UNSW Course Outline

COMP4336 Mobile Data Networking - 2024

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General Course Information

Course Code : COMP4336
Year : 2024
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

This is a first course in wireless and mobile networking examining the fundamental theories as well as the latest advances in wireless data and mobile communication networks. Topics include fundamental concepts in wireless coding, modulation, and signal propagation, WiFi and wireless

local area networks, cellular networks, Bluetooth, and Internet of Things networks. The course will also overview some of the emerging wireless networking concepts, such as wireless sensing, and droneassisted mobile networks. Hands-on experiments with mobile devices will be part of the learning exercise, which involves wireless packet capture, analysis, and programming.

Course Aims

The course aims to produce who are expert in the area of wireless network technologies and can contribute to solutions in this space.

The course is a discipline elective in the Computer Networks major in the undergraduate computer science program and in the Internetworking majors in the masters program.

Relationship to Other Courses

COMP3331/9331 or any other introductory networking courses would be assumed pre-requisite knowledge. Knowledge of MATLAB would be useful for some of the hands-on laboratory tasks.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : master the fundamental theories and the basic science and mathematics behind popular wireless networking technologies
CLO2 : analyse the algorithms and protocols used by popular wireless and mobile networking technologies
CLO3 : gain insight to some of the emerging wireless and mobile networking concepts and technologies
CLO4 : experiment with mobile devices

Course Learning Outcomes	Assessment Item
CLO1 : master the fundamental theories and the basic science and mathematics behind popular wireless networking technologies	• Final Exam • Mid-lecture Quizzes
CLO2 : analyse the algorithms and protocols used by popular wireless and mobile networking technologies	• Final Exam • Mid-lecture Quizzes
CLO3 : gain insight to some of the emerging wireless and mobile networking concepts and technologies	• Final Exam • Mid-lecture Quizzes
CLO4 : experiment with mobile devices	• Hands-on Experiments (Labs) • Term Project

Learning and Teaching Technologies

Moodle - Learning Management System | EdStem | Echo 360 | Blackboard Collaborate

Additional Course Information

Most labs will be conducted on-campus as the students can get the best help from the tutors while interacting face-to-face. The number of on-line labs will be limited from now on as we transition to fully face-to-face teaching.

Students are advised to ensure that the three-hour lecture period remains unobstructed by any conflicting commitments.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Final Exam Assessment Format: Individual	40%	Start Date: End of term exam period Due Date: End of term exam period
Hands-on Experiments (Labs) Assessment Format: Individual	20%	Start Date: Weekly Due Date: Weekly
Mid-lecture Quizzes Assessment Format: Individual	15%	Start Date: Weekly Due Date: Weekly
Term Project Assessment Format: Individual	25%	Due Date: Week 9: 04 November - 10 November

Assessment Details

Final Exam

Assessment Overview

A 2-hour exam on the Inspera system during the UNSW Exam Period. It will be a mix of multiple-choice and written-answer questions.

Course Learning Outcomes

- CLO1 : master the fundamental theories and the basic science and mathematics behind popular wireless networking technologies
- CLO2 : analyse the algorithms and protocols used by popular wireless and mobile networking technologies
- CLO3 : gain insight to some of the emerging wireless and mobile networking concepts and technologies

Detailed Assessment Description

The exam will be open book but expected to be invigilated.

Assignment submission Turnitin type

This is not a Turnitin assignment

Hurdle rules

Students must attempt the final exam and score at least 40% (16 out of 40) to be eligible to pass the course. To successfully pass the course, students must achieve at least 40% in the final exam and a combined overall grade of 50% across all assessment components.

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Hands-on Experiments (Labs)

Assessment Overview

Labs are designed for students to gain deeper understanding of the concepts taught in the lectures through hands-on experiments. These labs can be completed using your personal mobile devices, such as your laptop and mobile phones.

Labs are marked and feedback is provided by the lab demonstrators.

Course Learning Outcomes

- CLO4 : experiment with mobile devices

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described

below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or media, you may be asked to account for your work. 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.
For more information on Generative AI and permitted use please see here.

Mid-lecture Quizzes

Assessment Overview

9 weekly quizzes [best 6 will be counted]. Quizzes are online and will be automatically marked.

Course Learning Outcomes

- CLO1 : master the fundamental theories and the basic science and mathematics behind popular wireless networking technologies
- CLO2 : analyse the algorithms and protocols used by popular wireless and mobile networking technologies
- CLO3 : gain insight to some of the emerging wireless and mobile networking concepts and technologies

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Term Project

Assessment Overview

This project involves experimentation with and analysis of a WiFi system and development of software to modify the functionality of the system.

It is marked by the tutors against a rubric given in the assignment description.

Course Learning Outcomes

- CLO4 : experiment with mobile devices

Detailed Assessment Description

This year, the project may involve WiFi, Bluetooth, or other networking technologies.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
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General Assessment Information

Grading Basis

Standard

Requirements to pass course

Students must attempt the final exam and score at least 40% (16 out of 40) to be eligible to pass the course. To successfully pass the course, students must achieve at least 40% in the final exam and a combined overall grade of 50% across all assessment components.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Other	Wireless fundamentals I, Complete Lab-1
Week 2 : 16 September - 22 September	Other	Wireless Fundamentals II, Mid-lecture Quiz, Complete Lab-2
Week 3 : 23 September - 29 September	Other	WiFi I, Mid-lecture Quiz, Complete Lab-3
Week 4 : 30 September - 6 October	Other	WiFi II, Mid-lecture Quiz, Complete Lab-4
Week 5 : 7 October - 13 October	Other	Public Holiday (No lecture or lab sesions, but Bluetooth lecture video released and affected labs, i.e. Lab 5, rescheduled)
Week 7 : 21 October - 27 October	Other	Cellular Networks, Mid-lecture Quiz, Complete Lab-6
Week 8 : 28 October - 3 November	Other	Internet of Things Networks, Mid-lecture Quiz, Complete Lab-7
Week 9 : 4 November - 10 November	Other	Wireless Sensing, Mid-lecture Quiz, Complete Lab-8
Week 10 : 11 November - 17 November	Other	Non-terrestrial Networks, Mid-lecture Quiz, Complete Lab-9

Attendance Requirements

CSE Attendance Guidelines :

Students are expected to be regular and punctual in attendance at all classes for the Computer Science and Engineering courses in which they are enrolled. For lab classes and tutorials, in particular, this provides the opportunity to get assistance from the demonstrator/tutor. Students who do not attend classes regularly run the risk of failing a course.

Consistent and timely attendance is a fundamental expectation for both lectures and lab/tutorial sessions within this course. Given that mid-lecture quizzes play a role in shaping the course assessments, students are strongly encouraged to safeguard the uninterrupted three-hour lecture window from potential schedule conflicts. The lab and tutorial classes offer a chance to receive guidance from the demonstrator/tutor, ensuring the successful completion of the assessed lab experiments. As a result, students who do not maintain regular attendance put themselves at jeopardy of not succeeding in the course.

General Schedule Information

Here is a tentative schedule, which may be subject to minor adjustments during the term.

Week 1: Wireless fundamentals I, Complete Lab-1

Week 2: Wireless Fundamentals II, Mid-lecture Quiz, Complete Lab-2

Week 3: WiFi I, Mid-lecture Quiz, Complete Lab-3

Week 4: WiFi II, Mid-lecture Quiz, Complete Lab-4

Week 5: **Public Holiday (No lecture or lab sesions**, but Bluetooth lecture video released and affected labs, i.e. Lab 5, rescheduled)

Week 6: **Term Recess (No lecture, no lab)**

Week 7: Cellular Networks, Mid-lecture Quiz, Complete Lab-6

Week 8: Internet of Things Networks, Mid-lecture Quiz, Complete Lab-7

Week 9: Wireless Sensing, Mid-lecture Quiz, Complete Lab-8

Week 10: Non-terrestrial Networks, Mid-lecture Quiz, Complete Lab-9

Course Resources

Prescribed Resources

The following textbook will be used to supplement the pre-recorded lecture vides for flip-classroom preparations:

Wireless and Mobile Networking, CRC Press, 2022, M. Hassan.

Print:

https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780367487355

Digital:

https://unswbookshop.vitalsource.com/products/-v9781000642803

Recommended Resources

Wireless communications, 2nd Ed, Prentice Hall, 2002, Theodore S. Rappaport.

Additional on-line resources may be recommended during the lectures.

Additional Costs

Depending on their existing laptop and mobile phones, the students may be required to secure addtional nominal equipment costing no more than $30-50 for laboratory experiments and term

project.

Course Evaluation and Development

Student feedback will be collected through MyExperience at the end of the session, and it's taken seriously to make ongoing improvements to the course. In the last offering in T3, 2023, the main comments highlighted the need for a more efficient discussion forum beyond standard Moodle forums, consistent study materials, and effective lab experiments across various laptop and mobile platforms. In response, we're transitioning to Ed for discussions, using a comprehensive recent textbook for lectures, and providing additional equipment solutions for diverse devices to run lab experiments. These adjustments are aimed at enhancing the learning experience for studets in 2024.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Mahbub Ha ssan		K17-607		Mondays 2pm-3pm student consultations at K17-607	Yes	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 rule, which means that if you sit an exam, 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.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: https://www.unsw.edu.au/engineering/student-life/student-resources/program-design.

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.