



Prescription

This course is concerned with the development of correct software, especially the use of formal requirements and specifications to develop high-integrity software. This has applications in several areas, such as safety-critical systems (e.g. commercial airliners, space systems, etc) and high-performance concurrent systems. The course will examine a range of principles and techniques which underpin a rigorous approach to the specification and implementation of software. A sequence of assignments and labs will see a range of tools being used to specify small software systems, and to check that they meet their requirements. NB: this course is first running in 2019.

Course learning objectives

Students who pass this course will be able to:

1. Explain what it means for a system to be correct, what engineering techniques we can use to increase confidence in correctness, and why this is important.
2. Use formal structures such as sets, functions, relations and sequences to model software systems.
3. Use formal notations to specify desired properties of software systems, such as assertions, pre and postconditions, variants, and invariants.
4. Use formal tools to check that systems correctly implement their desired properties.
5. Use formal reasoning to explain why a particular system is correct with respect to a specification.

Course content

The course is primarily offered in-person, but there will also be a remote option and there will be online alternatives for all the components of the course for students who cannot attend in-person.

Students taking this course remotely must have access to a computer with camera and microphone and a reliable high speed internet connection that will support real-time video plus audio connections and screen sharing. Students must be able to use Zoom; other communication applications may also be used. A mobile phone connection only is not considered sufficient. The computer must be adequate to support the programming required by the course: almost any modern windows, macintosh, or unix laptop or desktop computer will be sufficient, but an Android or IOS tablet will not.

The assessment of the course does not include tests, but the assignments must be completed individually.

Withdrawal from Course

Withdrawal dates and process:

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

Lecturers

James Noble (Coordinator)

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234 Cotton, Kelburn

David Streader

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Teaching Format

SWEN324 will have a one week break in week 9, 19-27 September 2020. There will be no lectures or assessment items due during this week.

This course will be offered in-person and online. For students in Wellington, there will be a combination of in-person components and web/internet based resources. It will also be possible to take the course entirely online for those who cannot attend on campus, with all the components provided in-person also made available online.

Student feedback

SWEN324 welcomes student feedback. The responses to feedback may be found at: https://ecs.wgtn.ac.nz/Courses/SWEN324_2021T2/StudentFeedback

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

Dates (trimester, teaching & break dates)

- Teaching: 05 July 2021 - 08 October 2021
- Break: 16 August 2021 - 29 August 2021
- Study period: 11 October 2021 - 14 October 2021
- Exam period: 15 October 2021 - 06 November 2021

Class Times and Room Numbers

05 July 2021 - 15 August 2021

- **Tuesday** 12:00 - 12:50 – LT206, Easterfield, Kelburn
- **Thursday** 12:00 - 12:50 – LT206, Easterfield, Kelburn

30 August 2021 - 10 October 2021

- **Tuesday** 12:00 - 12:50 – LT206, Easterfield, Kelburn
- **Thursday** 12:00 - 12:50 – LT206, Easterfield, Kelburn

Other Classes

All course materials will be available on-line (such as readings or videos or recordings). Class lectures will discuss and explain that content, and will also be recorded.

Set Texts and Recommended Readings

Required

The course will use the textbook *Program Proofs*, K. Rustan M. Leino. KRML256. 24 June 2020.

In 2021 students can access this text free of charge, under the condition that they do not distribute the text further.

Recommended

There are many books available, some online. There are many lecture notes, tutorials, etc online. See the course web site for recommendations.

Mandatory Course Requirements

There are no mandatory course requirements for this course.

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

The four Assignments **must** be completed as **individual work**.
The Weekly Overview Questions may be discussed openly.

Confirmed due dates will be listed on the ECS submission system.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Weekly Overview Questions	Weekly	CLO: 2,3,4	20%
Assignment 1	Week 3	CLO: 1,2,3,4,5	10%
Assignment 2	Week 5	CLO: 1,2,3,4,5	15%
Assignment 3	Week 7	CLO: 1,2,3,4,5	15%
Assignment 4	Assessment period	CLO: 1,2,3,4,5	40%

Penalties

Specific penalties for each item of work will be listed with the requirements for that work item.

Extensions

You will have 6 "slip days" that are managed by the ECS submission system. You do not need to apply for these - any slip days you have left will be automatically applied to assignments that you submit late.

Marks for assessment items submitted more than three slip days late (without an extension) may be delayed, and may be marked pass/fail without feedback.

If you have significant medical or personal issues that may affect your ability to submit an assignment on time, contact the course organiser to discuss an extension. You may need documentation for significant cases.

Submission & Return

All assignments must be submitted via the ECS submission system. Marks and comments will be returned via the ECS marking system.

Marking Criteria

Marking criteria will be provided with each assessment item. Much marking will be automated: you must adhere to assignment requirements to ensure your work can be automatically marked.

Group Work

There is no group work in this course.

Peer Assessment

There is no peer assessment in this course.

Workload

The expected workload for the course is about 10 hours per week. This includes the lectures, tutorial, assignment and reading/study time

Teaching Plan

See https://ecs.wgtn.ac.nz/Courses/SWEN324_2021T2/LectureSchedule

Communication of Additional Information

All information about the course will be available at https://ecs.wgtn.ac.nz/Courses/SWEN324_2021T2

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: [30044](#)

Points: 15

Prerequisites: COMP 103; ENGR 123 or MATH 161; 30 200-level COMP/NWEN/SWEN points;

Restrictions: SWEN 224

Duration: 05 July 2021 - 07 November 2021

Starts: Trimester 2

Campus: Kelburn