students about the courses offered in the Department of Pharmacology and continual improvements are made based on this feedback. The UNSW MyExperience survey is the way in which student feedback is evaluated and significant changes to the course will be communicated to subsequent cohorts of students. Also, a staff-student liaison group will be set up and students are invited to become class representatives, in which they seek feedback from their colleagues and meet with academic staff to discuss any issues that arise. Based on feedback given in these meetings changes will be implemented during the course and for future years. We appreciate student feedback because we are always looking for ways to improve your learning experience in this course. Below is a summary of the feedback from the previous student cohort in this course and our response to how we improved this year's course delivery.

In 2019-2020, students told us that they liked the teaching structure of PHAR3251. Students commented that the course content was interesting and enjoyable, that they appreciated the clinical focus, and that they thought there was a broad range of topics presented in enough detail to be informative but not overwhelming. Students also commented that they liked the case studies presented in the online content and collaborative learning tutorials.

When asked about what could be improved on the course, the most frequent responses were regarding allowing more time between assessment tasks. In response, we moved the lab report submission to week 8, which is 25 days after the mid-term progress exam in week 5. The group poster presentations will remain on week 10, however, poster topics will be released in weeks 2 or 3, allowing groups 7-8 weeks to complete this assessment task. Student groups will have an opportunity to obtain feedback on their poster drafts in the collaborative learning tutorial in week 5. There will also be an information session on completing the written practical report in the practical session of week 7.

Another comment was that the mid-term progress examination feedback tutorial was not helpful, so feedback for the progress exam will now be provided online in week 7 and students will also have an opportunity to ask questions regarding this feedback in the practical session in week 7.

Finally, students thought that in some lectures there were too many drugs discussed, with insufficient detail regarding the mechanism of adverse effects. Where possible we have reduced the number of drugs discussed or focussed on core first line drugs and have provided more details regarding adverse effects of drugs.

## **GENERAL INFORMATION**

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The Department of Pharmacology is part of the School of Medical Sciences and is within the Faculty of Medicine. It is located in the Wallace Wurth building. General inquiries can be made online via UNSW Student Portal Web Forms: <http://unsw.to/webforms>.

**Professor Margaret Morris** is Head of Department and appointments to meet with her may be made via email ([m.morris@unsw.edu.au](mailto:m.morris@unsw.edu.au)).

***There is an honours program conducted by the School.*** The Honours program is coordinated by Dr Cristan Herbert ([c.herbert@unsw.edu.au](mailto:c.herbert@unsw.edu.au)), Ph: 9385 8679. Any students considering an Honours year should discuss the requirements with the coordinator.

## **Postgraduate degrees**

The Department of Pharmacology offers students the opportunity to enter the following graduate programs:

**Research Masters:** In Pharmacology. Contact the post-graduate co-ordinators A/Prof Pascal Carrive ([p.carrive@unsw.edu.au](mailto:p.carrive@unsw.edu.au)) and Dr Nicole Jones ([n.jones@unsw.edu.au](mailto:n.jones@unsw.edu.au))

**Doctorate (Ph.D):** In Pharmacology. Contact the post-graduate co-ordinators A/Prof Pascal Carrive ([p.carrive@unsw.edu.au](mailto:p.carrive@unsw.edu.au)) and Dr Nicole Jones ([n.jones@unsw.edu.au](mailto:n.jones@unsw.edu.au)).

## **Attendance Requirements**

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For details on the Policy on Class Attendance and Absence see [Advice for Students](#) and the [Policy on Class Attendance and Absence](#).

## **Practical Classes**

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The practical class is an opportunity for students to develop graduate learning outcomes 3 and 4. Students are required to behave in an ethical, socially responsible and professional manner within the practical class.

In 2021, all practical classes will be held online, with the exception of one practical class that which will be held on campus in weeks 3 and 4. The PHAR3251 student cohort will be split into two groups, with half attending the practical class in week 3 and the remaining half attending in week 4. Students who are unable to attend either practical class on campus, due to a valid reason, will attend the practical class remotely at the same time as the students attend on campus.

The pre-lab modules for each practical class must be completed prior to attending each practical class. All pre-lab module questions must be completed before you will be allowed entry into the practical class. Students who do not successfully complete the module will need to do the pre-lab module in class prior to starting the experiment. This policy will be strictly enforced. At the start of each class a member of staff will check that the pre-lab is completed and record your attendance in the class roll.

The pre-lab module will inform you of any hazards in the class and safety procedures to follow to mitigate these hazards. Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. In the interests of safety, special attention should be paid to any precautionary measures recommended in the notes. If any accidents or incidents occur, they should be reported immediately to the demonstrator in charge of the class who will record the incident and recommend what further action is required.

For more details see [Advice for Students-Practical Classes](#)

## **Special Consideration**

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Please see [UNSW-Special Consideration](#) and [Student Advice-Special Consideration](#)

If you unavoidably miss the progress exam in PHAR3251, you must lodge a Special Consideration application online via myUNSW. If your request for consideration is granted an alternative assessment will be organised which may take the form of a supplementary exam or increased weighting of the final exam

## **Student Support Services**

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Details of the available student support services can be found at [Student Advice-Student support services](#).

The following resources can provide help with online learning:



- Transitioning to Online Learning <https://www.covid19studyonline.unsw.edu.au/>
- Guide to Online Study <https://student.unsw.edu.au/online-study>
- UNSW Student Life Hub <https://student.unsw.edu.au/hub#main-content>

### **Appeal Procedures**

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Details can be found at [Student-Advice-Reviews and Appeals](#)

### **Academic Integrity and Plagiarism**

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The School of Medical Sciences 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. Flagrant plagiarism will be directly referred to the Director of Integrity for disciplinary action under UNSW rules.

The [UNSW Student Code](#) outlines the standard of conduct expected of students with respect to their academic integrity and plagiarism. More details of what constitutes plagiarism can be found [here](#).

**PHAR3251 CLINICAL & EXPERIMENTAL PHARMACOLOGY TIMETABLE 2021**

Wk	Date	Learning topics (pre-recorded or online modules)	Q & A (Tues 11-12 am)	Collaborative learning tutorial: Wed 12-1 / 1-2 pm*	Practical: Thurs 3-6 pm (online except wks 3-4 in WW115)	Assessment
1	15/2	Clinical Pharmacology Pharmacokinetics 1 Clinical pharmacokinetics		Clinical case studies	Scientific comms: Posters	
2	22/2	Pharmacokinetics 2 Non-targeted anti-cancer drugs		Pharmacokinetics	Pharmacokinetics	
3	1/3	Targeted anti-cancer drugs Emerging anti-cancer drugs How to write a scientific report		Cancer	Targeted cancer therapy (Group A)	
4	8/3	Reproductive drugs Respiratory drugs		Reproductive	Targeted cancer therapy (Group B)	Online Formative Quiz
5	15/3	Anti-viral drugs		Poster feedback	Cancer therapy analysis	Mid Term Exam (Mon 3 – 4 pm)
6	22/3	<b>Flexibility Week</b>				
7	29/3	Antibiotics Anti-hypertensive drugs		Cardiovascular	Written report	
8	5/4	Heart Failure Lipid lowering drugs		Diuretics	Diuretics	Practical report (due Fri 9/4)
9	12/4	Anti-thrombotic drugs Diabetes		Endocrine	Beta blockers	
10	19/4	Obesity Thyroid / Bone		Experimental Pharmacology	Poster presentations	Posters