UNSW Course Outline

COMP1511 Programming Fundamentals - 2023

Course Code : COMP1511
Year : 2023
Term : Term 3
Teaching Period : T3
Delivery Mode : Multimodal
Delivery Format : Standard
Delivery Location : Kensington

General Course Information

Course Code : COMP1511
Year : 2023
Term : Term 3
Teaching Period : T3
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Computer Science and Engineering
Delivery Mode : Multimodal
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

From recent innovations in AI like self-driving cars to humanoid robotics navigating complex

environments, leapfrogs in battery technology to sequencing the human genome - the world is benefiting and evolving thanks to computer systems. At the core of all these systems are computers executing instructions to solve exciting problems.

In this course, you will learn the fundamentals of how we instruct computers to solve problems. You will explore the architecture and mechanics of how computers operate and how you can translate real-world problems to computer programs that solve these problems.

The concepts you learn will provide a foundation for your future endeavours in computing and, we hope, will begin to change the way you think about real-world problems.

This course is an introductory course to the basics of Computer Programming and Computer Science. It is intended as an introduction to studying further in Computer Science or related fields. Topics include:

- Fundamental programming concepts
- Introduction to Computer Science
- The C programming language and use of a C compiler
- Programming style
- Program design and organisation concepts
- Program testing and debugging

Course Aims

The importance of this course lies in its role as the foundation of your programming journey, providing essential knowledge and skills vital for your success in the field. By focusing on proficiency in the high-level programming language C and fostering problem-solving abilities, this course equips you with the fundamental tools and mindset necessary to think like a programmer.

As the first course in the program, it plays a crucial role in setting the stage for your future learning. It serves as a prerequisite for many of the core courses, ensuring that all students begin with a solid understanding of the fundamental concepts required to progress further. By establishing a common knowledge base and skills, this course ensures that everyone starts on an equal footing and can effectively tackle more advanced topics.

This course intends to guide you through the initial stages of your programming education, imparting technical proficiency in C and the ability to approach problems systematically and think critically. By emphasizing problem-solving strategies, debugging techniques, and testing methodologies, the course aims to instill in you a resilient and adaptable mindset that will serve as a solid foundation for your future development as a programmer.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Apply C programming language to solve simple decision, looping, array, and linked list problems programmatically
CLO2 : Review the produced code against specification criteria by applying testing techniques
CLO3 : Apply basic data structures, such as arrays and linked lists, to solve complex problems
CLO4 : Read and understand coding solutions.

Course Learning Outcomes	Assessment Item
CLO1 : Apply C programming language to solve simple decision, looping, array, and linked list problems programmatically	• Problem Sets • Assignments 1 and 2 • Final Exam
CLO2 : Review the produced code against specification criteria by applying testing techniques	• Problem Sets • Assignments 1 and 2 • Final Exam
CLO3 : Apply basic data structures, such as arrays and linked lists, to solve complex problems	• Problem Sets • Assignments 1 and 2 • Final Exam
CLO4 : Read and understand coding solutions.	• Problem Sets • Assignments 1 and 2 • Final Exam

Learning and Teaching Technologies

Microsoft Teams | EdStem | https://cgi.cse.unsw.edu.au/~cs1511/23T3/

Learning and Teaching in this course

This course has a heavy practical orientation. Lectures will revolve around live demonstrations of programming and the use of tools. Problem sets in labs and assignments are also highly practical.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Problem Sets Assessment FormatIndividual	15%	Due DateWeek 2 - Week 10
Assignments 1 and 2 Assessment FormatIndividual	45%	Due DateWeek 7: 23 October - 27 October, Week 10: 13 November - 17 November
Final Exam	40%	Due DateTBA - Exam Period

Assessment FormatIndividual		

Assessment Details

Problem Sets

Assessment Overview

Each problem set will be submitted using the "give" system. All students will need to submit solutions to the Problem Sets each week (weeks 2-10).

Problem sets will be marked automatically one week after the due date. When marking is complete you can see marks online using the course website.

Problem Sets have an indicator to help you choose which problems to do -- you should prioritise the one-dot exercises first, then two-dot, then three. You must complete all one-dot and two-dot exercises to get full marks in the problem set for the Week. Any three-dot exercises you complete will form extra bonus marks to compensate for any other missing marks in the problem set component.

There are no marks for Problem Set 1, it's there to help you get started. You will see a 0 as a total for Problem Set 1, as it is not counted towards your final mark.

Problem sets are capped at 15 ***marks*** (there are 4 possible bonus marks from the three-dot exercises that can bring you up to a total of 15 if you missed out on any other marks in the one- or two-dot exercises). ***Completing just the one- and two-dot exercises every week*** can give you the full 15 marks needed in this component.

Assignments 1 and 2

Assessment Overview

There are two assessable programming assignments. Assignments allow you to practice what you have learned on relatively large problems (compared to the small exercises in the labs). Assignments are a very important part of this course, therefore it is essential that you attempt them yourself. Collaboration with other students is limited to discussion of fundamentals, not any discussion of assignment specifics.

- Assignment 1, 20%
- Assignment 2, 25%

Assignments will be automarked, and feedback on programming style will be given by tutors.

Detailed Assessment Description

Assignment 1 - Arrays and more complex Control Flow - Due Week 7 (20%)

Assignment 2 - Linked Lists - Due Week 10 (25%)

Final Exam

Assessment Overview

3-hour-long in-person exam taking place in exam period.

The exam will contain implementation tasks that will require you to write C programs. It will also contain sections that require you to read code or answer questions to show your knowledge of programming.

During this exam, you will be able to execute, debug and test your answers. The implementation tasks will be similar to those encountered in your weekly Problem Sets.

We will provide you with sample questions in the last week of the course.

Special Exam Requirements
There are two requirements for the final exam.

Requirement#1: on the final exam you must solve a task by writing a program that uses an array. There will be multiple, clearly marked, questions that will involve the use of an array. You must pass one of these questions (by receiving at least 50% of the available marks) to meet this requirement.

Requirement#2: on the final exam you must solve a task by writing a program that uses a linked list. There will be multiple, clearly marked, questions that will involve using a linked list. You must pass one of these questions (by receiving at least 50% of the available marks) to meet this requirement.

You cannot pass COMP1511 unless you achieve both the above requirements.

General Assessment Information

Grading Basis

Standard

Requirements to pass course

Requirement#1: on the final exam you must solve a task by writing a program that uses an array. There will be multiple, clearly marked, questions that will involve the use of an array. You must pass one of these questions (by receiving at least 50% of the available marks) to meet this requirement.

Requirement#2: on the final exam you must solve a task by writing a program that uses a linked list. There will be multiple, clearly marked, questions that will involve using a linked list. You must pass one of these questions (by receiving at least 50% of the available marks) to meet this requirement.

You can not pass COMP1511 unless you achieve both the above requirements

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 11 September - 15 September	Lecture	Course intro UNIX + Tools What is a program
	Lecture	Variables/Constants
	Tutorial	Welcome What is programming?
	Laboratory	Setting up your environment Basic Input/Output
Week 2 : 18 September - 22 September	Lecture	Control Flow
	Lecture	Custom Data Types
	Tutorial	Control Flow and Variables
	Laboratory	Basic control flow Variables
Week 3 : 25 September - 29 September	Lecture	Procedures Functions
	Lecture	Static Arrays
	Tutorial	Custom Data Types
	Laboratory	Custom Data Types
Week 4 : 2 October - 6 October	Lecture	2D Arrays
	Lecture	Strings

	Tutorial	Functions
	Laboratory	Functions Arrays Strings
Week 5 : 9 October - 13 October	Lecture	Lecture Program 1: Arrays
	Lecture	Pointers
	Tutorial	Arrays
	Laboratory	Arrays Pointers
Week 6 : 16 October - 20 October	Other	*Flexibility Week, NO LECTURE, NO Tutorials, NO Labs*
Week 7 : 23 October - 27 October	Lecture	Dynamic arrays Memory
	Lecture	Memory (heap vs stack) Basic linked list
	Tutorial	Pointers
	Laboratory	Memory allocation
Week 8 : 30 October - 3 November	Lecture	Linked Lists
	Lecture	Linked Lists
	Tutorial	Malloc and start of Linked Lists
	Laboratory	Linked Lists

Week 9 : 6 November - 10 November	Lecture	Lecture Program 2: Linked Lists
	Lecture	Extra Content (Non-Examinable)
	Tutorial	Linked Lists
	Laboratory	Linked Lists
Week 10 : 13 November - 17 November	Lecture	Exam details
	Lecture	Revision of course content
	Tutorial	Course Revision
	Laboratory	Exam practice (past exam questions)

Attendance Requirements

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

General Schedule Information

Schedule information will be clearly communicated elsewhere.

Course Resources

Recommended Resources

There is no requirement for a textbook for COMP1511. Generally, students do not purchase this textbook. It covers material in a different way from the COMP1511 course materials and goes into differing levels of content than this course. It may, however, be useful as a reference, or to explore some content in more detail.

The optional textbook for the course is: *Programming, Problem Solving, and Abstraction with C* , ISBN 978 1 74103 080 3, which can be purchased from the UNSW Bookshop.

Course Evaluation and Development

At the end of every term, COMP1511 students are invited to provide their feedback about the course through the UNSW myExperience online survey system. This is used to assess the quality of the course so that we can make ongoing improvements. We do take this feedback seriously and use it to improve the course materials and their delivery. Students are also encouraged to provide informal feedback during the term by letting the Lecturer in Charge or any of the course staff, know of any problems, as soon as they arise. Suggestions will be listened to openly, positively, constructively, and thankfully, and every reasonable effort will be made to address them. Recent myExperience evaluations showed that students were highly satisfied with most aspects of the course. However, there are always things that can be improved, some changes that we are making this term:

- Rewighting the amount of work required for assignment 1
- Experimenting with a new hybrid lecture format

CSE may also run its own survey, midway through the term, to elicit feedback while courses are still running. This course improves only because we see the difficulties that students have and try to adjust things so that you get to learn what you need. If anything's not working for you, please let us know and we'll do whatever we can to help and hopefully help students in later cohorts as well.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Administrator	COURSE EMAIL	cs1511@unsw.edu.au				No	No
Convenor	Jake Renzella	jake.renzella@unsw.edu.au				No	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 / Submit rule, which means that if you sit an exam or submit a piece of assessment, 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 polices. 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.

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 Plagarism

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.