Course Outline

Course Details

Course Code	COMP2111
Course Title	System Modelling and Design
Units of Credit	6
Course Website	https://www.cse.unsw.edu.au/~cs2111

Staff

Name	Role
Dr. Christine Rizkallah	Lecturer in Charge
Dr. Paul Hunter	Lecturer
Prof. Carroll Morgan	Guest Lecturer
Vivian Dang	Tutor
Matt di Meglio	Tutor
Dr. Liam O'Connor	Course Admin

Course Summary

The course builds on the MATH1081 Discrete Mathematics course, examining the role of Mathematics in Computer Science. The main focus will be on introducing students to formal modelling and specification and how they are used in Software Development.

The twin aims are to improve logical literacy skills, and provide students with a solid grounding in mathematical models of computation.

Course Timetable

Lectures

Day	Time	Location
Monday	16:00-18:00	Central Lecture Block 5
Tuesday	13:00-15:00	Old Main Building 230

Tutorials

Day	Time	Location
Tuesday	15:00-16:00	UNSW Business School 107
Tuesday	16:00-17:00	Quadrangle G054
Wednesday	14:00-15:00	Webster 252

Outcomes

At the conclusion of this course, you should be able to:

- Formally specify software systems using propositional and predicate logic, as well as program logics.
- Formally model computation and software systems using automata, semantics, and other logical models.
- Apply proof techniques to computation and software systems.
- Understand mathematical structures and techniques common to other theoretical aspects of computer science.

Graduate Capabilities

According to UNSW policy, graduate attributes are important *because the disciplinary knowledge that students develop at university is not adequate in itself as the basis for their future lives. Instead, graduates need qualities and skills that equip them for lifelong learning. These include critical thinking and problem-solving skills as well as communication skills and information literacy skills.*

This course contributes to the development of the following graduate capabilities:

Graduate Capability	Acquired in
scholarship: understanding of their discipline in its interdisciplinary context	lectures
scholarship: capable of independent and collaborative enquiry	tutorials, assignments
scholarship: rigorous in their analysis, critique, and reflection	tutorials, assignments
scholarship: able to apply their knowledge and skills to solving problems	assignments
scholarship: capable of effective communication	forum
scholarship: information literate	lectures, tutorials, assignments
scholarship: digitally literate	lectures
professionalism: capable of independent, self-directed practice	assignments
professionalism: capable of operating within an agreed Code of Practice	all course-work, by doing it yourself
global citizens: culturally aware and capable of respecting diversity and acting in socially just/responsible ways	interaction with your fellow students

Assumed Knowledge

Proofs, set theory, propositional logic, predicate logic (all from from MATH1081); general mathematical concepts from MATH1131/MATH1231; programming concepts from COMP1511/COMP2521 courses (or the higher versions of these courses where available); requirements concepts from COMP1531.

Teaching Strategies

Lectures will include exercises where we examine the practice of formulating and proving mathematical properties of relevance to Computer Science. Weekly tutorials aim to cement understanding and provide immediate and ongoing feedback for students to assess their understanding of the course material. Assignments aim to deepen analysis and understanding via additional examples and problems. There are no laboratory classes for this subject.

Assignments are tentatively due at the end of weeks 4, 7, and 10. Late submissions will be penalized at a rate of 10% per 12 hour period or part thereof.

Assessment

The final mark for this course is made of the following components:

- Assignments 1, 2 and 3, worth 10 marks each.
- Weekly online quizzes, worth 16 marks in total.
- 4 participation marks, based on contributions in tutorials and completion of class surveys.
- a final written exam (2 hours) worth 50 marks

Final Examination

The final exam is a two hour written exam. Requests for a supplementary exam will only be considered where students (a) have completed all other course components to a satisfactory standard, (b) have been absent from the final exam, (c) and have submitted a fully documented request for special consideration to student lifecycle within three working days of the final exam.

Student Conduct

The **Student Code of Conduct** (Information, Policy) sets out what the University expects from students as members of the UNSW community. As well as the learning, teaching and research environment, the University aims to provide an environment that enables students to achieve their full potential and to provide an experience consistent with the University's values and guiding principles. A condition of enrolment is that students **inform themselves** of the University's rules and policies affecting them, and conduct themselves accordingly.

In particular, students have the responsibility to observe standards of equity and respect in dealing with every member of the University community. This applies to all activities on UNSW premises and all external activities related to study and research. This includes behaviour in person as well as behaviour on social media, for example Facebook groups set up for the purpose of discussing UNSW courses or course work. Behaviour that is considered in breach of the Student Code Policy as discriminatory, sexually inappropriate, bullying, harassing, invading another's privacy or causing any person to fear for their personal safety is serious misconduct and can lead to severe penalties, including suspension or exclusion from UNSW.

If you have any concerns, you may raise them with your lecturer, or approach the School Ethics Officer, Grievance Officer, or one of the student representatives.

Plagiarism is defined as using the words or ideas of others and presenting them as your own. UNSW and CSE treat plagiarism as academic misconduct, which means that it carries penalties as severe as being excluded from further study at UNSW. There are several on-line sources to help you understand what plagiarism is and how it is dealt with at UNSW:

- Plagiarism and Academic Integrity
- UNSW Plagiarism Procedure

Make sure that you read and understand these. Ignorance is not accepted as an excuse for plagiarism. In particular, you are also responsible that your assignment files are not accessible by anyone but you by setting the correct permissions in your CSE directory and code repository, if using. Note also that plagiarism includes paying or asking another person to do a piece of work for you and then submitting it as your own work.

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 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.

If you haven't done so yet, please take the time to read the full text of

- UNSW's policy regarding academic honesty and plagiarism

The pages below describe the policies and procedures in more detail:

- Student Code Policy
- Student Misconduct Procedure
- Plagiarism Policy Statement
- Plagiarism Procedure

You should also read the following page which describes your rights and responsibilities in the CSE context:

- Essential Advice for CSE Students

Course Schedule

Available on its own dedicated page (see the sidebar).

Resources for Students

There is no set textbook, however the following resources provide useful background reading:

- Eric Lehman, F. Thomson Leighton, and Albert R. Meyer, Discrete Mathematics for Computer Science. 1042 pages, online textbook, January 2018 edition.
- Carroll Morgan, Programming from Specifications , Prentice-Hall, 1998.
- John C. Reynolds , The Craft of Programming , Prentice-Hall, 1981.

Getting Help

Questions regarding the course material, assignments, exercises, and general administrative questions should be asked on the course forum (accessible from the course web page), where answers benefit the whole class. Alternatively, approach the lecturer after class. To discuss matters concerning your personal performance, please send an email to the course account `cs2111@cse.unsw.edu.au`. For identification purposes, if you wish to send email concerning the course, you must send the mail from your CSE or UNSW student account (not from GMail, Yahoo, Bigpond or similar), and include your student id and your full name.

Course Evaluation and Development

This course is being continuously improved and we will conduct a survey at the end of session to obtain feedback on the quality of the various course components. Your participation in the survey will be greatly appreciated.

Student feedback over the last years has generally been positive.