



UNSW Course Outline

COMP9020 Foundations of Computer Science - 2024

Published on the 30 May 2024

General Course Information

Course Code : COMP9020

Year : 2024

Term : Term 2

Teaching Period : T2

Is a multi-term course? : No

Faculty : Faculty of Engineering

Academic Unit : School of Computer Science and Engineering

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Postgraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

The official scope is: mathematical methods for designing correct and efficient programs; mathematics for algorithm analysis; logic for proving and verification.

The actual content is taken from a list of subjects that constitute the basis of the tool box of every serious practitioner of computing: set and relation theory; induction, recursion and recurrence relations; order of growth of functions; structured counting (combinatorics); discrete probability; graph theory and trees for algorithmic applications; propositional logic and boolean algebras.

Course Aims

This course is typically taken early in the Masters program and provides a foundation for the formal reasoning that is required in subsequent courses.

After successfully completing this course, you will have developed an increased level of mathematical maturity to assist with the fundamental problem of *finding, formulating, and proving properties* of programs.

Course Learning Outcomes

Course Learning Outcomes
CL01 : Understand the foundational structures used in discrete mathematics
CL02 : Understand the fundamental Computer Science concepts of recursion and induction
CL03 : Understand Boolean and propositional logic
CL04 : Understand simple combinatorics, probability and statistics
CL05 : Analyze the correctness and efficiency of algorithms
CL06 : Apply mathematical tools to formulate and prove problems in Computer Science

Course Learning Outcomes	Assessment Item
CL01 : Understand the foundational structures used in discrete mathematics	• Final exam
CL02 : Understand the fundamental Computer Science concepts of recursion and induction	• Final exam
CL03 : Understand Boolean and propositional logic	• Final exam
CL04 : Understand simple combinatorics, probability and statistics	• Final exam
CL05 : Analyze the correctness and efficiency of algorithms	• Final exam
CL06 : Apply mathematical tools to formulate and prove problems in Computer Science	• Final exam

Learning and Teaching Technologies

Moodle - Learning Management System | WebCMS3

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Final exam Assessment Format: Individual	60%	Due Date: TBA - Exam Period

Assessment Details

Final exam

Assessment Overview

The final exam, held in the UNSW exam period, will contain questions that students should be able to answer in 2 hours if they know the material well. The final exam will be manually marked. In order to pass the course, students must achieve a minimum of 40% in this component.

Course Learning Outcomes

- CL01 : Understand the foundational structures used in discrete mathematics
- CL02 : Understand the fundamental Computer Science concepts of recursion and induction
- CL03 : Understand Boolean and propositional logic
- CL04 : Understand simple combinatorics, probability and statistics
- CL05 : Analyze the correctness and efficiency of algorithms
- CL06 : Apply mathematical tools to formulate and prove problems in Computer Science

General Assessment Information

Please refer to WebCMS for the correct Assessment Name and Weighting

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	L1 - Introduction - Variables, Sets, Relations, Functions, and Graphs. L2 - Logic (Propositional)
Week 2 : 3 June - 9 June	Lecture	L1 - Logic (Propositional and Predicate) L2 - Logic (Predicate - continued)
Week 3 : 10 June - 16 June	Lecture	L1 - Number Theory L2 - Number Theory (continued)
Week 4 : 17 June - 23 June	Lecture	L1 - Mathematical Induction L2 - Recursion
Week 5 : 24 June - 30 June	Lecture	L1 - Set Theory L2 - Set Theory (continued)
Week 6 : 1 July - 7 July	Other	FLEX WEEK
Week 7 : 8 July - 14 July	Lecture	L1 - Functions and their Properties L2 - Functions and their Properties (continued)
Week 8 : 15 July - 21 July	Lecture	L1 - Relations and their Properties L2 - Relations and their Properties (continued)
Week 9 : 22 July - 28 July	Lecture	L1 - Probabilities L2 - Probabilities (continued)
Week 10 : 29 July - 4 August	Lecture	L1 - Graphs and Trees L2 - Graphs and Trees (continued)

Attendance Requirements

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

Course Resources

Prescribed Resources

Please make sure you have a copy of the following textbook:

Epp., Susanna S. (2020): Discrete Mathematics with Applications (Metric Version - Fifth Edition), Cengage Publishing.

Recommended Resources

Epp., Susanna S. (2020): Discrete Mathematics with Applications (Metric Version - Fifth Edition), Cengage Publishing.

Course Evaluation and Development

This course is evaluated each session using the MyExperience system.

Everyone's feedback throughout and at the end of the term is very valuable.

Remember - we need you! Thanks for reading all of this - see you in the lectures :)

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Sebastian Sequoi ah-Grayson					Yes	Yes

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's [Special Consideration page](#).

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and policies. In particular, students should be familiar with the following:

- [Attendance](#)
- [UNSW Email Address](#)
- [Special Consideration](#)
- [Exams](#)
- [Approved Calculators](#)
- [Academic Honesty and Plagiarism](#)
- [Equitable Learning Services](#)

III. Equity and diversity

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 convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. 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.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: <https://www.unsw.edu.au/engineering/student-life/student-resources/program-design>.

Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.

Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You 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 tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

[Engineering Student Support Services](#) – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

School Contact Information

CSE Help! - on the Ground Floor of K17

- For assistance with coursework assessments.

The Nucleus Student Hub - <https://nucleus.unsw.edu.au/en/contact-us>

- Course enrolment queries.

Grievance Officer - grievance-officer@cse.unsw.edu.au

- If the course convenor gives an inadequate response to a query or when the courses convenor does not respond to a query about assessment.

Student Reps - stureps@cse.unsw.edu.au

- If some aspect of a course needs urgent improvement. (e.g. Nobody responding to forum queries, cannot understand the lecturer)

You should **never** contact any of the following people directly:

- Vice Chancellor

- Pro-vice Chancellor Education (PVCE)

- Head of School

- CSE administrative staff

- CSE teaching support staff

They will simply bounce the email to one of the above, thereby creating an unnecessary level of indirection and a delay in the response.