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

Prescription

An introduction to the range of mathematical techniques employed by engineers, including functions, calculus, linear algebra, vector geometry, set theory, logic and probability. There is an emphasis on applications and modelling.

Course learning objectives

Students who pass this course should be able to:

1. Read, interpret and manipulate mathematical expressions and equations in a variety of contexts.
2. Apply mathematical concepts and techniques to analyse engineering systems and solve engineering problems.
3. Demonstrate mastery of a range of fundamental mathematical techniques.
4. Creatively and collaboratively combine skills and knowledge from mathematics, physics, computing and engineering to model an engineering problem.

Course content

The course is primarily offered in-person, and the tests will require in-person attendance for all students in the Wellington region. 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 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.

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 will use Zoom for online supervision of the tests, and you must be able to use Zoom with a camera, microphone, and screen-sharing. 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.

Topics covered in this course include: sets, number, functions, logic, algebraic techniques, trig functions, sequences, series, limits, differentiation, integration, vectors, matrix algebra and probability.

Required Academic Background

In 2021-2022, 12 credits of NCEA Level 3 in Mathematics/Statistics (or equivalent) will be

accepted for entry, due to disruptions to teaching, learning and assessment caused by COVID-19.

Withdrawal from Course

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

Lecturers

Dr Steven Archer (Coordinator)

steven.archer@vuw.ac.nz 04 886 4493

CO 547 Cotton Building (All Blocks), Gate 7, Kelburn Parade, Kelburn

Dr Howard Lukefahr

howard.lukefahr@vuw.ac.nz 04 886 5630

CO 341 Cotton Building (All Blocks), Gate 7, Kelburn Parade, Kelburn

Dr Tanya Gvozdeva

tanya.gvozdeva@vuw.ac.nz

CO 362 Cotton Building (All Blocks), Gate 7, Kelburn Parade, Kelburn

Teaching Format

Four lectures, one tutorial, and one two-hour lab most weeks. Lectures are recorded to video and available to students through BlackBoard.

Student feedback

Feedback from previous students is available at
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** 15:10 - 16:00 – MT228, Student Union, Kelburn
- **Wednesday** 13:10 - 14:00 – MT228, Student Union, Kelburn
- **Thursday** 15:10 - 16:00 – MT228, Student Union, Kelburn
- **Friday** 15:10 - 16:00 – MT228, Student Union, Kelburn

25 April 2022 - 05 June 2022

- **Monday** 15:10 - 16:00 – MT228, Student Union, Kelburn
- **Wednesday** 13:10 - 14:00 – MT228, Student Union, Kelburn
- **Thursday** 15:10 - 16:00 – MT228, Student Union, Kelburn
- **Friday** 15:10 - 16:00 – MT228, Student Union, Kelburn

Other Classes

A two-hour lab each week, for eight of the weeks available.

One hour tutorial each week

Set Texts and Recommended Readings

Required

There is no set text for this course. Detailed typeset lecture notes are made available online in the Home Pages.

Recommended

There is no set text for this course, but we follow Croft et al, the recommended text, very closely. It is also the text for ENGR 122, and can be purchased from Vic Books. Stroud's book is also recommended if students want to read further.

- *Engineering Mathematics: a Foundation for Electronic, Electrical, Communications and Systems Engineers*, 4th edition or later, by Anthony Croft, Robert Davison, Martin Hargreaves and James Flint, Pearson, 2012 or later.
- *Engineering Mathematics*, by K.A. Stroud, with Dexter J. Booth. Palgrave MacMillan, London.

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 is assessed through a combination of assignments, tests and lab reports. In order to gain maximum marks, it is highly recommended students attempt all assessments.

This assessment information is subject to change for 2022.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Assignments	Most Weeks	CLO: 1,2,3,4	25%
Lab Reports	See website	CLO: 1,2,3,4	25%
Tests (2)	See website	CLO: 1,2,3,4	50%

Penalties

Late assignments will not be marked. You can miss up to two (out of eight) assignments without losing any credit.

Late lab reports will result in lost marks, 10% loss for each day up to five days late. Later reports will not be marked.

Any plagiarism is likely to result in zero marks for both parties.

Extensions

Extensions are not given for assignments or labs. Late assignments will not be marked. Lab reports that are more than five days late are not marked.

Submission & Return

All lab reports and assignments are submitted through the ECS online system, accessed through the ENGR 121 home pages.

Lab,asssignment and test results are posted on the ECS online system. Feedback on lab reports and assignments are provided through the course Home page.

Marking Criteria

All assignments have the same value and will be marked fully. You will be provided with a marking schedule which you should check against your marked work.

Workload

In order to maintain satisfactory progress in ENGR 121, plan to spend about eleven hours a week during lecture times. One breakdown of this would be four hours in lectures, two hours in labs, one hour in a tutorial, two hours writing reports and assignments, and two hours reading and reviewing notes and tuts.

Teaching Plan

Communication of Additional Information

The course homepages on the web are the primary source of additional information. There will be links to these from Blackboard and from ECS and SMS course list web pages. Lectures will be recorded to video, available from the next day through 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: 26052

Points: 15
Prerequisites: 16 AS credits NCEA Level 3 Mathematics (or equivalent) or MATH 132;
Restrictions: Any pair (MATH 141/QUAN 111, MATH 151/161/177)
Duration: 28 February 2022 - 26 June 2022
Starts: Trimester 1
Campus: Kelburn