Course Outline

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Course Code	COMP6733
Course Title	IoT Design Studio
Units of Credit	6
Lecturer	Wen Hu
Admin	Qi Lin
Classes	Lectures: Tue 11:00-13:00 Hrs, Thu 15:00 -17:00 Hrs, On-line (Zoom Lectures (https://webcms3.cse.unsw.edu.au/COMP6733/20T3/resources/50021)) , (Campus Map (https://ibb.co/qrMb2F2)) Timetable (https://webcms3.cse.unsw.edu.au/COMP6733/20T3/timetable) for all classes.
Consultations	Thursday: 14:00 - 14:50 Venue: on-line (Zoom Consultations (https://webcms3.cse.unsw.edu.au/COMP6733/20T3/timetable))

Course Website	https://webcms3.cse.unsw.edu.au/COMP6733/20T3/ (https://webcms3.cse.unsw.edu.au/COMP6733/20T3/)
Course Contact Email	cs6733@cse.unsw.edu.au
Handbook Entry	https://www.handbook.unsw.edu.au/undergraduate/courses/current/COMP6733 (https://www.handbook.unsw.edu.au/undergraduate/courses/current/COMP6733)

Course Summary

The aim of the lectures is to facilitate learning and understanding of the important concepts within the course syllabus. Lecture notes will be available at the course web site for downloading before the lecture. In addition to attending the lectures (**mandatory**), students are also asked to study the recommended reading materials before and after the lecture. A number of study problems will be issued each week. These problems give the students a chance to test whether they have understood concepts that are introduced in the lecture. Time in the lecture, if available, may be used to discuss some of these study problems. Solutions to these problems will be available on the course web site.

This course will also provide practical training on programming Intenet of Things (IoT) devices. Each student will be loaned at least one IoT device during the duration of this course for them to work on the laboratory exercises and project.

Guided laboratory on IoT programming will take place from Weeks 1-5, 7 and 8 for 4 hours per week. Laboratory worksheet in self-study style will be issued on the course web site. A laboratory demonstrator will be available to help students with their work. Each laboratory exercise comes with an assessment exercise. Students are expected to demonstrate the assessment to their laboratory demonstrators in the next lab session in order to receive the allotted marks for the exercise.

The aim of project is to give students an opportunity to work on an extended development IoT project. The project work will be done in teams of up to 4 students.

Course Timetable

There will be 4 hours of lectures every week:

(i) 2-hour lecture on Tuesday 11:00 - 13:00 and

(ii) 2-hour lecture on Thursday 15:00 - 17:00

Both on-line (Zoom (https://webcms3.cse.unsw.edu.au/COMP6733/20T3/resources/50021)).

There will be 4-hour labs in Weeks 1-5, 7 and 8. The detailed lab schedule will be posted on The detailed course timetable is available here (https://webcms3.cse.unsw.edu.au/COMP6733/20T3/timetable)
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(https://webcms3.cse.unsw.edu.au/COMP3331/19T2/timetable)

Course Aims

Students will learn the fundamental principles behind designing IoT.

Topics include a selection from: IoT technology and services, IoT system architecture, Low Power communications (Bluetooth Low Energy and 6LoWPAN) and security issues, time synchronisation and localisation, sensor data smoothing and filtering, light-weight machine learning and data fusion, inertial sensing, activity recognition, biometric authentication and cloud services.

Student Learning Outcomes

Students successfully completing this course will have a working knowledge of the topics on IoT covered, and will be able to demonstrate their knowledge both by describing aspects of the topics and by solving problems related to the topics. They will have practical experience with the topics covered in the laboratory exercises and project undertaken.

This course contributes to the development of the following graduate capabilities:

Graduate Capability	Acquired in
Scholarship: of their discipline in its interdisciplinary context	Lectures, labs, problem set
Scholarship: Capable of independent and collaborative	Labs, problem set
Scholarship: rigorous in their analysis, critique, and reflection	Lectures, labs, problem set, project

Scholarship: able to apply their knowledge and skills to solving problems	Labs, problem set, project
Scholarship: capable of effective communication	Lectures, labs, project
Scholarship: digitally literate	All aspects of the course
Scholarship: information literate	All aspects of the course
Leadership: collaborative team workers	Labs, project
Professionalism: capable of independent, self-directed practice	All aspects of the course
Professionalism: capable of lifelong learning	All aspects of the course
Professionalism: capable of operating within an agreed Code of Practice	Labs, assignment, project
Global citizens: culturally aware and capable of respecting diversity and acting in socially /responsible ways	Labs, course forums

Pre-requisites / Co-requisites

- **COMP9331 or COMP3331 (Computer Networks and Applications)**
- **65 WAM**

Teaching Rationale

The course consists of the following learning components:

- Lecture of 2 x 2 hours per week (**students enrolled in COMP6733 are expected to attend all classes**)
- Guided laboratory work for 4 hours per week in Weeks 1-5, 7 and 8. (In Week 1, students need to collect special device, e.g., sensortag, for the labs from campus)
- Internet of Things project. (Students need to collect any special devices their projects need from campus).

The aim of the lectures is to facilitate learning and understanding of the important concepts within the course syllabus. Lecture notes will be available at the course web site for downloading before the lecture. In addition to attending the lectures (**mandatory**), students are also asked to study the recommended reading materials before and after the lecture. A number of study problems will be issued each week. These problems give the students a chance to test whether they have understood concepts that are introduced in the lecture. Time in the lecture, if available, may be used to discuss some of these study problems. Solutions to these problems will be available on the course web site.

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The aim of project is to give students an opportunity to work on an extended development IoT project. The project work will be done in teams of up to 4 students.

Teaching Strategies

- **Lectures:** introduce theory demonstrate how they apply in practice

- **Lab Work:** reinforce concepts taught in lectures by conducting hands-on experiments and network performance
- **Proble set:** allow students to solve problems based on content from lectures, develop problem-solving skills, assist with exam preparation
- **Project:** allow students to design and implement IoT systems and evaluate their performance
- **Consultations, Tutorials and Course Forum:** allow students an opportunity to ask questions and seek help.

Assessment

There will be four assessment components as listed below:

Component	Weight
Lab Exercises	30%
Problem Set	10%
Project plan and preliminary founding class presentation	15%
Project milestone class presentation	15%
Project final report (10%) and demo (20%)	30%

The following assessment rules apply:

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You must attempt all assessment components.
Your raw score is computed as the weighted sum (with the weightings listed above) of the score

Your final score will be computed according to the following rules:
If you obtain 40% or more for all three assessment components, your final score equals to your

If you obtain less than 40% for any one of the three assessment components, your final score is

If at least one of your assessment components is less than 40% and your raw score is 70, your f


If at least one of your assessment components is less than 40% and your raw score is 50, your f
```

Plagiarism is defined as (https://student.unsw.edu.au/what-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 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)
- 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 (https://www.gs.unsw.edu.au/policy/documents/plagiarismpolicy.pdf)
- UNSW Plagiarism Procedure (https://www.gs.unsw.edu.au/policy/documents/plagiarismprocedure.pdf)
- 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)

Make sure that you read and understand these. Ignorance is not accepted as an excuse for plagiarism. In particular, you are responsible for the of your assignment files such that they are not accessible by anyone but you by setting proper permissions on your CSE home directory and/or on online code repositories. 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.

Course Schedule

The following table lists the tentative weekly schedule. Students will be informed of any changes during the lecture and by announcements on the notices page.

Week	Lecture Dates	Lecturer	Lecture Topics	Labs	Remarks
1	15 & 17 Sep 2020	Wen	• Course organisation • Introduction to Internet of Things (IoT) and • Foundation topics on IoT	Getting started and Contiki fundamentals (Assessment to be demonstrated in the next lab)	• You will be loaned a SensorTag in your laboratory sessions. • List of projects posted.
2	21 & 24 Sep 2020	Wen, Hao Ni (WBS Tech)	• Low Power Communications: IEEE 802.15.4, Bluetooth Low Energy • RPL	Networking I (Assessment to be demonstrated in the next lab)	
3	29 Sep & 1 Oct 2020	Wen,	• LPWAN, CoAP, Web Services for Internet of Things • Time synchronisation	Networking II (Assessment to be demonstrated in the next lab)	Project teams and topics finalised
4	6 & 8 Oct 2020	Wen, Philip Valencia (CSIRO)/Matthew Lickwar (Ynomia)	• Localisation • BLEAT and its applications in construction site digitalisation	CoAP, Web services, and sensors (Assessment to be demonstrated in the next lab)	

Week	Lecture Dates	Lecturer	Lecture Topics	Labs	Remarks
5	13 & 15 Oct 2020	Wen	Project presentation (I)	RF Ranging/Localisation (Assessment to be demonstrated in Week 7)	Project Plan Due
6	20 & 22 Oct 2020		Break		
7	27 & 29 Oct 2020	Wen, Brano Kusy	• Light-weight machine learning and Signal Processing • Environmental monitoring	Machine Learning (Assessment to be demonstrated in the next lab)	
8	2 & 5 Nov 2020	Wen	Project presentation (II)		**Project Progress Report Due**
9	10 & 12 Nov 2020	Wen, Guest lecturer	• Advanced topic • TBD		Problem Set Due
10	17 &19 Nov 2020	Wen	Project work		Final Project Report due on 17:00, 22 Nov, Sunday.
11	23 Nov 2020	Wen	Project demo and interview		Return all equipment at the end of project demo and interview.

Resources for Students

IoT is a young, emerging and rapdily evolving field. Thus, the course materials will draw from books, professional journals and conference papers.

You will find the following books in the library to be of interest:

- Bahga and Madisetti, Internet of Things: A Hands-On Approach

- McEwen and Cassimally, Designing the Internet of Things

We will be using a number of journal or conference papers in this course. These will be provided on the course web site and you can access them using your zpass.

Guided laboratory and laboratory assessment:

Students are required to attend a guided laboratory from Weeks 1-5, 7 where they will learn programming IoT devices. Laboratory worksheets will be available on the course website. There will be a lab demonstrator assisting in the laboratory.

The equipment to be used is the SensorTag. Each student will be loaned one SensorTag for doing the laboratory and the project. The students will need to sign a loan form and undertake to return these motes in good condition. The motes will be handed out in the laboratory session in the first lab. You must return them at the end of your project demo and interview.

The first lab will provide a basic overview of Contiki and SensorTag. Each lab has an assessment exercise that comes with it. You are given a week to complete these exercises and you will need to demonstrate this to the lab demonstrator in the next laboratory session. Although there is no laboratory exercise for Week 8, you will still need to attend the laboratory to do the demonstration. Each lab exercise is worth 5 marks.

Projects:

The aim of the project is to give the students an opportunity to do a small research and development project in IoT. The project work is to be performed in teams of up to 4 students.

The *modus operandi* is:

- A list of projects will be made available in Week 1 of the course.
- Students can form teams to bid to do one of these projects or propose their own. Future details on this will be available when the list of project is posted.
- Project teams and topics must be finalised by Week 3.
- Each project team should submit their preliminary research finding and proposed project plan in a preliminary report in Week 5. The proposed project plan must include the milestones to be achieved by Week 8 and final deliverables. The LiC reserves the right to add or remove tasks from the proposed project.
- Each project team is to present their preliminary research finding to the class during the lecture in Week 5.
- Each project team to present their intermediate finding (demonstrating milestones achieved as per preliminary plan) in Week 8.
- The final project report and code is to be submitted by 17:00 Sunday 24 Nov 2019 via give.
- A final demonstration and interview will be held in Week 11.

Note that there is no formal examination for COMP6733.

Course Evaluation and Development

Student feedback on this course, and on the effectiveness of lectures in this course, is obtained via electronic survey at the end of each term. Student feedback is taken seriously, and continual improvements are made to the course based in part on this feedback. Students are strongly encouraged to let the lecturer in charge know of any problems as soon as they arise. Suggestions and criticisms will be listened to openly, and every action will be taken to correct any issue or improve the students' learning experience.

Special Consideration

You can view the Special Consideration policy at the link here (https://student.unsw.edu.au/special-consideration) (https://student.unsw.edu.au/special-consideration) (https://student.unsw.edu.au/special-consideration)

UNSW handles special centrally (in the Student Lifecycle division), so all special must be submitted via the UNSW Special Consideration (https://iaro.online.unsw.edu.au/special_consideration/home.login) website. If your work in this course is affected by unforeseen adverse circumstances, you should apply for Special Consideration. Special must be accompanied by documentation on how you have been affected, which will be verified by Student Lifecycle. Do not email the course directly about special consideration. If your request is reasonable and your work has clearly been impacted, then

- a lab, you may be granted an extension
- problem set, you may be granted an extension
- a project report, you may be granted an extension

Note the use of the word "may". None of the above is guaranteed. It depends on you making a convincing case that the circumstances have clearly impacted your ability to work. Note that UNSW expects you to be available to sit Supplementary Exams, if required. If you are awarded a supplementary exam and do not attend, then your exam mark will be zero.

If you are registered with Disability Services, please forward your documentation to your Lecturer within the first two weeks of term.

Contacting LiC and Course Admin: No personal emails please.

Safe Return to Campus

- https://www.covid-19.unsw.edu.au/safe-return-campu... (https://www.covid-19.unsw.edu.au/safe-return-campus-faqs)
- https://edtech.eng.unsw.edu.au/c19mess/comms.html (https://edtech.eng.unsw.edu.au/c19mess/comms.html)

9 months ago , last modified 8 months ago .

Resource created 11 months ago (Thursday 30 July 2020, 04:07:26 PM), last modified 12 minutes ago (Friday 25 June 2021, 11:17:24 AM).

Comments

(/COMP6733/20T3/forums/search?forum_choice=resource/49976) (/COMP6733/20T3/forums/resource/49976)

There are no comments yet.