UNSW Course Outline

ZEIT2102 Computer Technology - 2024

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General Course Information

Course Code : ZEIT2102
Year : 2024
Term : Semester 2
Teaching Period : Z2
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Systems and Computing
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

The course presents the fundamental aspects of computing, which include historic views on analogue and biological computing, and then focuses on the most important technologies for digital and neuromorphic computing. For digital computing the discussions cover binary logic

and arithmetic, hardware and instruction set architectures and the fundamental concepts that underlie operating systems. For neuromorphic computing the course investigates the fundamental concepts related to artificial neural networks, and presents several neuromorphic applications enabled by the digital computing technologies presented earlier in the course.

Course Aims

The course aims for students to understand the operation of digital computers and the concepts that underlie operating systems and neuromorphic computing and develop a further understanding of topics related to computational intelligence, autonomous systems and security, where general purpose digital computing, general purpose GPU (GP-GPU) computing, or neuromorphic computing are the pertinent applicable technologies.

Relationship to Other Courses

This course has ZEIT 1102: Introduction to Programming as a formal prerequisite.

Course Learning Outcomes

Course Learning Outcomes	Australian Computing Society (ACS)
CLO1 : Analyse how digital computing devices operate at various abstraction levels from binary logic and arithmetic to instruction set architecture (programming model).	• ACS : Hardware & software
CLO2 : Design the digital computing unit(s) required to solve real-world problems.	• ACS : Hardware & software
CLO3 : Apply fundamental operating systems concepts to real-world problem-solving examples.	• ACS : Programming • ACS : Hardware & software
CLO4 : Apply the key concepts of neuromorphic and neural computing to solving real-world problems.	• ACS : Modelling, abstraction, design

Course Learning Outcomes	Assessment Item
CLO1 : Analyse how digital computing devices operate at various abstraction levels from binary logic and arithmetic to instruction set architecture (programming model).	• Lab reports • Assignment • Tutorial Test • Final Exam
CLO2 : Design the digital computing unit(s) required to solve real-world problems.	• Assignment • Final Exam
CLO3 : Apply fundamental operating systems concepts to real-world problem-solving examples.	• Lab reports • Tutorial Test • Final Exam
CLO4 : Apply the key concepts of neuromorphic and neural computing to solving real-world problems.	• Lab reports • Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

The formal content of this course is delivered via lectures and workshops; the former will be a mixture of formal lecturing and flip-mode classes, the latter will comprise a combination of laboratory exercises, tutorials, and discussions on the course assignments. The laboratory exercises and tutorials explore and expand upon the concepts presented during the formal presentations. As part of your weekly study activities, you will read and research beyond the material provided, to establish the context within which the body of knowledge resides.

Course materials will be progressively published on the course's Moodle web site.

Students will confirm the major learning outcomes of this course through the completion of the assessment items.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Lab reports Assessment Format: Individual	15%	Due Date: Various
Assignment Assessment Format: Individual Short Extension: Yes (2 days)	28%	Due Date: 23/08/2024 11:55 AM
Tutorial Test Assessment Format: Individual	17%	Due Date: Week 8: 16 September - 20 September
Final Exam Assessment Format: Individual	40%	Due Date: Exam week.

Assessment Details

Lab reports

Assessment Overview

Lab work focus on completion of practical tasks. More details and submission points will be given via Moodle.

Course Learning Outcomes

- CLO1 : Analyse how digital computing devices operate at various abstraction levels from binary logic and arithmetic to instruction set architecture (programming model).
- CLO3 : Apply fundamental operating systems concepts to real-world problem-solving examples.
- CLO4 : Apply the key concepts of neuromorphic and neural computing to solving real-world problems.

Detailed Assessment Description

Lab work is to be undertaken with a lab partner, but the report to be submitted individually as an individual assessment. There will be 6 labs throughout the course. Exact submission points will be given via Moodle.

Lab 1 feedback will be given prior to the census date.

Assignment

Assessment Overview

This assignment is an individual task that covers the digital computers' operation (binary logic/ arithmetic, and hardware and instruction set architecture).

Course Learning Outcomes

- CLO1 : Analyse how digital computing devices operate at various abstraction levels from binary logic and arithmetic to instruction set architecture (programming model).
- CLO2 : Design the digital computing unit(s) required to solve real-world problems.

Detailed Assessment Description

Assignment is an individual task with deliverable in week 6.

Tutorial Test

Assessment Overview

Tutorial test scaffolds the exam.

Course Learning Outcomes

- CLO1 : Analyse how digital computing devices operate at various abstraction levels from binary logic and arithmetic to instruction set architecture (programming model).
- CLO3 : Apply fundamental operating systems concepts to real-world problem-solving examples.

Detailed Assessment Description

Tutorial test will be held in class in week 8.

Final Exam

Assessment Overview

Final examination will cover all learning outcomes.

Course Learning Outcomes

- CLO1 : Analyse how digital computing devices operate at various abstraction levels from binary logic and arithmetic to instruction set architecture (programming model).
- CLO2 : Design the digital computing unit(s) required to solve real-world problems.
- CLO3 : Apply fundamental operating systems concepts to real-world problem-solving examples.
- CLO4 : Apply the key concepts of neuromorphic and neural computing to solving real-world problems.

<u>Detailed Assessment Description</u>

The exam will be held in the exam session and will cover all CLOs.

General Assessment Information

Use of Generative AI in Assessments

For tutorial test and final exam: NO ASSISTANCE

No assistance:

It is prohibited to use any generative AI to search for or generate information or answers. If such use is detected, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

For Assignment and lab work: DRAFTING ASSISTANCE

Drafting Assistance:

As this assessment task involves some planning or creative processes, you are permitted to use software to generate initial drafts [or ideas, structures, etc]. However, you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., what is generated by the software should not be a part of your final submission. It is a good idea to keep copies of your initial drafts to show your lecturer if there is any uncertainty about the originality of your work. Please note that your submission will be passed through an AI-text detection tool. If your marker has concerns that your answer contains passages of AI-generated text that have not been sufficiently modified you may be asked to explain your work, but we recognise that you are permitted to use AI generated text as a starting point and some traces may remain. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

* Please note that the outputs from these tools are not always accurate, appropriate, nor properly reference. You should ensure that you have moderated and critically evaluated the outputs from generative AI tools such as ChatGPT before using them for drafting/planning assistance.

Please read each assessment instructions carefully, as assessment instructions may override this default AI use statement depending on the nature of assessment.

Grading Basis

Standard

Requirements to pass course

To pass the course you **must** get a final mark of at least 50% for the whole course marks.

Please note that final marks in this course may be moderated. For details about mark expectations and interpreting results, see the UNSW Guide to Grades on MyUNSW at:

https://my.unsw.edu.au/student/academiclife/assessment/GuideToUNSWGrades.html

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is **the only official mark.**

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 15 July - 19 July	Lecture	Introduction to computing.
	Tutorial	Totorial 1 (Introduction to computing)
Week 2 : 22 July - 26 July	Lecture	Binary logic and arithmetic
	Tutorial	Tutorial 2 (Binary)
	Laboratory	
Week 3 : 29 July - 2 August	Lecture	Digital Architecture
	Tutorial	Tutorial 3 (Digital Architecture)
	Laboratory	
Week 4 : 5 August - 9 August	Lecture	Digital Architecture 2
	Tutorial	Tutorial 4 (Digital architecture 2)
	Laboratory	
Week 5 : 12 August - 16 August	Lecture	MIPS
	Tutorial	Friday - Military Training day Friday time table on Tuesday. Tutorial 5 (MIPS)
	Laboratory	Friday - Military Training day Friday time table on Tuesday.
Week 6 : 19 August - 23 August	Lecture	OS Introduction and processes
	Laboratory	
	Assessment	Assignment Due on 23/08/2024.
Week 7 : 9 September - 13 September	Lecture	OS threads and synchronisation OS scheduling
	Tutorial	Tutorial 6
	Laboratory	
Week 8 : 16 September - 20 September	Lecture	Monday - OS Deadlocks Wednesday - Military training day
	Assessment	Tutorial test will be held in the tutorial slots.
	Laboratory	
	Tutorial	Tutorial Test
Week 9 : 23 September - 27 September	Lecture	Deadlocks 2
	Tutorial	Tutorial 7 (Scheduling)
	Laboratory	
Week 10 : 30 September - 4 October	Lecture	OS memory
	Tutorial	Tutorial 8 - Deadlocks
	Laboratory	
Week 11 : 7 October - 11 October	Lecture	Monday - Lost (Labour day) Wednesday - GPU Friday - Labs and tutes are lost (Military training day)
Week 12 : 14 October - 18 October	Lecture	NN
	Tutorial	Tutorial 10 (memory)
	Laboratory	
Week 13 : 21 October - 25 October	Lecture	Course Summary
	Laboratory	

Attendance Requirements

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

General Schedule Information

The pace of lecturing will be constantly adjusted to the pace of learning of the students. The details of the content of the individual topics will be available on the Moodle Course site but an overall outline is provided here for reference.

The indicative topic schedule for the course is shown below, in the course schedule section.

Course Resources

Recommended Resources

- Jon Stokes (2006). *Inside the machine: an illustrated introduction to microprocessors and computer architecture*. No Starch Press – ARS technical library. ISBN-13: 978-1-59327-668-3

- Silberchatz Abraham (2018). Operating Systems Concepts – 10th edition. Wiley. ISBN: 781119456339

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of this course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the "On-going Student Feedback" link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups. Student opinions really do make a difference. Refer to the Moodle site for this course to see how the feedback from previous students has contributed to the course development.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Erandi Hene Kankanamge		Room 116, Building 15	+61 2 5114 5157	By appointment	No	Yes
Lecturer	Wendy Chen		203, Building 15	(02) 5114 5432	By appointment	No	No

Other Useful Information
School-specific Information

The Leaning Management System

Moodle is the Learning Management System used at UNSW Canberra. All courses have a Moodle site which will become available to students at least one week before the start of semester. Please find all help and documentation (including Blackboard Collaborate) at the Moodle Support page.

UNSW Moodle supports the following web browsers:

• Google Chrome 50+

• Safari 10+

Internet Explorer is not recommended. Addons and Toolbars can affect any browser's performance.

Operating systems recommended are:

• Windows 10,

• Mac OSX Sierra,

• iPad IOS10

Further details:

[Moodle System Requirements](#)

[Moodle Log In](#)

If you need further assistance with Moodle:

For enrolment and login issues please contact:

IT Service Centre

Email: itservicecentre@unsw.edu.au

Phone: (02) 9385-1333

International: +61 2 9385 1333

For all other Moodle issues please contact:

External TELT Support

Email: externalteltsupport@unsw.edu.au

Phone: (02) 9385-3331

International: +61 2 938 53331

Opening hours:

Monday – Friday 7:30am – 9:30 pm

Saturday & Sunday 8:30 am – 4:30pm

[Study at UNSW Canberra](#)

Study at UNSW Canberra has lots of useful information regarding:

• Where to get help

• Administrative matters

• Getting your passwords set up

• How to log on to Moodle

• Accessing the Library and other areas.

[UNSW Canberra Student Hub](#)

For News and Notices, Student Services and Support, Campus Comminity, Quick Links, Important Dates and Upcoming Events

School Contact Information

Deputy Head of School (Education): Dr Erandi Hene Kankanamge

E: e.henekankanamge@adfa.edu.au

T: 02 5114 5157

Syscom Admin Support: syscom@unsw.edu.au

T: 02 5114 5284

Syscom Admin Office: Building 15, Level 1, Room 101 (open 10am to 4pm, Mon to Fri)