



FACULTY OF MEDICINE

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF PHARMACOLOGY

**PHAR 3251**

**Clinical & Experimental Pharmacology**

COURSE OUTLINE

SESSION 1, 2013

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# PHAR3251 Course Information

Clinical & Experimental Pharmacology (PHAR3251) is a 3<sup>rd</sup> year Science Course worth Six Units of Credit (6 UOC). The course is required as part of a major or minor study plan in Pharmacology for the Bachelor of Science or Bachelor of Medical Sciences. The course will build on the information you have gained in Pharmacology (PHAR2011) and Physiology (2101 & 2201) as well as Biochemistry (BIOC2101/2181)) and Molecular Biology (2201/2291) or Chemistry (2021/2041).

## OBJECTIVES OF THE COURSE

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Building on basic pharmacology skills learned in PHAR 2011, the objectives of this course are to a) introduce and develop an understanding of the use of selected formulae to predict drug concentration in, and clearance from, the human body b) provide both knowledge and conceptual understanding of the use and action of various classes of drugs in the treatment of different human diseases and c) develop an appreciation of the need for further research to identify new drug targets for more effective therapies.

## COURSE CO-ORDINATOR and LECTURERS:

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Course Coordinator Dr Trudie Binder  
Rm 408 Level 4 Lowy Cancer Research Institute ph: 9385 8737  
Consultation times: Wednesday 3-4 pm or by appointment.  
Co - Coordinator Dr Ross Grant ph: 9385 3742  
Consultation times: By appointment email or phone.

### Lecturers in this course:

Dr Trudie Binder	<a href="mailto:w.binder@unsw.edu.au">w.binder@unsw.edu.au</a>
Prof Ric Day	<a href="mailto:r.day@unsw.edu.au">r.day@unsw.edu.au</a>
Dr Angela Finch	<a href="mailto:angela.finch@unsw.edu.au">angela.finch@unsw.edu.au</a>
Dr Ross Grant	<a href="mailto:r.grant@unsw.edu.au">r.grant@unsw.edu.au</a>
A/Prof Renate Griffith	<a href="mailto:r.griffith@unsw.edu.au">r.griffith@unsw.edu.au</a>
Dr Mary Kavurma	<a href="mailto:m.kavurma@unsw.edu.au">m.kavurma@unsw.edu.au</a>
Dr Lu Liu	<a href="mailto:lu.liu@unsw.edu.au">lu.liu@unsw.edu.au</a>
Prof Margaret Morris	<a href="mailto:m.morris@unsw.edu.au">m.morris@unsw.edu.au</a>
A/Prof Larry Wakelin	<a href="mailto:l.wakelin@unsw.edu.au">l.wakelin@unsw.edu.au</a>

## COURSE STRUCTURE and TEACHING STRATEGIES

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This is a 6 unit course and consists of:

- 2 lectures per week
- practical/tutorial sessions of up to 4 hours per week.

Students are expected to attend all scheduled activities for their full duration. Students are reminded that UNSW recommends that a 6 units-of-credit course should involve about 150-180 hrs of study and learning activities. The formal learning activities are approximately 76 hours throughout the semester and students are expected (and strongly recommended) to do at least the same number of hours of additional study.

Lectures will provide you with the concepts and theory essential for understanding the mechanism of action and clinical effects of drug classes. For each disease the pathological process will be outlined in the lecture and the relevant drug targets in the disease process identified and current pharmacological treatments will be described. While lectures will focus on the mechanism of action and adverse effects of drugs currently in use, potential new therapies, drug targets and areas requiring further research for more effective therapies, will be identified and discussed.

To assist in the development of research and analytical skills practical classes and tutorials will be held. These classes and tutorials allow students to engage in a more interactive form of learning than is possible in the lectures. The skills you will learn in practical classes are relevant to your development as professional scientists.

## **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.

Although the primary source of information for this course is the lecture material, effective learning can be enhanced through self-directed use of other resources such as textbooks and Web based sources. Your practical classes will be directly related to the lectures and it is essential to prepare for practical classes before attendance. 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.

## **STUDENT LEARNING OUTCOMES**

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

### Graduate Attributes

- A. Research, inquiry and analytical thinking abilities
- B. The capability and motivation for intellectual development
- C. Ethical, social and professional understanding
- D. Effective communication
- E. Teamwork, collaborative and management skills
- F. Information Literacy – the skills to locate evaluate and use relevant information.

On completion of this subject students should:

1. be able to list examples of generic drugs used to treat major classes of disease.
2. be able to outline the mechanism of action of specified drug classes used to treat the major types of disease.
3. be able to communicate scientific information in a report.
4. be able to demonstrate their ability to work in teams and communicate scientific information effectively.

<b>ASSESSMENT PROCEDURES</b>	<b>Date due</b>	<b>% final mark</b>
Progress exam (40 min duration)	17 April	<b>15%</b>
Practical assessment (1 <sup>st</sup> report, $\beta$ -Blockers)	2 weeks after practical analysis	<b>10%</b>
Practical assessment (2 <sup>nd</sup> report, Pharmacokinetics)	2 weeks after practical	<b>5%</b>
Student poster presentation	17 May	<b>10%</b>
End of session examination (2 hours duration)	TBA	<b>60%</b>

The *practicals and tutorials* are provided to support lecture material and practise analytical skills. The practical classes and tutorials help you to develop graduate attributes A, C, D & E. During the practical course you will be required to submit a written report for two of the practical sessions.

Written assessment tasks must be submitted electronically *via* Blackboard, through Turnitin and a hard copy submitted to G7, Bioscience Building.. A penalty will apply for late submissions (10% per day).

#### *Student poster presentation*

Students will work in teams to research their topic for presentation as a scientific poster. The poster will be displayed during a poster presentation and viewing session. The student will be expected to answer questions relating to the topic both individually and as a group. The poster will be marked on set criteria by 2 academic/research reviewers or staff. 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 attributes A, D, E &F).

The *progress examination* will be held during the session in week 6. 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 major classes of disease but also your ability to apply the knowledge you have acquired from multiple lectures to identifying areas of research on appropriate drug targets. This examination will be in the form of 20 multiple choice questions. The questions will be based on the material covered in the lectures, practical classes and tutorials. Material covered prior to the progress exam may be again examined in the final exam. The exam will address graduate attributes A and B. The end of session examination will be held during the official examination period.

## MARKING CRITERIA FOR $\beta$ -BLOCKER PRAC REPORT

	<b>Exemplary (&gt;8.5)</b>	<b>Very Good (8.4-7.5)</b>	<b>Good (7.4-6.5)</b>	<b>Satisfactory (6.4-5.0)</b>	<b>Unacceptable (&lt;5.0)</b>
<b>Title and Formatting</b> <hr/> <b>/10 x 0.5</b>	Title clearly indicates the subject matter of the paper. Name and student number and department address given. Times roman, 12 font, 1.5 line-spacing, Margins 3 cm. Word count ~ 1500	Title indicates the subject matter of the paper. Name and student number and departmental address given. Minor errors in formatting. Word count ~ 1500	Title indicates the subject matter of the paper. Name and student number and departmental address given. Errors in formatting. Word count ~ 1500	Title does not indicate the subject matter of the paper. Name and student number and departmental address given. Errors in formatting. Word count > 1500	Title, author's name and/or address not given. Formatting requirements not followed. Word count > or < 1500
<b>Introduction</b> ~400 words <hr/> <b>/10 x 2</b>	Concise and clear account of the scientific background and the rationale of the experiment. Final sentence summarises the broad conclusions of the paper	Clear account of the scientific background and the rationale of the experiment. Minor omissions or errors. Final sentence summarises the broad conclusions of the paper	A good introduction of the scientific background and the rationale of the experiment. A few factual error or omissions. Final sentence summarises the broad conclusions of the paper	Some introduction to the scientific background and the rationale of the experiment. More detail needed. Improved summary of the major finding needed.	Lacking detail of the rationale of the experiment and scientific background. Summary of the major finding not given
<b>Methods</b> ~150 words <hr/> <b>/10 x 1</b>	Appropriate detail and referencing of methods used.	Sufficient detail and referencing of methods used. Minor details missing.	Insufficient detail and referencing of methods used. Minor errors.	Methods given but not referenced. Lacks details and has errors.	Methods not written in paragraph style.
<b>Results</b> ~300 words <hr/> <b>/10 x 1</b>	Excellent description of the experimental results. No conclusions or interpretation of results presented. Data analysis was performed correctly	Good description of the experimental results. No conclusions or interpretation of results presented. Minor errors in data analysis.	Good description of the experimental results. Lacks some required detail. No conclusions or interpretation of results presented. A few errors or omissions in data analysis.	Description of the experimental results lacks required detail. Some conclusions or interpretation of results presented. Some errors or omissions in data analysis	No description of results. Results not written in paragraph style. Errors in data analysis. Some data analysis not presented.
<b>Figures &amp; Legends</b> <hr/> <b>/10 x 1</b>	Graph axes labelled and units of measurement given in parentheses. Legends explain the figures in sufficient detail that they can be understood without reference to the text	Graph axes labelled and units of measurement given in parentheses. Legends explain the figures however more detail needed to be understood without reference to the text	Minor errors in graph axes labels and units of measurement. Legends explain the figures however more detail needed to be understood without reference to the text	Errors in graph axes labels and units of measurement. Legends lack the detail needed to be understood without reference to the text	Graphs missing axes labels and units. No figure legends included.
<b>Discussion &amp; Conclusion</b> ~650 words <hr/> <b>/10 x 2.5</b>	Discussion is clear and succinct. Extensive interpretation of the results with reference to previous scientific studies. No re-statement of the results. Main conclusions conveyed in a final paragraph.	Good interpretation of the results, greater reference to previous scientific studies needed. Some re-statement of the results. Main conclusions conveyed in a final paragraph.	Some interpretation of the results, greater reference to previous scientific studies needed. Minor errors in interpretation of the results. Some re-statement of the results. Conclusions conveyed in a final paragraph.	Some interpretation of the results, greater reference to previous scientific studies needed. Errors in interpretation of the results. Some re-statement of the results. Some conclusions conveyed in a final paragraph.	No interpretation of the results with reference to previous scientific studies given. Results presented. Main conclusions not conveyed in a final paragraph.
<b>Referencing</b> <hr/> <b>/10 x 1</b>	In-text citations and reference list follow BJP conventions. Relevant information selected. A wide range of references used.	In-text citations and reference list follow BJP conventions. Relevant information selected. A wider range of references needed.	In-text citations and reference list follow BJP conventions, with minor errors. Relevant information selected. A wider range of references needed.	In-text citations and/or reference do not follow BJP conventions. Relevant information selected. A wider range of references needed.	BJP conventions not followed. Non-peer review sources used. Information in intro/discussion not referenced. A wider range of references needed
<b>Writing Conventions</b> <hr/> <b>/10 x 1</b>	Excellent sentence structure, correct grammar and word usage. Sentences and paragraphs well connected. Appropriate written expression- using discipline specific vocabulary and formal not oral language. Has been proof read.	Good sentence structure, correct grammar and word usage. Sentences and paragraphs well connected. Appropriate written expression- using discipline specific vocabulary and formal not oral language. Proof reading needed to eliminate minor errors.	Good sentence structure, correct grammar and word usage. Sentences and paragraphs not always well connected. Appropriate written expression- better use of discipline specific vocabulary and formal not oral language needed. Proof reading needed to eliminate minor errors.	Poor sentence structure, grammar and word usage. Sentences and paragraphs not well connected. Appropriate written expression- better use of discipline specific vocabulary and formal not oral language needed. Proof reading needed to eliminate errors.	Use of paragraphs and improved sentence structure needed. The report is difficult to read due to poor grammar and word usage. No evidence of proof reading.
<b>Total=</b> <hr/> <b>/100</b>					

## **PHARMACOKINETICS PRACTICAL REPORT**

NOTE: The write up for the **Pharmacokinetics practical** will require you to answer the questions given at the end of the practical only. A formal report write-up as listed above will not be required.

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### **MARKING CRITERIA FOR POSTER**

#### **Academic assessment**

Each Student (group) poster will be graded by 2 different academic/staff according to the marking criteria at the scheduled 'Poster Session'. These marks will be collated by the course coordinator to provide the final grade for the poster.

The group mark will be initially assigned to each member of the group. However an individual's mark may be scaled down depending on their peer assessment (see, 'Group-members evaluation' below).

#### **Poster Titles - 2013**

Posters will be prepared by a group of up to 5 students and will be presented for marking (by 2 reviewers) at the poster session on the 17th of May. The poster presentation will be graded on scientific content, visual communication and verbal presentation.

Poster titles will be made available during week 4 of session 1.

*All members of the group will be required to participate in the presentation.*

Student name: \_\_\_\_\_

Assessor: \_\_\_\_\_

Date: \_\_\_\_\_

**Assessment for Clinical and Experimental Pharmacology Poster**

← Grade →

Facet of Work		<b>Low Quality</b> <i>Students achieves a minimal number of objectives (&lt;50)</i>	<b>Satisfactory</b> <i>Students achieves some of the Objectives (50-64)</i>	<b>Good</b> <i>Students achieves a majority of the original set of objectives (65-74)</i>	<b>Very Good</b> <i>Students achieves the original set of Objectives (75-84)</i>	<b>Exemplary</b> <i>Students achieves beyond the original set of objectives (&gt;85)</i>
<b>A. Students embark on inquiry to determine a need for knowledge</b>	10%	<input type="checkbox"/> Aims/Hypo not clearly stated or inappropriate	<input type="checkbox"/> Aims/Hypo present but not clear, focussed or made explicit	<input type="checkbox"/> Aims/Hypo clearly stated, remain within supervisor guidelines	<input type="checkbox"/> Aims/Hypo clear, focussed and innovative, remains within supervisor guidelines	<input type="checkbox"/> Aims/Hypo` clear, focussed and innovative, extending past supervisor guidelines
	5%	<input type="checkbox"/> Background & relevant works minimally surveyed	<input type="checkbox"/> Background & relevant works superficially surveyed	<input type="checkbox"/> Background & relevant works suitably surveyed	<input type="checkbox"/> Background & relevant works broadly surveyed	<input type="checkbox"/> Background & relevant works broadly surveyed &
<b>B. Students find/generate needed information using appropriate approach</b>  / 10	5%	<input type="checkbox"/> Study relevance vaguely identified	<input type="checkbox"/> Study relevance clearly identified	<input type="checkbox"/> Study relevance s clearly identified and briefly explained	<input type="checkbox"/> Study relevance clearly identified and comprehensively explained	<input type="checkbox"/> Study relevance clearly identified, comprehensively explained and rationale justified
	5%	<input type="checkbox"/> No or inappropriate references used to inform project approach	<input type="checkbox"/> Few appropriate references used to inform project approach	<input type="checkbox"/> Several appropriate references used to inform project approach	<input type="checkbox"/> Numerous appropriate references sources used to inform project approach	<input type="checkbox"/> Numerous appropriate references from a wide range of sources used to inform project approach
<b>C. Students critically evaluate information / data / ideas, their approach, methods and results, and react appropriately</b>	5%	<input type="checkbox"/> Invalid or no critical reasoning	<input type="checkbox"/> Little valid critical reasoning	<input type="checkbox"/> Mostly valid critical reasoning	<input type="checkbox"/> Comprehensive and valid critical reasoning	<input type="checkbox"/> Comprehensive and valid critical reasoning, with strong insight
	5%	<input type="checkbox"/> Project's significance, strengths and weaknesses minimally addressed	<input type="checkbox"/> Project's significance, strengths and weaknesses partially addressed	<input type="checkbox"/> Project's significance, strengths and weaknesses clearly addressed	<input type="checkbox"/> Project's significance, strengths and weaknesses comprehensively addressed	<input type="checkbox"/> Project's significance, strengths and weaknesses comprehensively addressed and circumstantiated
<b>D. Students perform necessary tasks to meet stated project aims and hypotheses</b>	5%	<input type="checkbox"/> Project progress is not satisfactory aligned with respect to aim/hypo	<input type="checkbox"/> Project progress is barely aligned with respect to aim/hypo	<input type="checkbox"/> Project progress is mostly aligned with respect to aim/hypo	<input type="checkbox"/> Project progress is highly aligned with respect to aim/hypo	<input type="checkbox"/> Project progress is exceptionally aligned with respect to aim/hypo
	5%	<input type="checkbox"/> Quality of project outcomes is not sub-standard	<input type="checkbox"/> Quality of project outcomes is acceptable	<input type="checkbox"/> Quality of project outcomes is high	<input type="checkbox"/> Quality of project outcomes is very high	<input type="checkbox"/> Quality of project outcomes is outstanding
	5%	<input type="checkbox"/> Achieved progress is minimally reported	<input type="checkbox"/> Achieved progress is mostly reported	<input type="checkbox"/> Achieved progress is fully reported	<input type="checkbox"/> Achieved progress is fully reported and briefly explained	<input type="checkbox"/> Achieved progress is fully reported and explained in detail
<b>E. Students synthesise, applies and analyses new knowledge creatively</b>  /15	15%	<input type="checkbox"/> Reproduces existing knowledge in prescribed formats with minimal interpretation.	<input type="checkbox"/> Reorganises existing knowledge in standard formats with little interpretation.	<input type="checkbox"/> Synthesises and analyses information to construct emergent knowledge and asks, researchable questions.	<input type="checkbox"/> Synthesises, analyses and applies information/data to fill recognised knowledge gaps and asks rigorous, researchable questions.	<input type="checkbox"/> Synthesise, analyses and apply information/data to fill self-identified gaps or extend knowledge and asks rigorous, researchable questions based on new understandings.



<p><b>F. As a group Students communicate project objectives, and achievements</b></p> <p style="text-align: right;">/ 35</p> <p><b>Total</b></p>	<p><b>10</b> <b>%</b></p> <p><b>5%</b></p> <p><b>10</b> <b>%</b></p> <p><b>10</b> <b>%</b></p>	<p><input type="checkbox"/> Unengaging presentation</p> <p><input type="checkbox"/> Visual and spoken elements are not at all integrated / effective</p> <p><input type="checkbox"/> Ineffective presentation as a group, demonstrated by lack of teamwork in presentation and questions.</p> <p><input type="checkbox"/> Lack of understanding of questions, lack of participation by some group members</p>	<p><input type="checkbox"/> Mildly engaging presentation</p> <p><input type="checkbox"/> Visual and spoken elements are not well integrated /effective</p> <p><input type="checkbox"/> Moderately effective presentation as a group, demonstrated by teamwork in presentation and questions.</p> <p><input type="checkbox"/> Limited understanding and response to questions, lack of participation by some group members</p>	<p><input type="checkbox"/> Engaging presentation</p> <p><input type="checkbox"/> Visual and spoken elements are to some extent integrated /effective</p> <p><input type="checkbox"/> Effective presentation as a group, demonstrated by teamwork in presentation and questions.</p> <p><input type="checkbox"/> Some understanding and intelligible response to questions by all group members</p>	<p><input type="checkbox"/> Strongly engaging presentation</p> <p><input type="checkbox"/> Visual and spoken elements are highly integrated / effective</p> <p><input type="checkbox"/> Highly effective presentation as a group, demonstrated by teamwork in presentation and questions.</p> <p><input type="checkbox"/> Detailed discussion of and understanding to questions by all group members</p>	<p><input type="checkbox"/> Captivating presentation</p> <p><input type="checkbox"/> Visual and spoken elements are highly integrated / effective and innovative</p> <p><input type="checkbox"/> Innovative and highly effective presentation as a group, demonstrated by teamwork in presentation and questions.</p> <p><input type="checkbox"/> Comprehensive and detailed discussion of and understanding to questions by all group member</p>
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## GROUP-MEMBERS EVALUATION (of Poster) FORM

Title of poster: \_\_\_\_\_

Name of student doing the assessment: \_\_\_\_\_

### Instructions

Use this form to evaluate the members of your group. Write the name of each group member, including yourself, in one of the columns, then assign a score of 0 to 10 (0 being the lowest grade, 10 the highest) to each group member for each criterion. Because each group member has different strengths and weaknesses, the scores you assign will differ. At the bottom of this sheet, write down any comments you wish to make.

- Note:
- 1) Each student in the group will complete this evaluation for each member of the group.
  - 2) Students must hand these evaluation forms to the course coordinator during the poster presentation session.
  - 3) While the overall group mark will be set by the 3 academic reviewers this group member evaluation will be used to scale marks within the group as required.
  - 4) An individual's final poster mark will be adjusted if their average peer assessment score is > 15% below the overall average peer assessment score for their group.
- The adjustment will generally be made according to the following formula:

$$\text{Adjusted score} = \frac{\text{Academic poster mark} \times \text{individuals average peer assessment score}}{\text{overall average peer assessment score}}$$

Criteria	Group Members (name)		
Regularly attends meetings			
Is prepared at the meetings			
Meets deadlines			
Contributes good ideas			
Effort given to researching subject			
Submits high-quality work			
Listens to other members			
Give constructive feedback			
Responds to constructive feedback			
<u>Your</u> <b>PEER assessment Score</b> of this person's contribution ( /10)			

Comments:

## TEXTBOOK AND READING LIST

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### **Recommended Primary Text**

Brunton, Parker, Blumenthal, Buxton. Goodman & Gilman's Manual of Pharmacology and Therapeutics. McGraw-Hill 2008

### **Recommended Secondary Text**

Rang, Dale, Ritter and Flower; Pharmacology 7<sup>th</sup> ed. Churchill Livingstone, 20012

### **Other relevant texts**

Katzung; Basic & Clinical Pharmacology, 10<sup>th</sup> ed. McGraw-Hill, 2007

Hardman, Limbird, Molinoff, Ruddon, Gilman. Goodman & Gilman's The Pharmacological basis of therapeutics 10<sup>th</sup> ed. McGraw-Hill

Waller, Renwick Hillier Medical Pharmacology and Therapeutics. 2<sup>nd</sup> ed. Elsevier, Saunders, 2005

Koda-Kimble et al., Applied Therapeutics (The Clinical use of Drugs) 9<sup>th</sup> ed., Lippincott Williams & Wilkins Pty Ltd, 2009

## 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 Course and Teaching Evaluation and Improvement [CATEI] Process of the UNSW 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 student feedback forum will be set up and students will be invited to become class representatives to seek feedback from their colleagues and meet with academic staff to discuss any issues that arise.

Based on feedback from students in 2012 the following changes have been made: The weighting of the end of session final examination has been reduced from 65% to 60%. In addition, extra tutorials have been provided and the Pain pharmacology practical has been replaced with a new practical class 'Topical analgesia/ anaesthesia' to provide an extra 'wet practical' inductive to reasoning in clinical assessment

## 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 on the lower ground, 2<sup>nd</sup> floor of the Wallace Wurth building. General inquiries can be made at the School of Medical Sciences Student Enquires Counter, located on the Ground Floor, Room G27 Biosciences Building. Office hours are 9.00 am - 5:00pm.

**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)).

**Departmental Vacation Scholarships:** The Department of Pharmacology supports several summer vacation scholarships each year to enable good students to undertake short research projects within the department. For further details contact the Administrative Officer.

**There is an honours program conducted by the School.** The Honours program is coordinated by Dr Andrew Moorhouse ([a.moorhouse@unsw.edu.au](mailto:a.moorhouse@unsw.edu.au)), Ph: 938 52575. Any students considering an Honours year should discuss the requirements with the coordinator. Outstanding students may be considered for scholarships offered by the University and these are offered annually.

### **Postgraduate degrees**

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

**Course Work Masters:** Masters in Drug Development. For more information contact Dr John Langlands (j.langlands@unsw.edu.au)

**Research Masters:** In Pharmacology. For more information contact the post-graduate coordinator Dr Pascal Carrive (p.carrive@unsw.edu.au)

**Doctorate (Ph.D):** In Pharmacology. For more information contact the post-graduate coordinator Dr Pascal Carrive (p.carrive@unsw.edu.au)

### **The School Teaching Administrator**

Ms Carmen Robinson is able to provide additional information on any courses offered by the School. Student Enquires Counter, Room G27, Biosciences Building, ph:9385 2464.

Email: Carmen.Robinson@unsw.edu.au

### **OFFICIAL COMMUNICATION BY EMAIL**

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All students in the course PHAR3251 are advised that e-mail is now the official means by which the School of Medical Sciences at UNSW will communicate with you. All e-mail messages will be sent to your official UNSW e-mail address (e.g. z1234567@student.unsw.edu.au) and, if you do not wish to use the University e-mail system, you **MUST** arrange for your official mail to be forwarded to your chosen address. The University recommends that you check your mail at least every other day. Facilities for checking e-mail are available in the School of Medical Sciences and in the University library. Further information and assistance is available from IT at UNSW (<http://www.it.unsw.edu.au/students/index.html>.)

***When contacting a lecturer with a query, it is essential that the following information is provided as a minimum: student name, student number, course number, course name.***

### **ATTENDANCE REQUIREMENTS**

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Attendance at scheduled teaching activities is governed by the University's requirement that students attend at least 80% of all classes.

**Attendance at practical classes is compulsory, and must be recorded in the class roll at the start of each class. It is your responsibility to ensure that the demonstrator records your attendance and no discussions will be entered into after the completion of the class.** Satisfactory completion of the work set for each class is essential. It should be noted that non-attendance for other than documented medical or other serious reasons, or unsatisfactory performance, **for more than 1 practical class during the session** may result in an additional practical assessment exam or ineligibility to pass the course.

The University acknowledges that students are involved in many extra-curricular activities throughout their studies. The School of Medical Sciences is generally supportive of students' activities but must be confident that these do not significantly impact on attendance at scheduled teaching activities or completion of assessment requirements.

Guidelines on extra-curricular activities affecting attendance can be found on the School of Medical sciences Website.

[http://medicallsciences.med.unsw.edu.au/SOMSWeb.nsf/resources/Course+Outline+NEUR+2/\\$file/Ex](http://medicallsciences.med.unsw.edu.au/SOMSWeb.nsf/resources/Course+Outline+NEUR+2/$file/Ex)

## **BEHAVIOUR IN PRACTICAL CLASSES**

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The practical class is an opportunity for students to develop graduate attribute C by behaving in an ethical, socially responsible and professional manner within the practical class.

- Punctual arrival is expected.
- Turn off mobile phones before entering the class.
- A lab coat must be worn to all practical classes
- Enclosed shoes are compulsory.

Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. Those who don't adhere to these basic laboratory rules will be marked absent.

## **PRACTICAL CLASSES**

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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.

### Animal Experimentation

The procedures used in the laboratory classes involving *the use of animals* have been approved by Animal Care and Ethics Committee (registration number ACE04/54B). All experiments undertaken in the Department of Pharmacology adhere to the NHMRC code of conduct for animal experimentation.

## **NOTICEBOARDS**

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Noticeboards for this course can be found on the 2nd floor of the Wallace Wurth building. Current timetables and information relevant to you will be displayed here and on the course page on Blackboard. It is your responsibility to check these regularly.

## **TECHNOLOGY ENABLED LEARNING AND TEACHING RESOURCES**

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The Department of Pharmacology has chosen to use the University's central Blackboard service to provide teaching material for all of its courses.

- To access these materials, either point your browser to: <http://lms-blackboard.telt.unsw.edu.au/webapps/portal/frameset.jsp> or go to the School's home page at: <http://medicalsciences.med.unsw.edu.au/> then select "Current Students" from the menu bar and click on Blackboard, under "Quicklinks" in the left column.
- You will need to click through the "UNSW" at the left, then click the "Log on" button and enter your zPass (zStudentNo. and password).
- After logging on to Blackboard, look for the course PHAR3251. You should have access to it if you are properly enrolled.
- You can make use of Lectopia (formerly iletures) recordings taken of the lectures that are available on Blackboard. Lecture slides will also be made available on Blackboard.

## **HANDWRITING**

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Students whose writing is difficult to understand will disadvantage themselves in their written assessment. Make every effort to write clearly and legibly. Do not use your own abbreviations.

## **SPECIAL CONSIDERATION**

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**Please note the following Statement regarding Special Consideration.**

If you believe that your performance in a course, either during session or in an examination, has been adversely affected by sickness or for any other reason, you should notify the Registrar and ask for special consideration in the determination of your results. Such requests should be made as soon as practicable after the problem occurs. **Applications made more than three days after an examination in a course will only be considered in truly exceptional circumstances.**

When submitting a request for special consideration you should provide all possible supporting evidence (eg medical certificates) together with your registration number and enrolment details. Consideration request forms are available from the Student Centre in the Chancellery and from Course Offices. In exceptional circumstances further assessment may be given. **If you believe you might be eligible for further assessment on these grounds, you should contact the Course Authority or the relevant Course Office as soon as possible.** Please refer to <https://my.unsw.edu.au/student/resources/Policies> for further details regarding special consideration.

## **MISSED EXAMS**

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If in any circumstances you unavoidably miss an examination, you must inform the Registrar and also contact the relevant Course Office immediately. Normally, if you miss an exam (without medical reasons) 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 timetables and ensure that you arrive with sufficient time. **PLEASE NOTE** that if you miss any examinations for medical reasons you must lodge a medical certificate with UNSW Student Central within **3 DAYS** (refer to <https://my.unsw.edu.au/student/atoz/SpecialConsideration.html> for further details). Your request for consideration will be assessed and a deferred exam may be granted. You cannot assume you will be granted supplementary assessment. The deferred exam may include a significant oral element.

**The supplementary exam will be held in the week starting the 8<sup>th</sup> of July, 2013.**

## **MISSED PROGRESS EXAM**

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If you unavoidably miss the progress exam in PHAR3251, you must inform the course coordinator within **3 DAYS**. You must supply adequate documentation (medical certificate) to be considered for any supplementary progress exam.

## **MEDICAL CERTIFICATES**

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Students who miss practical classes due to illness or for other reasons must submit a copy of medical certificates or other acceptable documentation to the course coordinator. **Certificates should be lodged no more than 7 days after an absence. Certificates lodged after 7 days will not be accepted.** The following details must be attached: Name, Subject number, Group number, Date of the class, Name of class/es missed.

## **STUDENT SUPPORT SERVICES**

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Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course coordinator prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Student Equity and Disabilities Unit. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

Student Equity and Disabilities Unit, Ground Floor of the Goodsell Building

**Tel:** +61 2 9385 4734/5434

**Email:** [seadu@unsw.edu.au](mailto:seadu@unsw.edu.au)

**Website:** [www.studentequity.unsw.edu.au](http://www.studentequity.unsw.edu.au)

## **STUDENT RIGHTS AND RESPONSIBILITIES**

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<https://my.unsw.edu.au/student/resources/Policies.html#StudentResponsibilities&Conduct>

## **APPEAL PROCEDURES**

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Details can be found at MyUNSW via the Student Central link.

<https://my.unsw.edu.au/student/academiclife/StudentCentralKensington.html>

## **GRIEVANCE RESOLUTION OFFICER**

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In case you have any problems or grievance about the course, you should try to resolve it with the Course Coordinator (Dr Trudie Binder ph:93858737) or the Head of Department (Prof Margaret Morris ph: 9385 1560). If the grievance cannot be resolved in this way, you should contact the School of Medical Sciences Grievance Officer, Dr P.Pandey (9385 2483, [P.Pandey@unsw.edu.au](mailto:P.Pandey@unsw.edu.au)).

## 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. 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. Evidence of plagiarism may result in a record being made in the Central Plagiarism Register and the Faculty Students Ethics Officer being notified.

### 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;
- 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 the 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. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.



## LECTURE AND PRACTICAL CLASS OVERVIEW

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The course timetable is appended at the end of these notes and can also be found on Blackboard.

The course is divided into 4 main themes covering the major diseases and therapeutics;

1. Predicting drug concentrations in the body (pharmacokinetics)
2. Drugs affecting diseases and disorders of major systemic organ systems
3. Infection and antimicrobial drugs
4. Cancer chemotherapy

### **1. Predicting drug concentrations in the body (pharmacokinetics) and drug applications**

#### *Lectures*

Pharmacokinetics (1 & 2)

Drugs for young and old

Topical formulation

#### *Tutorials*

Pharmacokinetics

#### *Practicals*

Pharmacokinetics

Topical anaesthesia / analgesia

### **2. Drugs affecting diseases and disorders of the major systemic organ systems**

#### *Lectures*

Cardiac failure drugs

Antihypertensives

Renal Pharmacology

Lipid lowering drugs

Haemostasis and Thrombosis

Endocrine pharmacology 1&2

Reproductive Pharmacology

Therapeutics of the G.I.T.

Antiarthritic drugs

Respiratory Pharmacology

#### *Tutorials*

Diuretic prac - follow-up tutorial

Autonomic ( $\beta$ blocker) prac - follow-up tutorial

Cardiovascular

Endocrine

#### *Practicals*

$\beta$ -Blocker-effect on heart rate

Diuretic Pharmacotherapy

### **3. Infection and antimicrobial drugs**

#### *Lectures*

Antimicrobial chemotherapy 1&2

Antiviral chemotherapy

Tropical Medicine/Anti-malarial

### **4. Cancer Chemotherapy**

#### *Lectures*

Anticancer drugs 1&2

#### *Tutorials*

Anticancer drugs

### **Anti-Hypertensive Drugs**

Definition of hypertension, primary (essential) and secondary hypertension, consequences of untreated hypertension, guidelines for treating hypertension, non-pharmacological treatment including lifestyle issues, pharmacological treatment including ACE inhibitors, angiotensin 2 receptor blocking agents, diuretics, calcium channel blocking agents and beta receptor blocking agents

### **Cardiac Failure**

Types of heart failure, causes of heart failure, signs and symptoms of heart failure, pathophysiological changes, non-pharmacological treatment, pharmacological treatment including ACE inhibitors, angiotensin 2 receptor blocking agents, diuretics, beta receptor blocking agents, spironolactone and digoxin

### **Renal Pharmacology**

This lecture will outline the role played by the kidney in the development of oedema and hypertension. The mechanism of action of important drug classes that act on the kidney will be outlined and their relative merits in controlling disease will be discussed within the clinical context.

### **Haemostasis and Thrombosis drugs**

This lecture will review the fundamentals of blood coagulation emphasizing primary elements that underlie hemorrhagic and thrombotic disease. Using this as a foundation the lecture will then discuss the role and mechanism-of-action of the anticoagulant, anti platelet and thrombolytic drugs currently used in clinical medicine. Limitations of current anticoagulant and thrombotic therapy and possible new drug targets will then be discussed.

### **Lipid lowering drugs**

Dyslipidaemia is considered a primary contributor to the development of atherosclerosis leading to heart disease. This lecture will outline briefly the pathogenesis of atheroma and the process of lipid transport before discussing the mechanism of action of the major classes of lipid lowering drugs. Limitations of current lipid therapies will be discussed with an emphasis on possible areas of new drug targets.

### **Endocrine 1& 2**

After a brief overview of endocrine function, major issues regarding treatment of endocrine disorders will be addressed. The lecture will focus on two common endocrine disorders, thyroid disease and diabetes. Their epidemiology and rationale for treatment will be discussed, including the adverse effects of therapy. The need for ongoing monitoring of therapy will be highlighted.

### **Reproductive Pharmacology**

This lecture will review the physiological actions of estrogens, progestins and androgens. The molecular basis of their actions at nuclear receptors will be discussed. The clinical uses of these hormones and antagonists of their receptors in contraception, hormone replacement therapy, prostate cancer and benign prostate hypertrophy will be addressed. The treatment of erectile dysfunction will also be

covered

### **Opioids in pain management:**

This lecture encompasses: analgesic agents; historical introduction to the use of opioids, *Papaver somniferum* and opium; mode of action; the opioid receptors; the endogenous opioids; assessment of analgesic activity, pain measurement and pain control; adverse effects; commonly used opioids including, morphine, codeine, pethidine, methadone, heroin, fentanyl, oxycodone, naloxone, and buprenorphine; tolerance, dependence and opioid kinetics.

**Pharmacokinetics 1&2:** These lectures will provide an introduction to the calculation of major pharmacokinetic parameters based on either single or 2 compartment modelling. Parameters covered include; half-life, volume of distribution, clearance, dosing rate, maintenance dose and bioavailability. Numerical examples will be given. The accumulation of drugs and fluctuations in plasma levels during long term drug treatment will be discussed.

### **Respiratory Pharmacology**

This lecture builds upon the concepts encountered in Introductory Pharmacology 'The Pharmacology of asthma'. The lecture will focus on chronic airway limitation, a disease state characterized by airflow limitation that is not fully reversible (unlike asthma) leading to chronic bronchitis's and emphysema. The lecture encompasses bronchodilators, anti-inflammatory drugs, antitussives and respiratory stimulants (analeptic drugs).

### **Antiinflammatory/Antiarthritic Drugs**

This lecture will provide a brief overview of the use of pharmacotherapy in the two types of arthritis broadly classified as inflammatory and non-inflammatory arthritis. The objective of drug therapy in these conditions is for symptom control (pain, stiffness, loss of function) and suppression of disease activity in order to prevent long-term damage. The mechanisms of pain, inflammation and joint damage and the pharmacological approaches to dealing with these will be presented.

### **Therapeutics of the G.I.T.**

The gastrointestinal tract (G.I.T.) is a complex organ system that, in addition to its digestive capability, possesses an extensive neuronal network and major endocrine functions. A wide range of pathologies affect the G.I.T. and contribute significantly to morbidity within the society. This lecture will discuss the rationale for therapy and the mechanism of action of current drugs affecting gastric secretion and motility and will highlight limitations of current therapy and possible new areas for drug targets.

### **Anti Cancer Drugs 1&2**

Cancer biology including epidemiology, incidence and mortality, tumour genetics, apoptosis, metastasis, tumour vasculature, approaches to cancer treatment, reasons for treatment failure, mechanisms of cancer drug resistance, cancer drug classes including antimetabolites, hormones, hormone antagonists, mitotic spindle inhibitors and DNA-binding agents.

## **Antibacterials 1&2**

Lecture 1 covers antibiotic resistance mechanisms and drugs that target DNA biochemistry, including dihydropteroate synthase inhibitors, dihydrofolate reductase inhibitors, and DNA gyrase inhibitors. Lecture 2 addresses cell wall biochemistry and inhibitors of cell wall synthesis (penicillins, cephalosporins, vancomycin), and protein biosynthesis and inhibitors of ribosome function (tetracyclines, aminoglycosides, macrolides).

## **Anti Viral Pharmacotherapy**

A brief overview will be given on viruses and their classification. The infectious process for a virus will be discussed and the biochemical targets for antiviral therapy developed from that discussion, using the Human Immunodeficiency Virus (HIV) as the main example. The major antiviral drug classes will be presented, as well as treatment limitations and failures, highlighting the need for the development of new agents.

## Clinical and Experimental Pharmacology PHAR3251 S1 2013

<b>Wk</b>	<b>Date Week beginning</b>	<b>Lecture 1 Biomed F Tuesday 3-4</b>	<b>Lecture 2 Mathew C Wednesday 2-3</b>	<b>Tutorial Thursday 12-1 Mat 307 or Friday 12-1 Mat 232</b>	<b>Practical Bioscience 329 Friday 2-5</b>
1	4 March	<b>INTRODUCTION</b> T. Binder	<b>Anti Hypertensive drugs</b> M. Morris	Introduction to Practicals / collection of practical manuals –T Binder	
2	11 March	<b>Cardiac failure - drugs</b> M. Morris	<b>Lipid lowering Drugs</b> Mary Kavurma	<b>How to make a poster</b> T. Binder	<b>β-Blocker prac</b> T Binder
3	18 March	<b>Haemostasis and Thrombosis</b> Mary Kavurma	<b>Endocrine Pharmacology – Diabetes</b> M. Morris	<b>Cardiovascular Tut</b> M Morris	<b>β-Blocker prac</b> T Binder
4	25 March	<b>Endocrine Pharmacology 2</b> M. Morris	<b>Renal Pharmacology</b> R. Grant	<b>Endocrine Tut</b> T Binder	Good Friday
<b>Mid Session Break 29<sup>th</sup> March – 7<sup>th</sup> of April</b>					
5	8 April	<b>Reproductive Pharmacology</b> A. Finch	<b>Therapeutics of the G.I.T.</b> L. Liu		<b>β-Blocker analysis</b> T Binder
6	15 April	<b>Respiratory Pharmacology</b> T. binder	<b>Mid session TEST</b> T. Binder	<b>Clinical Pharmacology Tut</b> <b>Case studies</b> T. Binder	<b>β-Blocker analysis</b> A Finch
7	22 April	<b>Pharmacokinetics 1</b> R.Grant	<b>Pharmacokinetics 2</b> R. Grant	Anzac Day (Thurs)	<b>Diuretic prac</b> R.Grant/ T. Binder
8	29 April	<b>Drugs for young and old</b> M. Morris	<b>Opioids in pain management</b> T. Binder	Mid session Test feedback (stats etc) T. Binder	<b>Pharmacokinetics 202</b> T.Binder / R. Grant
9	6 May	<b>Antiinflamm/Antiarthritic drugs</b> R.Day	<b>Topical Formulations</b> R Grant	<b>Diuretic- Tut</b> R. Grant	Poster preparation
10	13 May	<b>Anti-Cancer Drugs 1</b> L. Wakelin	<b>Anti-Cancer Drugs 2</b> L. Wakelin	<b>Pharmacokinetics Tut</b> R. Grant	<b>Poster Presentations</b> <b>All staff</b>
11	20 May	<b>Antimicrobials 1</b> L. Wakelin	<b>Antimicrobials 2</b> L. Wakelin	Anti-inflam tut T. Binder	<b>Topical analgesia 204</b> T.Binder / R. Grant
12	27 May	<b>Tropical Med / Anti-malarial</b> R Griffith	<b>Anti viral chemotherapy</b> R. Griffith	<b>Anti Cancer Tut</b> L.Wakelin	<b>Topical analgesia 204</b> T.Binder / R. Grant
13	3 June			<b>Exam Revision</b> T. Binder	

Inquiries to Dr Trudie Binder: 93858737 email [w.binder@unsw.edu.au](mailto:w.binder@unsw.edu.au) or Dr Ross Grant: 93853742; email: [r.grant@unsw.edu.au](mailto:r.grant@unsw.edu.au)

## Practical Classes

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