School of
Engineering and Computer Science
Te Kura Mātai Pūkaha, Pūrorohiko

Prescription

This course will cover fundamental concepts in linear algebra and multivariable calculus and their applications to physical and engineering problems. Mathematical software will be used extensively. Topics covered will include dimensionality, linear transformations, matrix decomposition, Taylor series, calculus of vector-valued functions and calculus of two-variable functions.

Course learning objectives

Students who pass this course should be able to:

1. Define fundamental concepts in linear algebra and multivariable calculus.
2. Describe ways in which linear algebra and multivariable calculus can be used to model physical and engineering problems.
3. Apply concepts and techniques in linear algebra and multivariable calculus to solve physical and engineering problems using software tools when appropriate.

Withdrawal from Course

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

Lecturers

Mark McGuinness (Coordinator)

mark.mcguinness@vuw.ac.nz 04 4635059

323 Cotton, Kelburn

Brendan Harding

brendan.harding@vuw.ac.nz

Byoung Du Kim

byoungdu.kim@vuw.ac.nz 04 4635665

434 Cotton, Kelburn

Teaching Format

This course will be taught using a combination of lectures and computer labs. There will be two 50-minute lectures per week for 12 weeks, and a 2-hour computer lab per week starting in Week 2. Lectures will be used to introduce fundamental concepts along with techniques for modelling and solving problems. The computer labs will be used to teach software tools that can model and visualise problems as well as compute solutions to them. The assignments will require use of the computer labs. If covid prevents attendance in person, provisions will be made for students to attend online.

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** 15:10 - 16:00 – LT118, Laby, Kelburn
- **Thursday** 15:10 - 16:00 – LT118, Laby, Kelburn

19 April 2021 - 30 May 2021

- **Tuesday** 15:10 - 16:00 – LT118, Laby, Kelburn
- **Thursday** 15:10 - 16:00 – LT118, Laby, Kelburn

Other Classes

Labs will start in Week 2, and are two hours a week.

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
6 assignments, each requiring approximately 10 hrs work	TBC	CLO: 2,3	60%
Test (2 hour duration)	TBC	CLO: 1,2,3	20%
Test (2 hour duration)	TBC	CLO: 1,2,3	20%

Penalties

Late assignments are not marked.

Extensions

Extensions must be asked for before the due date, and will be treated on a case by case basis by the lecturer. Assignments are due almost weekly so extensions can not be for more than a day or two.

Submission & Return

Assignment answers are to be submitted online by the due time using the link in the Blackboard menu. Marked assignments will be returned online to provide feedback on progress.

Required Equipment

The first half of this course will be lectured remotely, using Zoom. Students may use Zoom to attend lectures live online, or they may attend at the lecture theatre in person where the Zoom session will be made available. The second six weeks will be lectured in the allocated lecture theatres, recorded to video and webcast using a Panopto setup (not Zoom) so that students can again attend in person or live online. All lecture videos are saved and available a few hours later via Blackboard. If Covid levels change, lectures will if necessary become online only, live and recorded.

Workload

The student workload for this course is 150 hours.

Teaching Plan

Communication of Additional Information

Information will be communicated to students by posting it on the Blackboard site, and sometimes by email.

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: 33042

Points: 15
Prerequisites: (ENGR 121, 122) or (MATH 142, 151)
Duration: 22 February 2021 - 20 June 2021
Starts: Trimester 1
Campus: Kelburn