



## Prescription

Simulation and modelling of stochastic systems, covering examples from Operations Research and Computer Science, including queues, networks and computer systems. Design, analysis and validation of simulation experiments. Previous experience with computer programming is required before starting this course.

## Course learning objectives

Students who pass this course should be able to:

1. Use an appropriate queue or queueing network to model a given service facility or congestion situation.
2. Build simulation models of practical networks and systems.
3. Design, analyse and validate simulation experiments.
4. Evaluate and optimise performance characteristics of queues and queueing networks.

## Course content

Simulation topics from:

- Discrete-event computer simulation
- The SimPy simulation language
- Simulation model structures
- Simulation experiments and analysing simulation output

Stochastic Models topics from:

- The Poisson process, the Erlang, Coxian, and Phase-type distributions
- Little's Law for queue models
- Steady-state solution and performance measures of  $M/M/1$  queue
- Queues of different types: multi- and infinite-server, finite capacity
- Numerical solutions for steady-state Markovian queues
- $M/G/1$  queues: the Pollaczek-Khintchine formula
- Jackson-type queue networks
- Closed queue networks: the MVA method of solution

## Withdrawal from Course

Withdrawal dates and process:

## Lecturers

**Stefanka Chukova (Coordinator)**

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535 Cotton, Kelburn

## Teaching Format

## Student feedback

Student feedback on University courses may be found at:  
[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: 22 February 2021 - 28 May 2021
- Break: 05 April 2021 - 18 April 2021
- Study period: 31 May 2021 - 03 June 2021
- Exam period: 04 June 2021 - 19 June 2021

## Class Times and Room Numbers

### 22 February 2021 - 04 April 2021

- **Monday** 15:10 - 16:00 – LT220, Murphy, Kelburn
- **Wednesday** 15:10 - 16:00 – LT220, Murphy, Kelburn
- **Thursday** 15:10 - 16:00 – LT220, Murphy, Kelburn
- **Friday** 15:10 - 16:00 – LT220, Murphy, Kelburn

### 19 April 2021 - 30 May 2021

- **Monday** 15:10 - 16:00 – LT220, Murphy, Kelburn
- **Wednesday** 15:10 - 16:00 – LT220, Murphy, Kelburn
- **Thursday** 15:10 - 16:00 – LT220, Murphy, Kelburn
- **Friday** 15:10 - 16:00 – LT220, Murphy, Kelburn

## Set Texts and Recommended Readings

### Required

There are no required texts for this offering.

## Mandatory Course Requirements

*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

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
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## Penalties

The team project must be completed and a satisfactory level of attainment gained, i.e., achieving mark of at least 50%.

Late or missing assignments or quizzes will receive a mark of zero, because model answers are given out, unless illness, bereavement or other substantial causes occur and have been discussed with the course coordinator and proper documentation (e.g. a medical certificate) has been provided.

## Workload

## Teaching Plan

## Communication of Additional Information

All online material for this course can be accessed at [https://ecs.wgtn.ac.nz/Courses/COMP312\\_2021T1](https://ecs.wgtn.ac.nz/Courses/COMP312_2021T1)

## 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:** [10444](#)

**Points:** 15

**Prerequisites:** one course from (COMP 102, 112, 132, DATA 202); one course from (ENGR 123, MATH 177, 277, STAT 292), 15 further 200-level COMP, DATA, MATH, NWEN, STAT or SWEN pts;

**Restrictions:** OPRE 354;

**Duration:** 22 February 2021 - 20 June 2021

**Starts:** Trimester 1

**Campus:** Kelburn