ZEIT2208: Programmable Digital Systems
-Semester 1, 2020

Course Outline

Course Staff

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We are usually available for consultation during normal working hours. Please phone or email to make an appointment.

Course Details

This 6 UOC course provides a thorough examination of modern digital systems. Topics covered include: introduction to the C programming language for embedded processor development, practical timing constraints when implementing digital logic circuits, registers and counters, operation of standard TTL and CMOS devices, interfacing digital circuits from different logic families, digital-to-analogue conversion, analogue-to-digital conversion, digital memory architectures, microcontrollers, programmable logic devices, introduction to field programmable gate arrays (FPGAs), Introduction to the VHDL hardware description language, introduction to digital communications, computer buses and serial communications interfaces, introduction to computer networking.

Student Learning Outcomes

At the successful conclusion of this course students will be able to:

LO1. Describe the operation of commonly used components of a digital system.

LO2. Demonstrate the ability to implement components of a digital system in the C and VHDL programming languages.

LO3. Analyse electrical circuits commonly used in digital systems.

LO4. Design components of a digital system that can be implemented using the C and VHDL programming languages.

LO5. Evaluate the advantages and disadvantages of different approaches to designing and implementing a modern programmable digital system.

Developing Graduate Capabilities

Successful completion of this course contributes to the acquisition of UNSW graduate capabilities. UNSW aspires to develop globally focused graduates who are **rigorous scholars**, capable of **leadership** and **professional practice** in an **international** community.

Teaching Strategies

This is a course that supplements a significant laboratory component with enabling lectures. The tasks being assessed are guided by tutorials and involve the design and development of complex systems that are controlled by a microprocessor,

programmed in the C language. We rely on the similarities between the C language and Java (at the level needed for embedded software development), to accelerate your learning of C, and build on the outcomes of Introduction to Electrical Engineering.

The Learning 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 7, 10, Mac OSX Sierra, iPad IOS10
For further details about system requirements click here.
Log in to Moodle here.

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

Resources for Students

The compulsory textbook for this course:

"Digital Systems: Principles and Applications, Global Edition", (12th Edition) by Neal Widmer, Greg Moss and Ronald Tocci, *Pearson Higher Ed*, USA

can be purchased from these sites:

https://www.pearson.com.au/9781292162003

https://www.amazon.com.au/Digital-Systems-Principles-Applications-Global/dp/1292162007

Course Schedule

Week	Topic
1	Programming in C
2	Programming in C
3	Digital Hardware Devices
4	Microcontrollers
5	Microcontrollers
6	Programmable Devices
7	Programming in VHDL
8	Programming in VHDL
9	Class Test
10	Digital Communications and Security
11	Computer Buses and Networking
12	Internetworking
13	Internetworking
14	Revision

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.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct Policy

https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Other Information

All students are required to wear appropriate footwear while in laboratories. This means covered shoes in all laboratories. Students who do not have appropriate footwear will be asked to leave the laboratory space.

Assessment Requirements

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

All assignments must be submitted electronically using Moodle by 11:55 pm on the due date. Upon submission of your work you should receive an email acknowledgement.

The assessment for this course will be as follows:

Laboratory Assignments

There will be 4 Laboratory Assignments. All assignments will be assessed as Satisfactory (S) or Fail (F). Constructive feedback will be uploaded to Moodle within 10 working days of the due date for the assignment.

Quizzes

There will be 10 quizzes. The quizzes will cover each of the major topics presented in the course. The quizzes will have no time limit and can be attempted as many times as necessary. A mark of 85% or higher for every quiz is required to receive a Satisfactory grade for the quizzes.

The assessment due dates are as follows:

Assessment	**Due Date**
Assignment 1	20th March
Assignment 2	27th April
Assignment 3	15th May
Assignment 4	12th June
Quizzes	19th June

Outcomes-Assessment Matrix

Assessment item	**LO 1**	**LO 2**	**LO 3**	**LO 4**	**LO 5**
Assignment 1	x	x			
Assignment 2	x	x	x	x	
Assignment 3		x	x	x	x
Assignment 4		x		x	x
Quizzes	x		x		x

All learning outcomes must be achieved to receive a grade of Satisfactory for the course. Achieving a learning outcome is demonstrated by receiving a grade of Satisfactory in **at least one** of the assessments which test that learning outcome. Final Satisfactory/Fail assessment in this course may be moderated.

Late Submission of Assessment

Assessment items submitted more than 5 calendar days late will not be assessed and will receive a grade of Fail

All requests for special consideration must be formally submitted via MyUNSW prior to the assessment due date.

Referencing

In this course, students are required to reference following the APA 6 / Chicago NB referencing style. Information about referencing styles is available at:
https://guides.lib.unsw.adfa.edu.au/c.php?g=472948&p=3246720

Academic Integrity 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. All students are expected to adhere to UNSW's Student Code of Conduct
https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Plagiarism undermines academic integrity and is not tolerated at UNSW. It is defined as using the words or ideas of others and passing them off as your own, and can take many forms, from deliberate cheating to accidental copying from a source without acknowledgement.

For more information, please refer to the following:

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

Getting Started Guide

https://www.unsw.adfa.edu.au/getting-started-1
The Getting Started Guide 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.

Additional Information as required

CRICOS Provider no. 00098G
The University of New South Wales Canberra.