



MEDI2004

Pharmacology Fundamentals

Session 2, In person-scheduled-weekday, North Ryde 2026

Macquarie Medical School

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	4
<u>Delivery and Resources</u>	7
<u>Unit Schedule</u>	7
<u>Policies and Procedures</u>	9
<u>Changes from Previous Offering</u>	10
<u>Artificial Intelligence Tools</u>	11
<u>Inclusion and Diversity</u>	11
<u>Professionalism</u>	11

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General Information

Unit convenor and teaching staff

Unit Convenor

Dr Marina Junqueira Santiago

marina.junqueirasantiago@mq.edu.au

Contact via email

Consultation hours: By appointment.

Course Director, Bachelor of Clinical Science.

A/Prof. Mark Butlin

mark.butlin@mq.edu.au

Contact via iLearn message

Level 1, 75 Talavera Rd, Macquarie University.

Consultation hours: By appointment.

Credit points

10

Prerequisites

40cp at 1000 level or above including (BMOL1001 or CBMS104 or CBMS107 or CHEM1001)

Corequisites

MHHS1002 or ANAT1001

Co-badged status

Unit description

This unit will introduce the fundamental principles of drug disposition and action. You will study core pharmacological concepts related to pharmacokinetics (how drugs are absorbed, distributed, metabolised and excreted) and pharmacodynamics (how drugs produce their effects at the molecular, cellular and systems levels). You will build your knowledge of exogenous (from outside the body) and endogenous (from within the body) chemical substances and how they influence human health and disease. You will explore the mechanisms of action and disposition of commonly used therapeutic drug classes, along with factors affecting drug safety and variability in individual responses. The unit also introduces key considerations related to drug development, regulation, and access to traditional and complementary medicine. The topics covered in this unit will help you integrate knowledge from molecular biology, chemistry, biochemistry, and physiology with the science of drugs, and communicate pharmacological information effectively in academic and clinical contexts.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Apply core pharmacological concepts related to pharmacokinetics and pharmacodynamics to explain drug behaviour and effects in the human body. (Scientist and Scholar)

ULO2: Explain the mechanism of action and adverse effects of commonly used therapeutic agents and discuss how drug interactions and individual variability impact drug safety in clinical practice. (Practitioner)

ULO3: Describe the key stages of drug discovery, development and regulatory processes, and identify the challenges affecting equitable access to traditional and complementary medicine. (Citizen)

ULO4: Communicate pharmacological concepts effectively in individual and team settings, using reflective practice to identify and address misconceptions and to evaluate digital tools and emerging technologies. (Professional)

General Assessment Information

Grade descriptors and other information concerning grading are contained in the [Macquarie University Assessment Policy](#).

All final grades are determined by a grading committee, in accordance with the Macquarie University Assessment Policy, and are not the sole responsibility of the Unit Convenor.

Students will be awarded a final grade and a mark, which must correspond to the grade descriptors specified in the [Assessment Procedure](#).

To pass this unit, you must demonstrate sufficient evidence of achievement of the learning outcomes, meet any ungraded requirements, and achieve a final mark of 50 or better.

Further details for each assessment task will be available on iLearn.

Short Extension

The Assessment Task table lists which assessments are eligible for a Short Extension. You can only apply for a Short Extension before the assessment due date. No reason or evidence is required. It will extend the due date by an additional 3 calendar days. You can only receive one Short Extension for each eligible assessment task. Short Extensions are not available if you have already received an IEAP Extension or Special Consideration for that assessment task.

Special Consideration

If you are unable to complete an assessment task on or by the specified date due to circumstances that are unexpected, unavoidable, significantly disruptive and beyond your control, you may apply for special consideration in accordance with the [Special Consideration Policy](#). Applications for special consideration must be supported by appropriate evidence and submitted via connect.mq.edu.au.

Late Submissions

A 5% penalty (OF THE TOTAL POSSIBLE MARK) will be applied each day a written assessment is not submitted, up to the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55 pm. A 1-hour grace period is provided to students who experience a technical concern. Submission of assessments after 7 days can be accepted at the discretion of the unit convenor and may be taken into account in determining whether you have met the learning outcomes of the unit to support passing the unit. Days late will be calculated from the date listed in the Assessment Tasks table, or from the extended due date if a Short Extension or Special Consideration application is accepted.

For example:

Number of days (hours) late	Total Possible Marks	Deduction	Raw mark	Final mark
1 day (1-24 hours)	100	5	75	70
2 days (24-48 hours)	100	10	75	65
3 days (48-72 hours)	100	15	75	60
7 days (144-168 hours)	100	35	75	40
>7 days (>168 hours)	100	—	75	0

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Reflective AI-Enhanced Learning Assignment	15%	No	14/09/2026	Individual	Yes	Open
Group Role Play and viva	35%	No	Week 9	Individual and Group	No	Observed

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
End of session examination	50%	No	Exam Period	Individual	No	Observed

Reflective AI-Enhanced Learning Assignment

Assessment Type ¹: Reflection task

Indicative Time on Task ²: 10 hours

Due: **14/09/2026**

Weighting: **15%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

You will review your formative quiz answers, identify and discuss pharmacology misconceptions, and reflect on your learning process through critical self-assessment. You will also analyse and compare AI-generated answers to deepen your understanding and evaluate the use and limitations of digital technologies (e.g., GenAI tools).

On successful completion you will be able to:

- Apply core pharmacological concepts related to pharmacokinetics and pharmacodynamics to explain drug behaviour and effects in the human body. (Scientist and Scholar)
- Explain the mechanism of action and adverse effects of commonly used therapeutic agents and discuss how drug interactions and individual variability impact drug safety in clinical practice. (Practitioner)
- Communicate pharmacological concepts effectively in individual and team settings, using reflective practice to identify and address misconceptions and to evaluate digital tools and emerging technologies. (Professional)

Group Role Play and viva

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 35 hours

Due: **Week 9**

Weighting: **35%**

Groupwork/Individual: Individual and Group

Short extension ³: No

AI Approach: Observed

You will submit a recorded group role-play video and individually answer viva questions to demonstrate your ability to apply fundamental pharmacology concepts to the drugs assigned to your group.

On successful completion you will be able to:

- Apply core pharmacological concepts related to pharmacokinetics and pharmacodynamics to explain drug behaviour and effects in the human body. (Scientist and Scholar)
- Explain the mechanism of action and adverse effects of commonly used therapeutic agents and discuss how drug interactions and individual variability impact drug safety in clinical practice. (Practitioner)
- Describe the key stages of drug discovery, development and regulatory processes, and identify the challenges affecting equitable access to traditional and complementary medicine. (Citizen)
- Communicate pharmacological concepts effectively in individual and team settings, using reflective practice to identify and address misconceptions and to evaluate digital tools and emerging technologies. (Professional)

End of session examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 45 hours

Due: **Exam Period**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will complete a formal exam that uses a combination of question types assessing content delivered across the session. You will complete this assessment under examination conditions during the University examination period.

On successful completion you will be able to:

- Apply core pharmacological concepts related to pharmacokinetics and pharmacodynamics to explain drug behaviour and effects in the human body. (Scientist and Scholar)
- Explain the mechanism of action and adverse effects of commonly used therapeutic agents and discuss how drug interactions and individual variability impact drug safety in clinical practice. (Practitioner)
- Describe the key stages of drug discovery, development and regulatory processes, and

identify the challenges affecting equitable access to traditional and complementary medicine. (Citizen)

- Communicate pharmacological concepts effectively in individual and team settings, using reflective practice to identify and address misconceptions and to evaluate digital tools and emerging technologies. (Professional)

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- [Academic Success](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

As a student enrolled in this unit, you will engage in a range of online and face-to-face learning activities. Details can be found on the iLearn site for this unit.

Recommended Readings

Unit readings are available via Leganto and the Macquarie University Waranara (Library) website.

The recommended textbook for this unit is:

- Ritter JM, Flower RJ, Henderson G, Loke YK, MacEwan D, Robinson E, et al. Rang & Dale's Pharmacology. 10th ed. 2022.

Technology Used

Active participation in the learning activities throughout the unit will require students to have access to a tablet, laptop or similar device. Students who do not own their own laptop computer may borrow one from the university library.

Unit Schedule

Proposed schedule. Note that due to unforeseen events, changes may happen.

	Topic	Learning activities
Week 1	MEDI2004 Introductory Lecture Introduction to Pharmacology (Pharmacokinetics and Pharmacodynamics)	Lecture (online modules) and tutorial
Week 2	Drug absorption and distribution	Seminar, Lectures (online modules) and tutorial
Week 3	Drug elimination: metabolism and excretion Drug elimination: pharmacokinetics parameters	Seminar, Lectures (online modules) and tutorial
Week 4	Introduction to Pharmacodynamics Quantification of drug effect	Seminar, Lectures (online modules) and tutorial
Week 5	Drug targets - Receptors, Enzymes and Transporters	Seminar, Lectures (online modules) and tutorial
Week 6	Ion Channels and diseases Drug safety: Poisoning, adverse effects and drug interaction	Seminar, Lectures (online modules) and tutorial
Week 7	Small molecules vs biological drugs Pharmacogenomics (Individual variation)	Seminar, Lectures (online modules) and tutorial
Week 8	Rational drug design, clinical trials and Placebo effect Drug regulation in Australia: TGA, drug schedule and PBS	Seminar, Lectures (online modules) and tutorial
Week 9	Native Plants and Traditional Aboriginal Medicines	Lectures (online modules) and tutorial
Week 10	Pharmacology of the Autonomic Nervous System Anti-inflammatory drugs - NSAIDs and corticosteroids	Seminar, Lectures (online modules) and tutorial
Week 11	 Antihypertensives & drugs for asthma and COPD	Seminar, Lectures (online modules) and tutorial
Week 12	Drugs for Dyslipidaemia & Diabetes	Seminar, Lecture (online modules) and tutorial
Week 13	Clinical Pharmacology	Lecture face-to-face (no tutorial)
Exam period		

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

The Reflective AI-Enhanced Learning Assignment was revised from two reflections to a single reflection, and its weighting was reduced to 15%. The remaining 5% was reallocated to the Group Role Play and Viva assessment.

Artificial Intelligence Tools

Macquarie University recognises that artificial intelligence (AI), especially generative AI, is rapidly reshaping education and the modern workplace. As AI becomes increasingly accessible, the University and your teaching staff are committed to preparing you to use these tools effectively, ethically, and with strong professional judgment. Rather than restricting technology, the emphasis is on helping you understand when and how AI can be used to enhance productivity, support learning, and reflect real-world professional practice. Across your degree, we will support you to develop the critical thinking, adaptability, and values-based decision-making skills required to navigate evolving AI tools responsibly, including acknowledging their use appropriately. You should always appropriately acknowledge when you have used AI tools within assessment tasks, including which AI tools you have used and how you have used them.

To provide clarity, Macquarie University uses a simple, two-tiered approach to AI in assessment:

- AI Open assessments allow you to fully incorporate AI, reflecting authentic tasks where AI would normally be used in professional settings.
- Observed with AI Optional assessments involve tasks where you either demonstrate essential knowledge without technology or show how you apply AI under supervision.

Across both categories, the goal is to ensure you build foundational knowledge, exercise sound judgment, and engage with AI in ways that uphold ethical, cultural, and university values.

Inclusion and Diversity

Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others based on their sex, gender, race, marital status, carers' responsibilities, disability, sexual orientation, age, political conviction or religious belief. All staff and students are expected to display appropriate behaviour that is conducive to a healthy learning environment for everyone.

Professionalism

In the Faculty of Medicine, Health and Human Sciences, professionalism is a key capability embedded in all our courses.

As part of developing professionalism, **students are expected to attend all small group interactive sessions**, including clinical, practical, laboratory, work-integrated learning (e.g., PACE placements), and team-based learning activities. Some learning activities are recorded (e.g., face-to-face lectures), however you are encouraged to avoid relying upon such material as they do not recreate the whole learning experience and technical issues can and do occur. As an adult learner, we respect your decision to choose how you engage with your learning, but we

would remind you that the learning opportunities we create for you have been done so to enable your success, and that by not engaging you may impact your ability to successfully complete this unit. We equally expect that you show respect for the academic staff who have worked hard to develop meaningful activities and prioritise your learning by communicating with them in advance if you are unable to attend a small group interactive session.

Another dimension of professionalism is having respect for your peers. It is the right of every student to learn in an environment that is free of disruption and distraction. Please arrive to all learning activities on time, and if you are unavoidably detained, please join activity as quietly as possible to minimise disruption. Phones and other electronic devices that produce noise and other distractions must be turned off prior to entering class. Where your own device (e.g., laptop) is being used for class-related activities, you are asked to close down all other applications to avoid distraction to you and others. Please treat your fellow students with the utmost respect. If you are uncomfortable participating in any specific activity, please let the relevant academic know.

Unit information based on version 2026.03 of the [Handbook](#)