



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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Teaching Format

Student feedback

Student feedback on University courses may be found at:
www.cad.vuw.ac.nz/feedback/feedback_display.php

Dates (trimester, teaching & break dates)

- Teaching: 02 March 2020 - 07 June 2020
- Break: 13 April 2020 - 27 April 2020
- Study period: 08 June 2020 - 11 June 2020
- Exam period: 12 June 2020 - 27 June 2020

Class Times and Room Numbers

02 March 2020 - 22 March 2020

- **Tuesday** 15:10 - 16:00 – LT206, Easterfield, Kelburn
- **Wednesday** 15:10 - 16:00 – LT118, Laby, Kelburn
- **Thursday** 15:10 - 16:00 – LT206, Easterfield, Kelburn
- **Friday** 15:10 - 16:00 – LT206, Easterfield, Kelburn

27 April 2020 - 07 June 2020

- **Tuesday** 15:10 - 16:00 – LT206, Easterfield, Kelburn
- **Wednesday** 15:10 - 16:00 – LT118, Laby, Kelburn
- **Thursday** 15:10 - 16:00 – LT206, Easterfield, Kelburn
- **Friday** 15:10 - 16:00 – LT206, Easterfield, 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.victoria.ac.nz/Courses/COMP312_2020T1

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/
- 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: 02 March 2020 - 28 June 2020

Starts: Trimester 1

Campus: Kelburn