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

Prescription

Further mathematical techniques employed by electronic and computer systems engineers, with emphasis on methods of calculus, differential equations and linear Algebra. There is an emphasis on engineering applications and use of software.

Course learning objectives

Students who pass this course will be able to:

1. Interpret, manipulate and derive expressions and properties of differential and integral calculus, and linear algebra.
2. Apply concepts and techniques of calculus and linear algebra to analyse engineering systems and solve engineering problems.
3. Demonstrate mastery of a range of fundamental techniques for solving problems in calculus and linear algebra.
4. Demonstrate an ability to effectively use approximation and numerical techniques, especially in the estimation of physical parameters.
5. Creatively and collaboratively combine skills and knowledge from mathematics, physics, computing and engineering to model an engineering problem.

Course content

This course can be taken fully online. The following on-campus activities are available in this course. There will be online alternatives to these, but students are encouraged to attend these on campus where possible.

- Lectures
- Tutorials
- Staff office hours
- Laboratory classes
- Drop in help desk sessions

Lecture content will be recorded and made available online. Students may attend lectures on campus or live online.

Material to be covered:

Complex numbers; Introduction to linear algebra; Applications of differentiation; Integration of functions; Functions of several variables; Introduction to ordinary differential equations

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

Howard Lukefahr is in charge of the laboratory projects and reports.

Teaching Format

During the trimester, there will be four lectures per week most weeks, with a total of 30 lectures. Lectures are recorded to video and available to students for review. Students may attend in person, or live online using Zoom. Questions may be asked using Chat online in Zoom.

Labs are approximately fortnightly with specific times and dates posted on BlackBoard.

Students attend one two-hour lab most weeks, and students are also encouraged to attend one tutorial session each week. Labs and tutorials start in Week 2. Sign-ups for labs and tuts will be in the first week of lectures using myAllocator.

A Reading Plan, based on the lecture notes provided online, will be set up in advance for each week, to allow students to read ahead of the material for that week.

Lectures will not necessarily cover all of the examinable material. Note that examinable material includes all lecture notes, assignments and tutorials, and everything discussed during lecture times.

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: 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

- **Monday** 12:00 - 12:50 – LT118, Laby, Kelburn
- **Wednesday** 12:00 - 12:50 – LT118, Laby, Kelburn

- **Thursday** 12:00 - 12:50 – LT118, Laby, Kelburn
- **Friday** 12:00 - 12:50 – LT118, Laby, Kelburn

30 August 2021 - 10 October 2021

- **Monday** 12:00 - 12:50 – LT118, Laby, Kelburn
- **Wednesday** 12:00 - 12:50 – LT118, Laby, Kelburn
- **Thursday** 12:00 - 12:50 – LT118, Laby, Kelburn
- **Friday** 12:00 - 12:50 – LT118, Laby, Kelburn

Other Classes

Students are encouraged to attend at least one tutorial each week, on campus or online. Labs are approximately fortnightly and are best attended on campus. Online labs are possible only by special arrangement. Signup for Tutorials and Labs is in the first week of Trimester, and specific times and dates will be posted on BlackBoard.

Tutorials are offered each week from the second week of Trimester, and are a good preparation for the assignments. Attendance is highly recommended for one or more hours a week, but is optional. Students are welcome to attend more than one tutorial each week.

Set Texts and Recommended Readings

Required

A reading plan will be posted in advance online. These readings will be based on the provided lecture notes. The lecture notes provided will be detailed, and available online in advance of lectures. Lectures are intended to help understand the notes, rather than to cover every detail of the notes.

Recommended

The recommended text is useful for this course, especially if a student needs extra examples and details.

- Engineering Mathematics: A foundation for electronic, electrical, communications and systems engineers. A. Croft, R. Davison, M. Hargreaves & J. Flint. Pearson, UK. Any edition is OK

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

This course will be assessed through a combination of weekly assignments, lab reports, and two tests. The weekly tutorials are not assessed, but they do provide useful practice for the assignments.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
8 online assignments	Weekly	CLO: 1,2,3,4	25%
Two online tests (each one taking 2 hours, and worth 25%)	Week 7 and during the exam period	CLO: 1,2,3,4	50%
5 online Lab reports	Fortnightly	CLO: 1,2,3,4,5	25%

Penalties

Late assignments will not be marked. Late lab reports may lose marks.

Extensions

Extensions will be given if circumstances require. Please communicate these circumstances to the current lecturer, before the due date. Because assignments are weekly, extensions for assignments are rare and can only be for a day or two.

Submission & Return

Assignment answers and lab reports will be submitted by students online through the course website. It is important for students to immediately check the file they have uploaded, by downloading it again, to ensure it is the correct file. Feedback on marked assignments and reports will be provided to students online. **Test answers** will be submitted online by students.

Workload

In order to maintain satisfactory progress in ENGR 122, you should plan to spend an average of at least twelve hours per week or a total of 150 hours on this course.

Teaching Plan

A teaching plan with a detailed Reading Plan and assignment, Lab and Test timings, will be posted to the course home pages on Blackboard.

Communication of Additional Information

Announcements, lecture notes, videos of lectures, lab information, sample Tests, tutorials and assignments will be posted on the website (Blackboard).

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: 26053

Points: 15
Prerequisites: ENGR 121 or MATH 141;
Restrictions: the pair (MATH 142, 151)
Duration: 05 July 2021 - 07 November 2021
Starts: Trimester 2
Campus: Kelburn