Course Outline

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Course Details

Course Code	COMP9332
Course Title	Network Routing and Switching
Convenor	Salil Kanhere (/users/z3116703)
Admin	Salil Kanhere (/users/z3116703)
Classes	**Lectures** : Tuesdays and Wednesdays from 18:00 - 20:00 online via Microsoft Teams (https://teams.microsoft.com/l/meetup-join/19%3a6e89de3c87974558bd75b6b9fb736883%40thread.tacv2/1590737528383?context=%7b%22Tid%22%3a%223ff6cfa4-e715-48db-b8e1-0867b9f9fba3%22%2c%22Oid%22%3a%2279da0ced-9316-43b5-9521-71f993bc22f9%22%7d) Timetable for all classes (/COMP9332/20T2/timetable)
Consultations	Wednesdays from 16:30 - 17:30 via Microsoft Teams (https://teams.microsoft.com/l/meetup-join/19%3a6e89de3c87974558bd75b6b9fb736883%40thread.tacv2/1590738952613?context=%7b%22Tid%22%3a%223ff6cfa4-e715-48db-b8e1-0867b9f9fba3%22%2c%22Oid%22%3a%2279da0ced-9316-43b5-9521-71f993bc22f9%22%7d)
Units of Credit	6
Course Website	http://cse.unsw.edu.au/~cs9332/20T2/ (http://cse.unsw.edu.au/~cs9332/20T2/)

Handbook Entry	http://www.handbook.unsw.edu.au/postgraduate/courses/current/COMP9332.html (http://www.handbook.unsw.edu.au/postgraduate/courses/current/COMP9332.html)

Course Summary

This course will focus on the routing and switching architectures, algorithms, and protocols for packet switching networks with an emphasis on the Internet or Internet Protocol (IP) based networks. Routing techniques for both traditional wired networks, and the emerging wireless and mobile networks will be examined. The course will teach the fundamental routing concepts using open standards, such as BGP and OSPF. Configuring vendor specific products is outside the scope of this course.

Assumed Knowledge

Before commencing this course, students should:

- have basic understanding of the TCP/IP networking architecture and protocols
- basic programming knowledge
- experience in using Linux OS

These are assumed to have been acquired in COMP3331/9331 or any other introductory course on computer networks.

Student Learning Outcomes

After completing this course, students will:

1. gain good understanding of the role of routing and switching in modern communication networks
2. master routing architectures, protocols, and algorithms with an emphasis on fundamental concepts and principles
3. learn how to configure, tune, and analyse the performance of popular routing protocols
4. develop abilities to innovate routing solutions for new networking requirements

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, assignment
Scholarship: Capable of independent and collaborative	Labs, assignment
Scholarship: rigorous in their analysis, critique, and reflection	Lectures, labs, exams, sample problems
Scholarship: able to apply their knowledge and skills to solving problems	Labs, assignment, exams, sample problems
Scholarship: capable of effective communication	Labs, assignment, lectures, exams
Scholarship: digitally literate	All aspects of the course
Scholarship: information literate	All aspects of the course
Leadership: collaborative team workers	Labs
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
Global citizens: culturally aware and capable of respecting diversity and acting in socially /responsible ways	Labs, course forum

Teaching Strategies

- **Lectures** : introduce theory and demonstrate how they apply in practice
- **Lab Work** : reinforce concepts taught in lectures by conducting hands-on experiments and network performance
- **Assignments** : allow students to design and implement network evaluate network performance
- **Sample Problems:** allow students to solve problems based on content from lectures, develop problem-solving skills, assist with exam preparation
- **Consultations and Course Forum:** allow students an opportunity to ask questions and seek help.

Teaching Rationale

Learning will be largely facilitated through the delivery of lectures. The hands-on laboratories will provide an opportunity to gain deeper understanding of the concepts discussed in the lectures. The weekly sample problem sets will help in the development of problem-solving skills and in preparing for the exams. The assignment is mainly geared to allow students to gain familiarity with basic network programming and designing network protocols.

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	Due	Weighting	Learning Outcomes	Hurdle
Mid-Term Exam (Online Open-book Moodle Exam)	Wednesday, Week 5 (1st July 2020)	15%	1 and 2	None
Lab Exam (Online exam during lab hours)	Week 9 Lab	10%	4	None
Assignment	Wednesday, Week 10 (5th August 2020)	25%	3	None
Final Exam (Online Open-book Moodle Exam)	Exam Week (TBA)	50%	1, 2 and 4	To pass the course a student MUST receive at least 40% marks in the final exam

The following formula outlines precisely how the final mark will be computed:

```
labExam = mark for lab exam (scaled to 10 marks)
assign = marks for the assignment (scaled to 25 marks)
midTerm = mark for the mid-term exam (scaled to 15 marks)
finalExam =  mark for the final exam (scaled to 50 marks)
mark = labExam + assign + midTerm + finalExam
grade = HD|DN|CR|PS if mark >= 50 && finalExam >= 20
      = FL          if mark < 50
      = UF          finalExam < 20
```

Course Schedule

Week	Lecture Dates	Topics	Labs	Assessment Tasks
1	2nd and 3rd June	Course Intro, IPv4	NO LABS	
2	9th and 10th June	NAT, IPv6	NO LABS	
3	16th and 17th June	RIP	Lab 1 & 2	
4	23rd and 24th June	OSPF and BGP	Lab 3 & 4	
5	30th and 1st July	BGP	Lab 5	Mid-term Exam on 1st July
6	NO LECTURE		NO LABS	
7	14th and 15th July	Software Defined Networks	Lab 6 & 7	
8	21st and 22nd July	AODV, Geographical Routing	Lab 8 & 9	
9	28th and 29th July	Multicasting, Delay Tolerant Networking	Lab Exam	Lab Exam
10	4th and 5th August	VPN, TOR, Recap	NO LABS	Assignment due on 5th August
Exam Week				Final Exam

Resources for Students

There is no prescribed textbook for this course. All required notes and slides will be available on the course webpage. The course may make use of some freely available materials such as IETF RFCs, published articles (journal, magazine, or conference), and industry white papers.

The following books may be useful as additional references:

- TCP/IP Protocol Suite, Behrouz Forouzan, McGraw Hill, 3rd Edition, 2006.
- TCP/IP Tutorial and Technical Overview, Adolf Rodriguez et al, IBM Redbooks (linked in Week 1 notes)
- Software Defined Networks: A Comprehensive Approach,(2nd Edition). P. Goransson, C. Black, and T. Culver, Morgan Kaufmann. 2017.
- Computer Networking: A Top-Down Approach, Jim Kurose and Keith Ross, Pearson, 6th or 7th Edition.
- Internetworking with TCP/IP Principles, Protocols, and Architectures, Fourth Edition, By Douglas Comer, Prentice Hall, 2000

Course Evaluation and Development

This course is evaluated each session using the myExperience system.

In 19T2, 100% of the students agreed that they were satisfied with the quality of the course with a mean value of 5.18 out of 6 in myExperience survey. Based on their comments, we have not made any significant changes to the content or delivery other than to make adjustments for online delivery due to COVID-19.

Special Consideration

You can view the Special Consideration policy at the link here (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

- an assignment, you may be granted an extension
- Mid Term Exam, you may be granted an opportunity to take the exam later
- Final Exam, you may be offered a Supplementary Exam

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 : No personal emails please. Please use cs9332@cse.unsw.edu.au (mailto:<a href=)

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Comments

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There are no comments yet.