COMP8250

Advanced Topics in Computer Networks

Session 1, In person-scheduled-weekday, North Ryde 2023

School of Computing

Contents

General Information

Unit convenor and teaching staff
Unit Convenor and Lecturer
Dr. Adnan Mahmood
adnan.mahmood@mq.edu.au
Contact via 9850 9079
Room 286, 4 Research Park Drive
Consultation : By Appointment

Practical Demonstrator
Mr. Linfeng Liang
linfeng.liang@mq.edu.au
Contact via Email
Level 3, 4 Research Park Drive
Consultation : TBD

Rajan Shankaran
rajan.shankaran@mq.edu.au

Credit points
10

Prerequisites
ITEC647 or COMP6250

Corequisites

Co-badged status
COMP7250

Unit description
This unit aims to address various advanced aspects of networking, particularly the current and emerging research topics in network. The focus will be on material drawn from the recent research literature. Topics include but are not limited to label switching, VPN architectures, Inter-domain routing, advanced multicast routing models, traffic engineering, congestion control, quality of service, and multimedia networks. The unit consists of lecture, reading, discussion and assignment components.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Demonstrate working knowledge of the key networking technologies and their interaction.

ULO2: Analyse and Design Internet Routing Architectures and demonstrate working knowledge of emerging routing paradigms through peering for large loosely connected networks.

ULO3: Design simulation and experiments to demonstrate the working of network technologies and algorithms.

ULO4: Collaborate and communicate with others in a professional setting in both written and oral form.

ULO5: Conduct professional work ethically with a high level of integrity, autonomy, and accountability.

General Assessment Information

Requirements to Pass this Unit

To pass this Unit, you must achieve a total mark equal to or greater than 50%. Please note that there are no hurdles in this Unit.

Late Assessment Submission Penalty

Unless a Special Consideration Request has been submitted and approved, a 5% penalty (of the total possible mark of the Assessment) would be applied for each day a Written Assessment is not submitted, i.e., up until the 7th day (including the weekends). Subsequent to the 7th day, a grade of '0' would be awarded even if the Assessment is submitted. The submission time for all uploaded Assessments is 11:55 PM. A 1-hour grace period would be provided to students who experience a technical concern.

For any late submission of the time-sensitive tasks, such as scheduled Presentation and Final Examination, please apply for Special Consideration.

Assessments where late submissions would be accepted:

• Assignment 1 : Yes, Standard Late Penalty applies
• Assignment 2 : Yes, Standard Late Penalty applies

Special Consideration

The Special Consideration Policy aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable, and significantly disruptive, and which may affect their performance in an Assessment. If you experience circumstances or events that affect your ability to complete the Assessments in this Unit on time, please inform the

Convenor and submit a Special Consideration Request through ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	20%	No	Week 7
Assignment 2	40%	No	Reports Due – Week 11, Presentations – Week 12
Final Examination	40%	No	Exam Period

Assignment 1

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 20 hours
Due: **Week 7**
Weighting: **20%**

The purpose of the problem solving assignment is to help the students to get accustomed to dealing with real world problem situations/issues.It is designed to help students analyse a particular problem and find its best solution. Some questions may require an in depth research and will be a process to come up with an acceptable and reasonable answer

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Assignment 2

Assessment Type [1]: Project
Indicative Time on Task [2]: 40 hours
Due: **Reports Due – Week 11, Presentations – Week 12**
Weighting: **40%**

Assignment 2 - Group Project will apply to all material taught in this course. Students will leverage their knowledge of mobile networks to research and critically analyse relevant literature in the discipline and present conclusions. The assessment also allows students to further develop their team working and professional communication skills.

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- Design simulation and experiments to demonstrate the working of network technologies and algorithms.
- Collaborate and communicate with others in a professional setting in both written and oral form.
- Conduct professional work ethically with a high level of integrity, autonomy, and accountability.

Final Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **Exam Period**
Weighting: **40%**

Written exam.

On successful completion you will be able to:
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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Lectures

A 2 hour Lecture would be delivered each week on campus. Students are highly encouraged to ask questions from the Lecturer(s) in a bid to clarify anything they might not be sure of. Students are also encouraged to engage in active discussion via the General Discussion Forum on iLearn.

Lecture Notes (Slide Decks) would be made available, however, they are not a substitute of the recommended Readings. Please note that Digital Recordings of the Lectures would be available via the Macquarie University's Echo360 Active Learning Platform.

Practicals

The purpose of Practicals is to reinforce the concepts that are covered in the Lectures. Practicals provide students an opportunity to practice their Networking Skills under the supervision of a Demonstrator. Each week, students would be given a number of problems to work on. It is important to keep up with these problems as doing so would help students understand the content of the Unit and prepare for the Assignments.

It is pertinent to mention that while Practicals are structured vis-à-vis the Lectures' content, there would not always be a one-to-one mapping between them. This is because students need some Practical Sessions to get acquainted to new tools and devices, thereby limiting the number of time slots available to experiment with technologies discussed in some Lectures.

There will be a 2 hour Practical Session each week which is conducted in a Specialized Networking Laboratory. Kindly note that there is no opportunity to conduct / practice Practicals outside the assigned Sessions.

Note: Practicals commence in Week 2.

Assignments

Assignments would be made available on iLearn and would submitted online via Turnitin.

Recommended Text

It should be noted that no single Textbook addresses all Topics of this Unit. Accordingly, a large proportion of the Lecture Notes are drawn from the Research Papers, White Papers, and Standards' Documents. Students are, therefore, encouraged to read the recommended Reading List to gain a solid understanding of the Topics. Nevertheless, some suggested Books include:

Computer Networks and Internets, Global Edition, Sixth Edition (Author : Douglas E. Comer)

Computer Networking : A Top-Down Approach, Global Edition, Eight Edition (Authors : James F. Kurose and Keith W. Ross)

Internetworking with TCP / IP : Principles, Protocols, and Architecture – Volume 1, Sixth Edition (Author : Douglas E. Comer)

Methods of Communication

We will communicate with you via your Macquarie University's Email or through Announcements on iLearn. Queries to Convenor can either be placed on the iLearn Discussion Board or sent to adnan.mahmood@mq.edu.au from your University Email Address.

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie University's website, https://www.mq.edu.au/about/coronavirus-faqs. Remember to check this page regularly in case the information and requirements change during the Semester. If there are any changes to this Unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

Week #	Lecture / Activity	Assessment Task
Week 1	Unit Introduction, Classless Inter Domain Routing	
Week 2	Internet Routing Architectures	
Week 3	Border Gateway Protocol – Part I	
Week 4	Border Gateway Protocol – Part II	
Week 5	IP Multicast	
Week 6	Multiprotocol Label Switching	
Week 7	Virtual Private Networks	Assignment 1 – Due
Mid Semester Break / Recess (April 10, 2023 – April 21, 2023)		
Week 8	Software Defined Networking	
Week 9	Network Security – Part I	
Week 10	Network Security – Part II, Satellite Networks	
Week 11	The Future of Networking	Assignment 2 – Due

Week 12	Group Presentations	
Week 13	Revision	

Note: Final Examination would be held during the S1 2023's Examination Period (June 5, 2023 – June 23, 2023).

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing an

d maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

- Adjusted the Unit Schedule to slightly alter the order of Lectures' Topics; and
- Lecture entitled, The Future of Networking, has been incorporated in Week 11.