UNSW Course Outline

HDAT9300 Computing for Health Data Science - 2024

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General Course Information

Course Code : HDAT9300
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : Faculty of Medicine and Health
Academic Unit : School of Biomedical Sciences
Delivery Mode : Multimodal
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate, Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Computing now pervades nearly every aspect of modern life, including health care delivery and health services management. The objective of this course is to develop 'computational thinking' in health data science students, by providing a thorough and principled introduction to computer

programming, algorithms, data structures and software engineering best practices. The ability to write clear, efficient and correct computer code is at the core of most data science practice and is a foundation skill set.

In this course, you will learn to program in the Python language through tackling health-related problems. Topics include data types, functions, data processing, simulation, software development and program testing and debugging. Theoretical principles are reinforced with extensive 'hands-on' coding in Python, including the NumPy and Pandas packages.

Core material will be delivered through short lectures and readings supported by interactive coding activities.

Course Aims

- Foster Computational Thinking: You will gain an understanding of computer programming, algorithms, data structures, and best practices in software engineering.
- Proficiency in Code Development: You will acquire the ability to produce clear, efficient, and error-free computer code, recognising that this is a fundamental skillset crucial for success in data science and related fields.

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 : Design algorithms to solve computation problems.
CLO2 : Implement algorithms using the Python programming language.
CLO3 : Conduct extensive testing and debugging of Python programs.
CLO4 : Appraise good (Pythonic) coding practice, including code documentation.

Course Learning Outcomes	Assessment Item
CLO1 : Design algorithms to solve computation problems.	• Solve exercises • Mid-term Assignment • Project
CLO2 : Implement algorithms using the Python programming language.	• Solve exercises • Mid-term Assignment • Project
CLO3 : Conduct extensive testing and debugging of Python programs.	• Solve exercises • Mid-term Assignment • Project
CLO4 : Appraise good (Pythonic) coding practice, including code documentation.	• Solve exercises • Mid-term Assignment • Project

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Open Learning, Jupyter Notebook, Spyder

Learning and Teaching in this course

All course materials and course announcements are provided on the course learning management system.

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.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Solve exercises Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Week 3, Week 5 and Week 9
Mid-term Assignment Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: See LMS for date and time (Week 7)
Project Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: See the course LMS for date and time (Week 11)

Assessment Details

Solve exercises

Assessment Overview

This assessment is comprised of 3-4 periodic mini-assessments where you will demonstrate your coding ability based on the course content covered up to that point. Each mini-assessment set will comprise several independent tasks, employing various evaluation methods to promote a comprehensive understanding of the material. You will receive feedback in the form of a mark and individual comments within 10 working days of submission.

Course Learning Outcomes

- CLO1 : Design algorithms to solve computation problems.
- CLO2 : Implement algorithms using the Python programming language.
- CLO3 : Conduct extensive testing and debugging of Python programs.
- CLO4 : Appraise good (Pythonic) coding practice, including code documentation.

Detailed Assessment Description

Detailed instructions regarding this assessment will be provided on the course learning management system (LMS).

Assessment Length

Refer to the course LMS for instructions

Submission notes

A short extension of 2 days is available for this task.

Assessment information

SIMPLE EDITING ASSISTANCE

For this assessment task, you may use AI-based software for standard editing, specifically limited to spelling and natural language grammar checking. You must not use any functions that generate or paraphrase or translate or complete passages of text or code, whether based on your own work or not.

Please note that your submission may undergo scrutiny through an AI-generated text detection tool. If your marker has concerns that your answer contains passages of AI-generated text, you may be asked to explain your work. 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.

Refer to the course LMS for information on assignment dates and times.

Assignment submission Turnitin type

This is not a Turnitin assignment

Mid-term Assignment

Assessment Overview

You will be required to demonstrate your coding ability in relation to the course content covered by the midway point of the course. This assignment gives you the opportunity to practise what you have learnt on a relatively large problem (compared to the Solve exercises). Feedback is provided by means of a mark and individual comments, within 10 working days of submission.

Course Learning Outcomes

- CLO1 : Design algorithms to solve computation problems.
- CLO2 : Implement algorithms using the Python programming language.
- CLO3 : Conduct extensive testing and debugging of Python programs.
- CLO4 : Appraise good (Pythonic) coding practice, including code documentation.

Detailed Assessment Description

Detailed instructions regarding this assessment will be provided on the course learning management system (LMS).

Assessment Length

Refer to the course LMS for instructions

Submission notes

A short extension of 2 days is available for this task.

Assessment information

SIMPLE EDITING ASSISTANCE

For this assessment task, you may use AI-based software for standard editing, specifically limited to spelling and natural language grammar checking. You must not use any functions that generate or paraphrase or translate or complete passages of text or code, whether based on your own work or not.

Please note that your submission may undergo scrutiny through an AI-generated text detection tool. If your marker has concerns that your answer contains passages of AI-generated text, you may be asked to explain your work. 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.

Assignment submission Turnitin type

This is not a Turnitin assignment

Project

Assessment Overview

In the final project, you will be given a larger-scale problem, with less directed tasks, to demonstrate your knowledge of all stages of the programming process. Specifically, you will be required to: understand the problem requirements; design a solution; refine the design; implement and document the design and test extensively to validate that the program meets the requirements. You will be provided with individual feedback on your submission, marked against a rubric.

Course Learning Outcomes

- CLO1 : Design algorithms to solve computation problems.
- CLO2 : Implement algorithms using the Python programming language.
- CLO3 : Conduct extensive testing and debugging of Python programs.
- CLO4 : Appraise good (Pythonic) coding practice, including code documentation.

Detailed Assessment Description

Detailed information about this assessment will be provided on the course learning management system (LMS).

Assessment Length

Refer to the course LMS for instructions

Submission notes

A short extension of 2 days is available for this task.

Assessment information

SIMPLE EDITING ASSISTANCE

For this assessment task, you may use AI-based software to research libraries prior to completing your assessment. You are also permitted to use standard editing functions, specifically limited to spelling and natural language grammar checking. You must not use any functions that generate or paraphrase or translate or complete passages of text or code, whether based on your own work or not.

Please note that your submission may undergo scrutiny through an AI-generated text detection tool. If your marker has concerns that your answer contains passages of AI-generated text, you may be asked to explain your work. 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.

Assignment submission Turnitin type

This is not a Turnitin assignment

General Assessment Information

Detailed instructions regarding assessments for this course are provided on the course learning management system.

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 the course learning management system.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Workshop	Introduction to Programming and Fundamental Concepts
Week 2 : 19 February - 25 February	Workshop	Essential Programming Principles and Techniques
Week 3 : 26 February - 3 March	Workshop	Logical Flow and Conditional Logic
Week 4 : 4 March - 10 March	Workshop	Iterative Programming Approaches
Week 5 : 11 March - 17 March	Workshop	Functions, Scope, and Scripting
Week 6 : 18 March - 24 March	Other	Flex week
Week 7 : 25 March - 31 March	Workshop	Algorithmic Thinking and Data Structures
Week 8 : 1 April - 7 April	Workshop	Agile Development and Testing Strategies
Week 9 : 8 April - 14 April	Workshop	Debugging and File Handling
Week 10 : 15 April - 21 April	Workshop	Data Analysis Using Python Libraries

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 learning management system.

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 on the course learning management system at the end of term.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Marzia Hoque		AGSM Level 2		By appointment, email to schedule	No	Yes

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 Plagarism

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 your assessment tasks. Options for the use of generative AI include: (1) no assistance; (2) simple editing assistance; (3) planning assistance; and (4) full assistance with attribution.

You may be required to submit the original generative AI responses, or drafts of your original work. Inappropriate use of generative AI is considered academic misconduct.

See your course Moodle (or Open Learning) page for the full instructions for individual assessment tasks for your course.

Submission of Assessment Tasks

Short extensions and special consideration

Short extension

Commencing in Term 1, 2024, UNSW has introduced 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 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 short term events beyond your control affect your performance in a specific assessment task you may formally apply for Special Consideration through myUNSW.

UNSW has a **Fit to Sit rule**, which means that by sitting an examination on the scheduled 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 the School Grievance Officer, Prof Nick Di Girolamo (n.digirolamo@unsw.edu.au).

For MSc. HDS students: School Grievance Officer, Dr Sanja Lujic (s.lujic@unsw.edu.au), Centre for Big Data Research in Health