



UNSW Course Outline

PHAR3101 Drug Discovery, Design and Development - 2024

Published on the 25 Aug 2024

General Course Information

Course Code : PHAR3101

Year : 2024

Term : Term 3

Teaching Period : T3

Is a multi-term course? : No

Faculty : Faculty of Medicine and Health

Academic Unit : School of Biomedical Sciences

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

This course will explore the process of drug discovery and development, from project and target identification to final drug registration. It will examine the principles and methodology behind project and target selection, hit discovery, high-throughput screening assays, as well as lead

identification and optimisation. Safety evaluation, clinical trials, and the essentials of intellectual property, regulatory affairs and commercialisation will also be discussed. Along the way, you will learn about some of the many different career options spanning all aspects of pharmacology, from jobs based in the laboratory, to computational and artificial intelligence roles, to clinical trial orientated roles, through to regulatory affairs and commercialisation. You will also learn some of the ways in which these professional roles intersect and collaborate to create a highly innovative, exciting, and safe drug discovery landscape.

Course Aims

- Gain an understanding of the processes involved in developing a new therapeutic
- Develop an appreciation of the complex and expensive nature of the drug discovery and development process
- Explore the different careers / roles available across the pharmaceutical industry and how they collaborate to build a highly innovative and safe pharmaceutical industry
- Develop skills in the interpretation and analysis of scientific data and literature, problem-solving, and the communication of information in an accessible manner.

Relationship to Other Courses

Assistance with progression checking:

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

- Progression plans for UNSW Medicine and Health programs can be found on the [UNSW Medicine & Health website](#).
- Progression plans for UNSW Science programs can be found on the [UNSW Science website](#).

Course Learning Outcomes

| Course Learning Outcomes |
|---|
| CLO1 : Explain the steps involved in drug development from bench to bedside. |
| CLO2 : Apply knowledge of the drug development process, including the challenges and opportunities of different approaches and drug modalities, to address novel scenarios. |
| CLO3 : Critically analyse relevant literature and experimental data and communicate the findings. |
| CLO4 : Describe the different professional roles and how they interact to enable innovation and safety within the pharmaceutical industry. |

| Course Learning Outcomes | Assessment Item |
|---|--|
| CLO1 : Explain the steps involved in drug development from bench to bedside. | <ul style="list-style-type: none"> • Quizzes • Final examination |
| CLO2 : Apply knowledge of the drug development process, including the challenges and opportunities of different approaches and drug modalities, to address novel scenarios. | <ul style="list-style-type: none"> • Technical Report • Quizzes • Final examination |
| CLO3 : Critically analyse relevant literature and experimental data and communicate the findings. | <ul style="list-style-type: none"> • Career opportunities within the drug development industry • Technical Report • Final examination |
| CLO4 : Describe the different professional roles and how they interact to enable innovation and safety within the pharmaceutical industry. | <ul style="list-style-type: none"> • Career opportunities within the drug development industry • Final examination |

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Echo 360

Learning and Teaching in this course

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

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

Additional Course Information

For all course related enquiries, please use the course e-mail address:
drugdiscovery@unsw.edu.au

Assessments

Assessment Structure

| Assessment Item | Weight | Relevant Dates |
|---|--------|---|
| Quizzes Assessment Format: Individual | 30% | Start Date: Not Applicable Due Date: In class in weeks 3, 5, 8, 10 |
| Technical Report Assessment Format: Individual Short Extension: Yes (2 days) | 20% | Due Date: 29/10/2024 05:00 PM |
| Career opportunities within the drug development industry Assessment Format: Group | 20% | Due Date: 08/11/2024 01:00 PM |
| Final examination Assessment Format: Individual | 30% | Due Date: During Final Exam period |

Assessment Details

Quizzes

Assessment Overview

30-minute quizzes will be held 4 times per term. The quizzes will be in the format of 2 short (10 mark) or 1 long (20 mark) answer question. The first two quizzes will be worth 6% each, with the remaining two quizzes worth 9% each.

The quiz question(s) will test your knowledge of the process of drug design and development, and your ability to apply the knowledge from lectures, workshops and practical classes to drug discovery and development scenarios. Results will be posted on Moodle when graded. Feedback will be provided in the form of written and/or in-class discussions.

Course Learning Outcomes

- CLO1 : Explain the steps involved in drug development from bench to bedside.
- CLO2 : Apply knowledge of the drug development process, including the challenges and opportunities of different approaches and drug modalities, to address novel scenarios.

Detailed Assessment Description

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

Assessment Length

30 minutes per quiz

Submission notes

Refer to Moodle for submission information.

Assessment information

Quizzes will be held in class using Inspera

Assignment submission Turnitin type

This is not a Turnitin assignment

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.

For more information on Generative AI and permitted use please see [here](#).

Technical Report

Assessment Overview

In your team, you will develop an assay protocol based on collated class data. Following an initial submission, each team will receive written feedback on their protocol and will have an opportunity to make changes prior to a final submission. You will also provide a peer evaluation score and feedback to assess each team members' individual contribution to the report and the final grades will be moderated based on these evaluations. This component of the task will be worth 5%.

Individually, you will produce a technical report discussing the data collected across practical classes using the protocol you have developed. This component of the task will be worth 15%.

Feedback will be provided via a marking rubric used to evaluate each report, along with additional written comments.

Course Learning Outcomes

- CLO2 : Apply knowledge of the drug development process, including the challenges and opportunities of different approaches and drug modalities, to address novel scenarios.
- CLO3 : Critically analyse relevant literature and experimental data and communicate the findings.

Detailed Assessment Description

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

Submission notes

Refer to Moodle for submission information

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Generative AI Permission Level

Assistance with Attribution

This assessment requires you to write/create a first iteration of your submission yourself. You are then permitted to use generative AI tools, software or services to improve your submission in the ways set out below.

Any output of generative AI tools, software or services that is used within your assessment must be attributed with full referencing.

If outputs of generative AI tools, software or services form part of your submission and are not appropriately attributed, your Convenor will determine whether the omission is significant. If so, you may be asked to explain your submission. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

For more information on Generative AI and permitted use please see [here](#).

Career opportunities within the drug development industry

Assessment Overview

In your team, you will select one career / role from the many options available across the pharmaceutical industry. After researching the career / role, you will create a profile for that role and then conduct and video a mock job interview addressing relevant selection criteria for the role. Feedback will be provided via a grading rubric and written feedback.

Course Learning Outcomes

- CLO3 : Critically analyse relevant literature and experimental data and communicate the findings.
- CLO4 : Describe the different professional roles and how they interact to enable innovation and safety within the pharmaceutical industry.

Detailed Assessment Description

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

Submission notes

Refer to Moodle for submission information.

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

Assistance with Attribution

This assessment requires you to write/create a first iteration of your submission yourself. You are then permitted to use generative AI tools, software or services to improve your submission in the ways set out below.

Any output of generative AI tools, software or services that is used within your assessment must be attributed with full referencing.

If outputs of generative AI tools, software or services form part of your submission and are not appropriately attributed, your Convenor will determine whether the omission is significant. If so, you may be asked to explain your submission. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

For more information on Generative AI and permitted use please see [here](#).

Final examination

Assessment Overview

This assessment will be in the format of short and long answer questions and will last for 2 hours. The questions will test your knowledge of the process of drug design and development, and your ability to apply the knowledge acquired from lectures, workshops and practical classes to drug discovery and development scenarios. Feedback is given in the form of the student's performance mark. If a student requires further feedback they may organise a meeting with the course convenor to review their answers to individual questions.

Course Learning Outcomes

- CLO1 : Explain the steps involved in drug development from bench to bedside.
- CLO2 : Apply knowledge of the drug development process, including the challenges and opportunities of different approaches and drug modalities, to address novel scenarios.
- CLO3 : Critically analyse relevant literature and experimental data and communicate the findings.
- CLO4 : Describe the different professional roles and how they interact to enable innovation and safety within the pharmaceutical industry.

Detailed Assessment Description

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

Assessment Length

2 hours

Submission notes

Refer to Moodle for submission information.

Assignment submission Turnitin type

This is not a Turnitin assignment

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.

For more information on Generative AI and permitted use please see [here](#).

General Assessment Information

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

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

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

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

Course Schedule

| Teaching Week/Module | Activity Type | Content |
|--------------------------------------|---------------|--|
| Week 1 : 9 September - 15 September | Lecture | The drug discovery process: Choosing the project |
| | Lecture | Novel target identification and validation |
| | Laboratory | Jobs and teamwork in the pharmaceutical industry |
| | Workshop | Choosing the project |
| Week 2 : 16 September - 22 September | Lecture | Target selection |
| | Lecture | Assay development |
| | Laboratory | Target selection |
| | Workshop | Target selection and validation |
| Week 3 : 23 September - 29 September | Lecture | High-throughput screening |
| | Lecture | Sources of active compounds |
| | Laboratory | Assay development 1 |
| | Workshop | Assay development and HTS screening |
| Week 4 : 30 September - 6 October | Lecture | Ligand-based drug design |
| | Lecture | Structure-based drug design |
| | Laboratory | Assay development 2 |
| | Workshop | Drug design |
| Week 5 : 7 October - 13 October | Lecture | Bioavailability |
| | Lecture | Biopharmaceuticals |
| | Laboratory | Assay development 3 |
| | Workshop | Bioavailability / Biopharmaceuticals |
| Week 7 : 21 October - 27 October | Lecture | Intellectual property |
| | Lecture | Pre-clinical toxicology: in vitro testing |
| | Laboratory | Careers in drug discovery |
| | Workshop | Intellectual property |
| Week 8 : 28 October - 3 November | Lecture | Pre-clinical toxicology: in vivo testing |
| | Lecture | Clinical trials |
| | Laboratory | Pre-clinical toxicology 1 |
| | Workshop | Pre-clinical toxicology |
| Week 9 : 4 November - 10 November | Lecture | Clinical trial design |
| | Lecture | Ethics of human and animal experimentation |
| | Laboratory | Preclinical toxicology 2 / Clinical trials 1 |
| | Workshop | Clinical trials & ethics |
| Week 10 : 11 November - 17 November | Lecture | Regulatory affairs |
| | Lecture | Commercialisation |
| | Laboratory | Clinical trials 2 |
| | Workshop | Regulatory affairs and commercialisation |

Attendance Requirements

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

General Schedule Information

The times and locations of classes can be found on [myUNSW](#) under Class Timetable.

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

Course Resources

Recommended Resources

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

Additional Costs

There are no additional costs associated with this course.

Course Evaluation and Development

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

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

Staff Details

| Position | Name | Email | Location | Phone | Availability | Equitable Learning Services Contact | Primary Contact |
|----------------------|---------------|-------|----------|-------|---|-------------------------------------|-----------------|
| Convenor | Matthew Perry | | WW 3E | | By appointment via the course e-mail address: drugdiscovery@unsw.edu.au | Yes | Yes |
| | Nicola Smith | | WW3E | | By appointment via the course e-mail address: drugdiscovery@unsw.edu.au | No | No |
| | Johnson Liu | | WW 3E | | By appointment via the course e-mail address: drugdiscovery@unsw.edu.au | No | No |
| Director of teaching | Angela Finch | | WW 3E | | By appointment via e-mail | No | No |
| Lecturer | Nicole Jones | | WW 3E | | By appointment via e-mail | No | No |
| | David Jacques | | | | By appointment via e-mail | No | No |
| | Lindsay Wu | | WW 3E | | By appointment via e-mail | No | No |

Other Useful Information

Academic Information

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

Student Code of Conduct

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

The [UNSW Student Code of Conduct](#) website provides a framework for the standard of conduct expected of UNSW students with respect to both academic integrity and your responsibility as a UNSW citizen.

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

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

Academic Honesty and Plagiarism

Academic integrity

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

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

In addition to the information you are required to review in your [ELISE training](#), UNSW Medicine &

Health strongly recommends that you complete the [Working with Academic Integrity](#) module before submitting your first assessment task.

Referencing

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

For further information on referencing support and styles, see the Current Student [Referencing page](#).

Academic misconduct and plagiarism

At UNSW, academic misconduct is managed in accordance with the [Student Misconduct Procedure](#). Allegations of plagiarism are generally handled according to the [UNSW Plagiarism Management Procedure](#). Plagiarism is defined in the [UNSW Plagiarism Policy](#) and is not tolerated at UNSW.

Use of Generative AI and other tools in your assessment

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

Your course convenor will outline if and how you can use Generative AI in each of your assessment tasks. Inappropriate use of generative AI is considered academic misconduct.

Options for the use of generative AI include: (1) no assistance (for invigilated assessments); (2) simple editing assistance; (3) drafting assistance; and (4) full assistance with attribution; and (5) Generative AI software-based assessments. See your individual assessment descriptions for the level of permitted use of generative AI for each task and see your course Moodle (or Open Learning) page for the full instructions on permitted use of generative AI in your assessment tasks for this course.

Instructions may include a requirement to submit the original generative AI responses, or drafts of your original work, or provide on request.

Submission of Assessment Tasks

Short extensions and special consideration

Short extension

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

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

Short extensions do not require supporting documentation. They must be submitted through [Special Consideration](#) before the assessment task deadline. No late applications will be accepted.

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

Special consideration

In cases where illness, misadventure or other circumstances beyond your control will prevent you from submitting your assessment by the due date and you require an extension, you need to formally apply for [Special Consideration](#) through myUNSW.

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

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

Examinations

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

page.

Timed online assessment tasks

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

Other assessment tasks

Late submission of assessment tasks

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

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

Failure to complete an assessment task

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

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

Feedback on assessments

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

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

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

Faculty-specific Information

Additional support for students

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

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

Mind Smart Guides are a series of mental health self-help resources designed to give you the psychological flexibility, resilience and self-management skills you need to thrive at university and at work.

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

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

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

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

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

Course evaluation and development

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

School-specific Information

Laboratory or practical class safety.

For courses where there is a laboratory or practical-based component, students are required to wear the specified personal protective equipment (e.g., laboratory coat, covered shoes, safety glasses) indicated in the associated student risk assessments. The student risk assessments will be provided on the course Moodle page and must be read and acknowledged prior to the class.

Master of Science in Health Data Science courses

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

School Contact Information

School guidelines on contacting staff:

Course questions

All questions related to course content should be posted on Moodle (or Open Learning) or as

directed by your Course Convenor.

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

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

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

Administrative questions

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

Complaints and appeals

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

If you have any grievances about your studies, we invite you to address these initially to the Course Convenor. If the response does not meet your expectations, you may then contact:

School Grievance Officer, Prof Nick Di Girolamo (n.digirolamo@unsw.edu.au)

Master of Science in Health Data Science programs: School Grievance Officer, Dr Sanja Lujic (s.lujic@unsw.edu.au)