



## Prescription

This course addresses the concepts, techniques and tools required for developing computer systems that are applicable where safety and reliability is paramount. Topics include: the concepts and principles underlying safety-critical systems & standards (e.g. DO178C and IEC61508); techniques for design validation (e.g. model checking); and implementation techniques for ensuring software correctness (e.g. coding guidelines, testing, static analysis, etc). Practical work will involve the design, implementation, and analysis of simple safety critical applications (e.g. for industrial, embedded and healthcare systems).

## Course learning objectives

Students who pass this course should be able to:

1. Describe the key principles of safety critical systems and the implications of these for software design and implementation.
2. Select and apply appropriate standards and processes to develop safety critical systems, for example IEC 61508 and DO-178C.
3. Analyse potential risks, hazards, threats, and failure modes in the designs of safety critical systems.
4. Design and construct software following safety critical standards, processes, and design techniques.
5. Evaluate system designs and software against safety critical standards.

## Course content

2022: The course is primarily offered in-person, and there are components such as tests, labs, tutorials, and marking sessions which require in-person attendance. There will be remote alternatives for all the components of the course, but these are only available to students studying from outside the Wellington region. The remote option for tests will use a Zoom-based system for online supervision of the tests.

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.

## Withdrawal from Course

Withdrawal dates and process:

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

## Lecturers

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# David Pearce (Coordinator)

david.pearce@vuw.ac.nz

## Teaching Format

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.

Weekly lectures and individual assignments during whole course. The assignments will build on the material presented in lectures.

## 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: 28 February 2022 - 03 June 2022
- Break: 11 April 2022 - 24 April 2022
- Study period: 06 June 2022 - 09 June 2022
- Exam period: 10 June 2022 - 25 June 2022

## Class Times and Room Numbers

### 28 February 2022 - 10 April 2022

- **Monday** 12:00 - 12:50 – LT122, Cotton, Kelburn
- **Wednesday** 12:00 - 12:50 – LT122, Cotton, Kelburn
- **Friday** 12:00 - 12:50 – LT122, Cotton, Kelburn

### 25 April 2022 - 05 June 2022

- **Monday** 12:00 - 12:50 – LT122, Cotton, Kelburn
- **Wednesday** 12:00 - 12:50 – LT122, Cotton, Kelburn
- **Friday** 12:00 - 12:50 – LT122, Cotton, Kelburn

## Set Texts and Recommended Readings

### Required

There are no required texts for this offering.

## 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

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Assignment 1	28 March	CLO: 1,2,3,4,5	20%
Assignment 2	11 April	CLO: 4,5	10%
Assignment 3	9 May	CLO: 4,5	10%
Assignment 4	23 May	CLO: 4,5	10%
Exam	Held during Assessment Period	CLO: 1,2,3,4,5	50%

## Penalties

Late submissions will incur an automatic penalty of 10% of the final mark per day. Submission between 0 and 24 hours late will be counted as one day late; those between 24 and 48 hours late will be counted as two days late, etc. Any request for an extension must be made to the lecturer in charge *prior* to the due date. Any extensions requested on the basis of medical grounds must be supported by a doctor's certificate.

**LATE DAYS POLICY** (for Assignments). Each student will have three "late days" which you may choose to use for any assignment or assignments during the course. There will be no penalty applied for these late days. You do not need to apply for these, instead any late days you have left will be automatically applied to assignments that you submit late.

## Extensions

Individual extensions will only be granted in exceptional personal circumstances, and should be negotiated with the course coordinator before the deadline whenever possible. Documentation (eg, medical certificate) may be required.

## Submission & Return

All work is submitted through the ECS submission system, accessible through the course web pages. Marks and comments will be returned through the ECS marking system, also available through the course web pages.

## Workload

Although the workload will vary from week to week, you should expect to spend approximately 10 hours per week on the course to give a total of 150 hours study time for the course.

## Teaching Plan

See [https://ecs.wgtn.ac.nz/Courses/SWEN326\\_2022T1/LectureSchedule](https://ecs.wgtn.ac.nz/Courses/SWEN326_2022T1/LectureSchedule)

## Communication of Additional Information

All online material for this course can be accessed at [https://ecs.wgtn.ac.nz/Courses/SWEN326\\_2022T1/](https://ecs.wgtn.ac.nz/Courses/SWEN326_2022T1/)

# 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-enroll/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:** [30042](#)

**Points:** 15

**Prerequisites:** NWEN 241, SWEN 225 (or 222)

**Duration:** 28 February 2022 - 26 June 2022

**Starts:** Trimester 1

**Campus:** Kelburn