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

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 comuputer 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.

If the assessment of the course includes tests, the tests will generally be run in-person on the Kelburn campus. There will be a remote option for students who cannot attend in-person and who have a strong justification (for example, being enrolled from overseas). The remote test option may use the ProctorU system for online supervision of the tests. ProctorU requires installation of monitoring software on your computer which also uses your camera and microphone, and monitors your test-taking in real-time. Students who will need to use the remote test option must contact the course coordinator in the first two weeks to get permission and make arrangements.

Withdrawal from Course

Withdrawal dates and process:
https://www.wgtn.ac.nz/students/study/course-additions-withdrawals

Lecturers

David Pearce (Coordinator)

david.pearce@vuw.ac.nz   04 4635833

231 Cotton, Kelburn

James Quilty

James.Quilty@vuw.ac.nz   04 463 5233 ext 4090

228 Alan MacDiarmid Building, Kelburn

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

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
- **Tuesday** 08:00 - 08:50 – LT102, Maclaurin, Kelburn
- **Thursday** 08:00 - 08:50 – LT102, Maclaurin, Kelburn
- **Friday** 08:00 - 08:50 – LT102, Maclaurin, Kelburn

19 April 2021 - 30 May 2021
- **Tuesday** 08:00 - 08:50 – LT102, Maclaurin, Kelburn
- **Thursday** 08:00 - 08:50 – LT102, Maclaurin, Kelburn
- **Friday** 08:00 - 08:50 – LT102, Maclaurin, 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		CLO: 1,2,3,4,5	20%
Assignment 2		CLO: 4,5	10%
Assignment 3		CLO: 4,5	10%
Assignment 4		CLO: 4,5	10%
Tests 1 & 2		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 betwee 24 and 48 hours late will be counted as two dates 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.

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_2021T1/LectureSchedule

Communication of Additional Information

All online material for this course can be accessed at https://ecs.wgtn.ac.nz/Courses/SWEN326_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-progess (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: 30042

Points: 15
Prerequisites: NWEN 241, SWEN 225 (or 222)
Duration: 22 February 2021 - 20 June 2021
Starts: Trimester 1
Campus: Kelburn