



## 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 simple networking algorithms and protocols using TCP/IP primitives (GA 3(b), 3(d), 3(f))
7. 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)).

## Required Academic Background

Students must have basic networking protocols knowledge (cf: NWEN 243) and be able to program in C and Python (cf: NWEN 241).

## Withdrawal from Course

Withdrawal dates and process:

<https://www.wgtn.ac.nz/students/study/course-additions-withdrawals>

## Lecturers

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**Alvin Valera (Coordinator)**

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401 Alan MacDiarmid Building, Kelburn

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# Winston Seah

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416 Alan MacDiarmid Building, Kelburn

## Teaching Format

During the trimester there will be two in-person 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.

## Student feedback

A summary of the course feedback provided by students previously for this course is available from: [http://www.cad.vuw.ac.nz/feedback/feedback\\_display.php](http://www.cad.vuw.ac.nz/feedback/feedback_display.php)

## Dates (trimester, teaching & break dates)

- Teaching: 13 July 2020 - 18 October 2020
- Break: 17 August 2020 - 30 August 2020
- Exam period: 19 October 2020 - 25 October 2020

## Class Times and Room Numbers

### 13 July 2020 - 16 August 2020

- **Tuesday** 11:00 - 11:50 – 104, Te Toki a Rata, Kelburn
- **Wednesday** 11:00 - 11:50 – 104, Te Toki a Rata, Kelburn
- **Friday** 11:00 - 11:50 – 104, Te Toki a Rata, Kelburn

### 31 August 2020 - 18 October 2020

- **Tuesday** 11:00 - 11:50 – 104, Te Toki a Rata, Kelburn
- **Wednesday** 11:00 - 11:50 – 104, Te Toki a Rata, Kelburn
- **Friday** 11:00 - 11:50 – 104, Te Toki a Rata, Kelburn

## Other Classes

There will be weekly 1.5-hour in-person helpdesks in CO246 reserved for NWEN 302 labs. There will also be weekly 1-hour online helpdesks through Zoom.

## 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 an average of **C-** grade or better in the term tests.

*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 assessed through assignments, labs and a final examination.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Assignment 1	Week 4	CLO: 1,2,3,4	2.5%
Assignment 2	Week 7	CLO: 1,2,3,4	2.5%
Assignment 3	Week 9	CLO: 1,2,3,4	2.5%
Assignment 4	Week 12	CLO: 1,2,3,4	2.5%
Lab 1	Week 5, Week 6	CLO: 5,6,7	20%
Lab 2	Week 9, Week 10	CLO: 5,6,7	20%
Lab 3	Week 12	CLO: 5,6,7	20%
Term Test 1 (Take-Home)	Week 7	CLO: 1,2,3,4	15%
Term Test 2 (Take-Home)	Assessment Period	CLO: 1,2,3,4	15%

## Penalties

Term test submitted after the deadline will not be marked and will get 0 marks.

Assignments and labs submitted after the deadline will be deducted 20% of the marks per day late (00:00 the following day is counted as one day late).

## Extensions

Any request for extension must be supported by a medical certificate or other acceptable documentation for non medical reasons. Medical certificates must be provided by a registered medical practitioner.

**Approval for extensions can only be granted by the course lecturers.**

## Submission & Return

Term tests are to be submitted electronically (in PDF format) via the ECS submission system and are due at 12:00 on the specified date.

All assignments and lab reports (and supplementary documents, e.g. source codes) are to be submitted electronically via the ECS submission system and are due at 23:59 on the date specified.

## Workload

In order to maintain satisfactory progress in NWEN 302, you should plan to spend an average of 10 - 11 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

See [https://ecs.wgtn.ac.nz/Courses/NWEN302\\_2020T2/LectureSchedule](https://ecs.wgtn.ac.nz/Courses/NWEN302_2020T2/LectureSchedule)

## Communication of Additional Information

Please refer to the ECS Wiki Page at [https://ecs.wgtn.ac.nz/Courses/NWEN302\\_2020T2/](https://ecs.wgtn.ac.nz/Courses/NWEN302_2020T2/) for the latest information related to the course.

## Links to General Course Information

- Academic Integrity and Plagiarism: <https://www.wgtn.ac.nz/students/study/exams/integrity-plagiarism>
- Academic Progress: <https://www.wgtn.ac.nz/students/study/progress/academic-progress> (including restrictions and non-engagement)
- Dates and deadlines: <https://www.wgtn.ac.nz/students/study/dates>
- Grades: <https://www.wgtn.ac.nz/students/study/progress/grades>
- Special passes: Refer to the Assessment Handbook, at <https://www.wgtn.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>
- Statutes and policies, e.g. Student Conduct Statute: <https://www.wgtn.ac.nz/about/governance/strategy>
- Student support: <https://www.wgtn.ac.nz/students/support>
- Students with disabilities: [https://www.wgtn.ac.nz/st\\_services/disability/](https://www.wgtn.ac.nz/st_services/disability/)
- Student Charter: <https://www.wgtn.ac.nz/learning-teaching/learning-partnerships/student-charter>
- Terms and Conditions: <https://www.wgtn.ac.nz/study/apply-enrol/terms-conditions/student-contract>
- Turnitin: <http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin>
- University structure: <https://www.wgtn.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:** 13 July 2020 - 25 October 2020

**Starts:** Trimester 2

**Campus:** Kelburn