



Prescription

This course presents the principles of robotic and mechatronic design, construction and control. It covers both the theoretical and practical aspects of integrating mechanical, electronic and software components.

Course learning objectives

Students who pass this course should be able to:

1. Interface a variety of sensors and actuators to an embedded processor (BE Graduate Attribute 3(b), 3(f)).
2. Understand and apply mechanical theory and practice in a mechatronic/robotic setting (BE Graduate Attribute 3(a), 3(b), 3(c), 3(f)).
3. Design and implement an integrated robotic system (BE Graduate Attribute 3(a), 3(b), 3(c), 3(d), 3(e), 3(f)).
4. Use a variety of rapid prototyping techniques to develop a proof-of-concept robotic system (BE Graduate Attribute 3(f)).
5. Implement a robotic control system using appropriate machine learning techniques (BE Graduate Attribute 3(a), 3(c), 3(e)).

Course content

This course has critical lab components and is limited to enrolment in-person only. The course cannot be taken online, and in-person attendance at the labs is required.

Required Academic Background

Students should have microcontroller programming experience and an understanding of second year university electronics.

Withdrawal from Course

Withdrawal dates and process:

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

Lecturers

Prof Dale Carnegie (Coordinator)

dale.camegie@vuw.ac.nz 04 463 7485

AM 224 Alan Macdiamid Building, Gate 7, Kelburn Parade, Kelburn

Jim Murphy

jim.murphy@vuw.ac.nz 04 463 9562

FT92 202 92 Fairlie Terrace, Kelburn

Teaching Format

This course is a combination of theoretical material and the practical applications of that material. As such, there is a combination of lectures (two per week), tutorials (approximately one per week) and three-hour laboratory sessions (one per week). These will be delivered over the duration of a normal trimester.

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: 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 – 119, Cotton, Kelburn
- **Wednesday** 12:00 - 12:50 – 119, Cotton, Kelburn
- **Friday** 12:00 - 12:50 – 119, Cotton, Kelburn

25 April 2022 - 05 June 2022

- **Monday** 12:00 - 12:50 – 119, Cotton, Kelburn
- **Wednesday** 12:00 - 12:50 – 119, Cotton, Kelburn
- **Friday** 12:00 - 12:50 – 119, Cotton, Kelburn

Set Texts and Recommended Readings

Required

There are no required texts for this offering.

Mandatory Course Requirements

In addition to achieving an overall pass mark of at least 50%, students must:

- Achieve an average grade of at least 40% over the two tests.
- Achieve at least a **D** for the project.

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

This course will be assessed through formative quizzes, laboratory exercises, two tests, two written assignments and a final practical design and implementation project.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Test 1 (1 hour).	week 8	CLO: 1,2,3	15%
Test 2 (1 hour).	week 12	CLO: 1,2,3	15%
Four formative 10-minute quizzes (worth 1.25% each)	weeks 3, 5, 7, 9	CLO: 1,2,3	5%
Sensor and electronics assignment (10 hours).	week 6	CLO: 1,2,3	15%
Mechanical and robotic assignment (10 hours).	week 11	CLO: 1,2,3	15%
Laboratory exercises (30 hours).	week 10	CLO: 1,3,4,5	15%
Practical Robotic/Mechatronic design and implementation project (20 hours).	week 12	CLO: 1,3,5	20%

Penalties

A 5% penalty per day an assessment item is late will be applied.

Extensions

Requests for extensions should be made directly to the course lecturer responsible for that assessment item. The preferred mechanism is by direct email to either dale.carnegie@vuw.ac.nz or jim.murphy@vuw.ac.nz.

Submission & Return

It is preferred that assessment is either emailed as a pdf directly to the course lecturer responsible for that assessment item either dale.carnegie@vuw.ac.nz or jim.murphy@vuw.ac.nz. Alternatively, hard copies of the assessment may be handed directly to the course lecturer. Due to the small number of students in the course, we will NOT be using the automated submission system.

Normally assessment will be returned within 2 weeks of the hand-in date. However, should there be numerous requests for extensions, or some other mitigating factors, this may be delayed. Students will be informed of any such delays at the earliest opportunity.

Workload

The student workload for this course is 150 hours.

Teaching Plan

Communication of Additional Information

This course uses Blackboard. Course materials and other information will be posted on Blackboard. Students should check Blackboard regularly.

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-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: [34006](#)

Points: 15

Prerequisites: EEEN 201

Restrictions: ECEN 301

Duration: 28 February 2022 - 26 June 2022

Starts: Trimester 1

Campus: Kelburn