Course Outline Public

Edit Resource (/COMP9032/19T3/resources/32778/edit)

Contents

- Course Details
- Course Summary
- Advantageous Knowledge
- Student Learning Outcomes
- Teaching Strategies
- Teaching Rationale
- Student Conduct
- Assessment
- Course Plan
- Resources for Students
- Course Evaluation and Development

Course Details

Course Code	COMP9032
Course Title	Microprocessors and Interfacing
Convenor	Hui Guo (/users/z3068443)
Admin	Hui Guo (/users/z3068443)
Classes	**Lectures** : Mon 18-20 (w1-3,5-11, ChemSc M18); Wed 18-20 (w1-10, ChemScM17) Timetable for all classes (/COMP9032/19T3/timetable)
Consultations	Fri. 15:00-17:00, K17-501F
Units of Credit	6
Course Website	http://cse.unsw.edu.au/~cs9032/19T3/ (http://cse.unsw.edu.au/~cs9032/19T3/)
Handbook Entry	http://www.handbook.unsw.edu.au/postgraduate/courses/current/COMP9032.html (http://www.handbook.unsw.edu.au/postgraduate/courses/current/COMP9032.html)

Course Summary

This course is to introduce students to the basic concepts and structure of the microprocessor and microcontroller, and provide students with knowledge and skills for solving problems with microprocessor/microcontroller.

Advantageous Knowledge

Before commencing this course, it is helpful if students have basic knowledge about :

- binary number
- C programming
- digital circuits

Which will also be briefly discussed in the course.

Student Learning Outcomes

On successfully completing this course, students will

- know the fundamentals of microprocessor,
- understand typical interface designs between hardware and software and how C programs are converted into machine code,
- understand how serial communication works and how analog signals are converted into digital signals and vice versa,
- be familiar with AVR assembly language programming, and
- develop basic development skills for microprocessor/microcontroller applications.

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	lecture discussions, lab exercises, assignment
Entrepreneurial leaders capable of initiating and embracing innovation and change, as well as engaging and enabling others to contribute to change	lab exercises
Professionals capable of ethical, self- directed practice and independent lifelong learning	lab exercises and assignment
Global citizens who are culturally adept and capable of respecting diversity and acting in a socially just and responsible way	lectures and lab classes

Teaching Strategies

- Lectures introduce concepts, theories and show examples of how to design and implement a microprocessor application system.
- Labs enhance the understanding of what has been discussed in the lecture, and also provide opportunities to work with other students.
- The assignment allows students to solve a given problem by using what has been learned in the course.

Teaching Rationale

This course teaches both theory and skills needed to design and implement systems utilising microprocessors. Passing this course involves keeping up with the theory and completing the lab exercises. The lab work brings the theory alive and clarifies deeper issues. Without the theory, the lab work is difficult to master. Each therefore complements the other, and both require your time and effort.

It is our belief that certain activities make a world of difference to your learning experience at the university. You should:

- actively participate in lectures - if something is unclear, ask for clarification. If you don't understand something, try to figure it out when you reflect upon the material during private study, and if you still don't get it, raise it during the next class;
- do not imagine you are the only one having trouble with something; chances are someone else is having trouble as well. However, lecturers or tutors aren't necessarily aware of your problems, so please let them know when something is troubling you; do not leave the problem too late till it is hard to fix.
- prepare for labs by reading up what is expected well before your lab session - sometimes you will need to complete some preparatory exercises - lab time is too valuable to waste on preparations that could have been completed beforehand.

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'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.

Plagiarism is defined as (https://student.unsw.edu.au/plagiarism) using the words or ideas of others and presenting them as your own. UNSW and CSE treat plagiarism as academic misconduct, which means that it carries penalties as severe as being excluded from further study at UNSW. There are several on-line sources to help you understand what plagiarism is and how it is dealt with at UNSW:

- Plagiarism and Academic Integrity (https://student.unsw.edu.au/plagiarism)
- UNSW Plagiarism Procedure (https://www.gs.unsw.edu.au/policy/documents/plagiarismprocedure.pdf)

Make sure that you read and understand these. Ignorance is not accepted as an excuse for plagiarism. In particular, you are also responsible that your assignment files are not accessible by anyone but you by setting the correct permissions in your CSE directory and code repository, if using. Note also that plagiarism includes paying or asking another person to do a piece of work for you and then submitting it as your own work.

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

- Student Misconduct Procedure (https://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.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)

You should also read the following page which describes your rights and responsibilities in the CSE context:

- Essential Advice for CSE Students (https://www.engineering.unsw.edu.au/computer-science-engineering/about-us/organisational-structure/student-services/policies/essential-advice-for-cse-students)

Assessment

Item	Topics	Due	Marks
Mid-term exam	Topics of Weeks 1-3	Week 5	20%
Assignment	TBA	Week 10	15%
Labs	Varies Topics	Weeks 3-10	20%
Final Exam	All topics	Exam period	45%

Late Penalties

You are expected to complete each lab on time. The maximum lateness allowed for a lab is ONE WEEK and a 20% late penalty will be applied. For the assignment, the late penalty is 10% off per day.

Course Plan

Lectures:

From Week 1 to Week 8, there are four-hour lectures. The following topics will be covered:

- Basics of Computing with Microprocessor Systems
- Instruction set architecture
- AVR assembly programming and assembly process
- Interrupt
- Input and Output
- Serial communication
- Analog/digital and digital/analog conversion

Laboratories:

The first lab starts in **Week 1** . Each week you are required to attend a compulsory two-hour laboratory.

You work in the laboratory in a group of TWO students. If you intend to work with a partner of your choice, let your partner select the same laboratory class as yours. Otherwise, you will be randomly paired with another student if you haven't chosen a partner by the time of the first lab.

There will be four labs. Each lab (except lab0) consists of a number of tasks. Your work will be marked by the lab tutor.

You will use the AVR Studio to develop, debug and simulate your AVR assembly programs and use the AVR lab board to run your program. The AVR board will be used in lab 2 and lab 3. The lab tutor will assist you with the lab work. However, you cannot ask the tutor for the solution to a lab task.

You are strongly recommended to download AVR Studio and install it on your PC or laptop so that you can prepare the lab exercises and write program at home to meet the deadline for each lab task.

Tutorials:

There will be no formal tutorial classes. However, you will be given some take-home questions based on the lecture material. Solutions to some of the questions will be discussed in the following lecture class.

Assignment:

There will be one project in this term. You are required to complete it on your own. The assignment will be released in Week 6 and due in Week 10.

Mid-term exam:

During the lecture in Week 5 (Oct. 14), there will be a 60-minute mid-term exam. The location is to be decided.

Final exam:

There will be a two-hour exam at the end of this course. It is a closed book exam, covering materials from lectures, labs, tutorials and the assignment.

Resources for Students

References:

- Fredrick M. Cady: Microcontrollers and Microcomputers —Principles of Software and Hardware Engineering, Oxford University Press, 2 nd Edition, 2010
- AVR data sheet and instruction manual (online)
- Lab board I/O connection diagrams (online)

Course Evaluation and Development

This course is evaluated each session using the myExperience system. Your feedback is highly appreciated.

Resource created 8 months ago (Monday 09 September 2019, 10:34:40 AM), last modified 7 months ago (Sunday 15 September 2019, 03:59:34 PM).

Comments

(/COMP9032/19T3/forums/search?forum_choice=resource/32778)

(/COMP9032/19T3/forums/resource/32778)



Kook Jin Noh (/users/z3018780) 7 months ago (Mon Oct 14 2019 19:36:26 GMT+1100 (Australian Eastern Daylight Time))

Can we have mid-term exam paper and solution?

Edit Delete



Kook Jin Noh (/users/z3018780) 7 months ago (Thu Oct 10 2019 08:41:09 GMT+1100 (Australian Eastern Daylight Time))

Hi when's mid-term exam?

Edit Delete



Hugh Deacon (/users/z3389639) 7 months ago (Thu Oct 10 2019 10:01:40 GMT+1100 (Australian Eastern Daylight Time))

At 6:10-7:10pm in next Monday's lecture (14 October).

Edit Delete



Kook Jin Noh (/users/z3018780) 7 months ago (Thu Oct 10 2019 13:30:11 GMT+1100 (Australian Eastern Daylight Time))

Was there announcement on this in lecture? I couldn't find one on moodle. Is it multiple choice? what's the format?

Edit Delete



Hugh Deacon (/users/z3389639) 7 months ago (Thu Oct 10 2019 13:35:35 GMT+1100 (Australian Eastern Daylight Time))

These details were mentioned at the end of last night's lecture. It will be closed-book, pen & paper test, ~4 or 5 questions (made up of several smaller parts). Not multiple choice. You'll need to write code. The test will cover most subjects of week 1-3, excluding I/O. That's all I can remember!

Edit Delete



Zijian Zhang (/users/z5171560) 7 months ago (Mon Sep 23 2019 12:06:54 GMT+1000 (Australian Eastern Standard Time))

- hi, I tried to find a pdf version of this textbook but didn't find it in the internet, if anyone have this pdf version , could u share this with me? really appreciate it.
- my email address is zzj.sheldon@gmail.com
- or u can leave a link to me.
- thank u very much
- Fredrick M. Cady: Microcontrollers and Microcomputers —Principles of Software and Hardware Engineering, Oxford University Press, 2 nd Edition, 2010

Edit Delete