

# NWEN302 (2017) - Computer Network Design

## Prescription

This course addresses the principles, architectures and protocols that have shaped the development of the Internet and modern networked applications. It examines network design principles, underlying protocols, technologies and architectures of the TCP/IP protocol stack. Topics include the design of transport protocols, routing protocols, logical link control, medium access control and physical media.

## Course learning objectives

Students who pass this course will be able to:

1. Explain the process in which packets are delivered from source to destination in the Internet (GA 3(b))
2. Explain key routing algorithms, the process of how routing protocols communicate/exchange topology information and set up routing tables (GA 3(a), 3(b), 3(d), 3(e))
3. Explain the operation of the TCP flow and congestion control algorithms (GA 3(a), 3(b), 3(c), 3(d), 3(e))
4. Explain the role of medium access control and implications of different types of physical layers (GA 3(a), 3(b), 3(c), 3(d), 3(e))
5. Setup and interconnect networks with an emulation tool (GA 3(b), 3(d), 3(f))
6. Implement a simple packet sniffer to analyze data packets on the network (GA 3(b), 3(d), 3(f))
7. Implement simple networking algorithms and protocols using TCP/IP primitives (GA 3(b), 3(d), 3(f))
8. Setup and configure a simple network of SDN-enabled devices and demonstrate the usage, comparing it with the traditional Internet model (GA 3(b), 3(d), 3(f)).

## Course content

This document sets out the workload and assessment requirements for NWEN 302. It also provides contact information for staff involved in the course. If the contents of this document are altered during the course, you will be advised of the change by an announcement in lectures and/or on the course web site.

## Withdrawal from Course

Withdrawal dates and process:

<http://www.victoria.ac.nz/students/study/course-additions-withdrawals>

## Lecturers



**Winston Seah (Coordinator)**

winston.seah@vuw.ac.nz 04 4635233 ext 8493

416 Alan MacDiarmid Building, Kelburn



**Bryan Ng**

bryan.ng@vuw.ac.nz

04 4639998

410 Alan MacDiarmid Building, Kelburn

## Teaching Format

During the trimester there will be three lectures per week. Students are encouraged to approach the lecturers if they have questions; students can also discuss with tutors if they have questions on the assignments/labs.

## Dates (trimester, teaching & break dates)

- Teaching: 17 July 2017 - 20 October 2017
- Break: 28 August 2017 - 08 September 2017
- Study period: 24 October 2017 - 26 October 2017
- Exam period: 27 October 2017 - 18 November 2017

## Class Times and Room Numbers

### 17 July 2017 - 27 August 2017

- **Tuesday** 14:10 - 15:00 – LT101, Murphy, Kelburn
- **Thursday** 14:10 - 15:00 – LT101, Murphy, Kelburn
- **Friday** 14:10 - 15:00 – LT101, Murphy, Kelburn

### 11 September 2017 - 22 October 2017

- **Tuesday** 14:10 - 15:00 – LT101, Murphy, Kelburn
- **Thursday** 14:10 - 15:00 – LT101, Murphy, Kelburn
- **Friday** 14:10 - 15:00 – LT101, Murphy, Kelburn

## Set Texts and Recommended Readings

### Required

There are no required texts for this offering.

## Mandatory Course Requirements

In addition to achieving an overall pass mark of at least 50%, students must:

- Attempt all labs and obtain at least 40% of the total available marks across all the labs;
- Obtain a C- grade or better in the final exam.

*If you believe that exceptional circumstances may prevent you from meeting the mandatory course requirements, contact the Course Coordinator for advice as soon as possible.*

## Assessment

This course will be internally and externally assessed through assignments, labs and a final examination.

## Workload

In order to maintain satisfactory progress in NWEN 302, you should plan to spend at least 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures: 3 hours
- Readings: 2 hours
- Assignments: 2 hours
- Labs: 3-4 hours

## Teaching Plan

### Links to General Course Information

- Academic Integrity and Plagiarism: <http://www.victoria.ac.nz/students/study/exams/integrity-plagiarism>
- Academic Progress: <http://www.victoria.ac.nz/students/study/progress/academic-progress> (including restrictions and non-engagement)
- Dates and deadlines: <http://www.victoria.ac.nz/students/study/dates>
- Grades: <http://www.victoria.ac.nz/students/study/progress/grades>
- Special passes: Refer to the Assessment Handbook, at <http://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>
- Statutes and policies, e.g. Student Conduct Statute: <http://www.victoria.ac.nz/about/governance/strategy>
- Student support: <http://www.victoria.ac.nz/students/support>
- Students with disabilities: [http://www.victoria.ac.nz/st\\_services/disability/](http://www.victoria.ac.nz/st_services/disability/)
- Student Charter: <http://www.victoria.ac.nz/learning-teaching/learning-partnerships/student-charter>
- Terms and Conditions: <http://www.victoria.ac.nz/study/apply-enrol/terms-conditions/student-contract>
- Turnitin: <http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin>
- University structure: <http://www.victoria.ac.nz/about/governance/structure>
- VUWSA: <http://www.vuwsa.org.nz>

**Offering CRN:** [17181](#)

**Points:** 15

**Prerequisites:** NWEN 241, 243; ENGR 123 or (MATH 161, one of MATH 177, QUAN 102 or STAT 193)

**Duration:** 17 July 2017 - 19 November 2017

**Starts:** Trimester 2

**Campus:** Kelburn