Course Outline Public

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Course Details

Course Code	COMP9020
Course Title	Foundations of Computer Science
Units of Credit	6
Course Website	http://www.cse.unsw.edu.au/~cs9020 (http://www.cse.unsw.edu.au/~cs9020)
Handbook Entry	http://www.handbook.unsw.edu.au/postgraduate/courses/current/COMP9020.html (http://www.handbook.unsw.edu.au/postgraduate/courses/current/COMP9020.html)

Course Summary

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, function and relation theory; propositional logic and boolean algebras; graph theory and trees for algorithmic applications; induction, recursion and recurrence relations; order of growth of functions; structured counting (combinatorics); discrete probability.

Assumed Knowledge

None

Course Timetable

The course timetable is available here. (/COMP9020/19T1/timetable)

Course Aims and Student Learning Outcomes

After successfully completing this course, students will have developed an increased level of mathematical maturity to assist with the fundamental problem of

1. finding and formulating properties of programs, especially their correctness w.r.t. given requirements and specifications
2. analysing and proving properties of programs, in particular their correctness and runtime behaviour

Online quizzes, mid-term test and final exam will ensure that students have acquired this level of mathematical maturity.

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

Graduate Capability	Acquired in
Scholars capable of independent and collaborative enquiry, rigorous in their analysis, critique and reflection, and able to innovate by applying their knowledge and skills to the solution of novel as well as routine problems	lectures, in-class exercises, problem sets, quizzes
Professionals capable of ethical, self-directed practice and independent lifelong learning	problem sets, quizzes
Global citizens who are culturally adept and capable of respecting diversity and acting in a socially just and responsible way	interaction with your lecturer and fellow students

Teaching Strategies

- **Lectures** introduce concepts and show examples
- **Problem sets** reinforce concepts, provide additional examples and allow students to solve problems
- **Quizzes** allow students to demonstrate their problem-solving skills

Teaching Rationale

Lectures will include exercises where we examine the practice of formulating and proving mathematical properties of relevance to Computer Science. Problem sets and quizzes aim to deepen analysis and understanding via additional examples and problems.

Assessment

Component	Maximum Mark
Quizzes (weeks 2, 3, 4, 5, 7, 8, 9)	20
Mid-term online test (week 6)	20
Final Exam (exam period)	60

Each of the 7 quizzes is worth 3 marks (7 * 3 = 21). The overall quiz mark will be capped at 20, meaning you can lose 1 mark and still achieve the maximum.

Your overall score in the course will be the **maximum** of:

- quiz mark + mid-term + final
- mid-term + 80*(final/60)
- quiz mark + 80*(final/60)
- 100*(final/60)

In other words: *if you do better in the final exam, then the quizzes and/or your mid-term result will be ignored.*

To pass the course, your overall score must be 50 or higher **and** your mark for the final exam must be 25 or higher. If you meet both conditions, your overall score will be your mark for this course.

Only students who do not meet these requirements *but achieve an overall score ≥47* will be offered a "compassion" supplementary exam, in which they have to achieve a mark ≥50 to pass with a final mark of 50.

Course Schedule

Numbers, Sets, Formal Languages	week 1
Logic, Proofs, Boolean Algebra	week 2
Functions and Relations	week 3
Equivalence and Order Relations	week 4
Graphs and Trees	week 5
Mid-term online test	**week 6** (Wednesday)
Induction, Recursion, Big-Oh Notation	week 7
Counting and Probability	week 8
Conditional Probability, Expectation	week 9

Student Conduct

The **Student Code of Conduct** (Information (https://student.unsw.edu.au/conduct) , Policy (https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf)) 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 one'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 (mailto:ethics-officer@cse.unsw.edu.au) , Grievance Officer (mailto:grievance-officer@cse.unsw.edu.au) , or one of the student representatives.

Academic Honesty and Plagiarism

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 (https://student.unsw.edu.au/plagiarism)

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

- Student Code of Conduct Policy (https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf)
- Plagiarism Policy Statement (https://www.gs.unsw.edu.au/policy/documents/plagiarismpolicy.pdf)
- Plagiarism Procedure (https://www.gs.unsw.edu.au/policy/documents/plagiarismprocedure.pdf)
- Student Misconduct Procedure (https://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)

Resources for Students

The primary textbook associated with this course is

- [RW] KA Ross and CR Wright, *Discrete Mathematics,* (https://booko.com.au//9780130652478/Discrete-Mathematics) 5th edition, Pearson, 2003.

This has been the recommended textbook for the course for the last 10 or more years. The following comprehensive lecture notes, which are from a similar course at MIT, provide supplementary material:

- [LLM] E Lehman, FT Leighton and A Meyer, *Mathematics for Computer Science,* (http://people.csail.mit.edu/meyer/mcs.pdf) Creative Commons 2015.

Course Evaluation and Development

This course is being continuously improved and we will conduct a survey through UNSW's myExperience process 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. Students are also encouraged to provide informal feedback during the session, and to notify the lecturer-in-charge of any problems as soon as they arise.

Student feedback from last offerings indicated that students were very satisfied with the course, but expressed an interest in a weekly tutorial help session, which we will offer this year.

Resource created about a year ago (Monday 04 February 2019, 03:51:40 PM), last modified about a year ago (Monday 04 February 2019, 04:27:04 PM).

Comments

(/COMP9020/19T1/forums/search?forum_choice=resource/22698)

(/COMP9020/19T1/forums/resource/22698)



Peng Wang (/users/z5227348) 11 months ago (Sat May 11 2019 11:20:14 GMT+1000 (Australian Eastern Standard Time))

HI Michael..if we fail the exam .do we have a chance to do the sup-exam

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Michael Thielscher (/users/z3343107) 11 months ago (Mon May 13 2019 09:55:52 GMT+1000 (Australian Eastern Standard Time))

The assessment criteria from the course outline will be strictly adhered to. See also slide 9 (week 10) (https://www.cse.unsw.edu.au/~cs9020/19T1/slides/week10.pdf) :

- To pass the course, your overall Score must be 50 or higher **and** your mark for the final exam must be 25 or higher.
- The final exam is your only chance to pass.
- “Compassion Supp” **only** available to students who do not meet the requirements to pass the course but achieve an overall Score ≥47. Must score ≥50 in the supp to pass with an overall mark of 50.

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Zijian Zhang (/users/z5171560) 11 months ago (Fri May 03 2019 16:51:02 GMT+1000 (Australian Eastern Standard Time))

where can i find the all answer to the text book. The answer in textbook is not complete.

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Michael Thielscher (/users/z3343107) 11 months ago (Sat May 04 2019 11:38:27 GMT+1000 (Australian Eastern Standard Time))

This has a purpose: you should reach a maturity level that enables you to evaluate your own performance (self-assessment).

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Hugh Deacon (/users/z3389639) 12 months ago (Fri Apr 19 2019 14:42:58 GMT+1000 (Australian Eastern Standard Time))

Hi Michael,

Will the exam contain questions for which it would really be best to use a calculator to save time, e.g. large multiplication/division etc? I note there are strict calculator requirements, so I'd need to get a new one if we are expecting to need to use one in the exam.

Cheers,

Hugh

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Jordan Krucler (/users/z5232392) 12 months ago (Sat Apr 20 2019 09:08:34 GMT+1000 (Australian Eastern Standard Time))

Hi Hugh,

Where did you find the calculator restrictions? I haven't read these yet.

Regards,

Jordan

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Michael Thielscher (/users/z3343107) 12 months ago (Sat Apr 20 2019 10:09:28 GMT+1000 (Australian Eastern Standard Time))

In COMP9020 calculators are neither permitted nor needed for the exam since *complicated* multiplications or divisions will not occur.

PS. Other courses that do permit calculators usually confine these to UNSW approved models.

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Jordan Krucler (/users/z5232392) 12 months ago (Sat Apr 20 2019 21:07:42 GMT+1000 (Australian Eastern Standard Time))

In the exam timetable it states that "Notes as specified by school" are allowed. Are there any restrictions to the notes we are allowed to bring, where are these restrictions described?

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Michael Thielscher (/users/z3343107) 12 months ago (Sun Apr 21 2019 11:46:40 GMT+1000 (Australian Eastern Standard Time))

The exam is closed book but you will be allowed to bring *one* A4-sized sheet (double-sided is ok) of your *own handwritten* notes. For more exam instructions see Exam -> Final exam: Instructions.

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Yaoxuan Wang (/users/z5189827) 11 months ago (Tue Apr 23 2019 20:41:33 GMT+1000 (Australian Eastern Standard Time))

one A4-sized sheet of our own handwritten notes will be perfect! Many thanks!

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Hugh Deacon (/users/z3389639) 12 months ago (Sat Apr 20 2019 12:35:06 GMT+1000 (Australian Eastern Standard Time))

Great, thanks Michael.

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Promod Sinha (/users/z5232087) about a year ago (Mon Mar 25 2019 09:09:15 GMT+1100 (Australian Eastern Daylight Time))

Hi Michael,

Will we have study break between last class (week 9) and final examination?

Thank you,

Promod

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Michael Thielscher (/users/z3343107) about a year ago (Mon Mar 25 2019 13:42:29 GMT+1100 (Australian Eastern Daylight Time))

See the UNSW academic calendar for information about the teaching, study and examination periods.

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Ujjwal Garg (/users/z5212244) about a year ago (Tue Mar 19 2019 16:47:57 GMT+1100 (Australian Eastern Daylight Time))

Hi sir,

I wanted to inquire about the timings and venue of the Mid Term that is scheduled on Wednesday of week 6 (27th March).

I also wanted to point out that i have a COMP 9331 Mid Term as well that day at 12 PM.

Looking forward for a reply.

Thank you

Ujjwal

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Michael Thielscher (/users/z3343107) about a year ago (Wed Mar 20 2019 10:38:44 GMT+1100 (Australian Eastern Daylight Time))

See slide 2 week 5 (https://www.cse.unsw.edu.au/~cs9020/19T1/slides/week5.pdf)

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