

COMP2022 Models of Computation

Administration

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August 1, 2024



THE UNIVERSITY OF
SYDNEY



Welcome to COMP2022!

This unit provides an introduction to the foundations of computing. The main aims are to introduce and compare different models of computation based on state-machines, grammars, and logic.

After this unit, you will have a better idea of what computation is.

For instance, you will be able to convincingly answer this question:
Can every computational problem be solved by some program?

Topics

1. Regular Expressions, Finite Automata
2. Context-free grammars
3. Turing Machines, Computational Complexity
4. Propositional Logic, Predicate Logic

These topics appear in other courses:

- DATA2001:Data Science
- COMP2123:Data Structures and Algorithms
- COMP3027:Algorithm Design
- SOFT3202:Software Construction and Design 2
- COMP4270:Randomised and Advanced Algorithms
- COMP3308:Introduction to Artificial Intelligence
- CSEC5619:Applied Cryptography
- COMP5046:Natural Language Processing
- PHIL3610:Logic and Computation
- MATH3066:Algebra and Logic

Teaching team

Lecturer and co-ordinator: Sasha Rubin

Lecturer: Sri AravindaKrishnan Thyagarajan (Aravind)

TA: Linus Cooper

[Read the welcome post on Ed!](#)

Here are some highlights...

Overview

Lectures:

- Week 1: 1pm-3pm in J09.309
- Weeks 2-13: 2pm-4pm in F19.315

Systems:

- Ed: Announcements, discussion, lecture slides, tutorials and assignments (including solutions)
- Gradescope: Assignments, Quizzes, Grades
- Canvas: lecture recordings
- Email: only for private issues

Assessments

Quizzes (worth 12%, Gradescope):

- 12 equal-weight quizzes (in addition to Quiz 00 which does not count for grades)
- 7 calendar days to complete each
- untimed, multiple submissions allowed before due date

Assignments (worth 28%, Gradescope):

- 4 equal-weight assignments
- 14 calendar days to complete each

Final exam (worth 60%, in person):

- 40% barrier
- One A4 double-sided cheatsheet allowed

Late policy for assignments

- There is an **automatic** 5-day simple extension (do not apply via email or via the simple extension portal)
- The late penalty is non-standard: 5 days after the due date, the penalty is 5% of the available marks per day for the first **two days**, and after that you will be given a mark of 0.
- Approved SC will result in mark adjustment, not an extension of time.

Late submission examples

If you have not been granted special consideration, and if your work would have scored 65%:

- If you submit 4 days and 23 hours late you get 65% (i.e., no penalty),
- If you submit 5 days and 1 hour late you get 60%,
- If you submit 6 days and 1 hour late you get 55%,
- If you submit 7 days or more late you get 0% (Gradescope will close for submissions 7 days after the due date)

The submission site may be slow near deadlines.

Academic Integrity

Read the University Policy.

1. Submit your own work, do your own assessments
2. Do not confuse legitimate co-operation and cheating!
You can discuss the assignment at a high-level with other students in the unit, this is legitimate collaboration, but you cannot complete the assignment together — everyone must write their own code or report (otherwise all students involved are penalised).
3. Do not seek external help on assignments or post the assignment questions online, e.g., no StackExchange, Chegg, ChatGPT, Bard, Grammarly, private tutors.
4. you should submit typed pdfs that can be read by turnitin, or you will get zero for that answer.

Assumed knowledge

This course assumes that you know basic **discrete mathematics**, including basic mathematical notation, basic set theory, and basic mathematical arguments

You will struggle without such a background

Tutorial 1 is a good summary of the required discrete mathematics

It is your responsibility to make sure you are very comfortable with the assumed knowledge.

Student life, well being, and support

The university has a wide range of support and services.

www.sydney.edu.au/students/support.html

Feedback

We are asking for a student to volunteer to be a class representative.

This person will meet with me a few times during the semester to discuss any feedback that you give them privately or anonymously.

To volunteer, please make a brief private post on Ed saying why you want to volunteer.

About us

Sasha

- Taught this course since 2020.
- Voted the SCS Best Lecturer in 2023.
- Field of research is Computational Logic and Automata Theory, with applications to AI.

Aravind

- Joined USyd in June 2024.
- Field of research is cryptographic security aspects of decentralized systems like Blockchains, and Cryptocurrencies.

If you like the topics in this UoS, and do very well in this unit, come talk to us about research projects!

What can you expect of us?

- "Very formal, very specific teaching that made learning much simpler to avoid confusion or any other issue."
- "The examples and history of where these models are applied in relation to computer science makes it more interesting to learn about them."
- "The lecturer takes time and patience to wait and answer student questions with different approaches in explaining complex concepts."
- "The lecturer explains new concepts clearly without rushing forward or taking too much time."
- "This course is very clear about what it expects which I appreciate. There were clear distinctions between what you are expected to get from the lectures and what you are meant to synthesize on your own."

Tips on doing well from current/previous tutors

1. Attend all lectures and tutorials
2. Attempt all the tutorial questions before the tutorial
3. Complete all tutorial questions after the tutorial
4. If you are confused in the first few weeks, come to the Q+A and ask questions
5. Start assignments early
6. If you get stuck, balance perseverance with asking for help. Come up with a question whose answer will help you learn and get unstuck
7. Do the practice exam.

Common questions about this course

1. Why are we studying this?
2. What are applications?
3. Will this course help me become a better programmer?
4. What practical skills will we learn?
5. How is this course different from other courses in CS?

For answers, read the welcome post on Ed!

Etiquette

Discussions and comments (in Lectures, tutorials, Ed Forum) should be polite, and be used to facilitate learning of COMP2022.

Feel free to continue non COMP2022 discussions elsewhere.