

# ENGR121 (2018) - Engineering Mathematics Foundations

## Prescription

An introduction to the range of mathematical techniques employed by engineers, including functions and calculus, linear algebra and vector geometry, probability and statistics. 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

Probability, sets, number, functions, logic, algebraic techniques, trig functions, sequences, series, limits, differentiation, integration, vectors, matrix algebra.

## Required Academic Background

Sixteen credits of NCEA Level 3 Mathematics and Statistics

## Withdrawal from Course

Withdrawal dates and process:

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

## Lecturers

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**Mark McGuinness (Coordinator)**

Mark.McGuinness@vuw.ac.nz 04 4635059

323 Cotton, Kelburn

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**Thuong Nguyen**

thuong.nguyen@vuw.ac.nz 04 4635274

432 Cotton, Kelburn

## Administrators

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Steven Archer

steven.archer@vuw.ac.nz

04 4635233 ext 8316

CO363 Cotton, 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](http://www.cad.vuw.ac.nz/feedback/feedback_display.php)

## Dates (trimester, teaching & break dates)

- Teaching: 05 March 2018 - 08 June 2018
- Break: 23 April 2018 - 27 April 2018
- Study period: 11 June 2018 - 14 June 2018
- Exam period: 15 June 2018 - 04 July 2018

## Class Times and Room Numbers

### 05 March 2018 - 25 March 2018

- **Thursday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Friday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn

### 05 March 2018 - 01 April 2018

- **Monday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Tuesday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn

### 02 April 2018 - 22 April 2018

- **Thursday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Friday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn

### 09 April 2018 - 22 April 2018

- **Monday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Tuesday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn

### 30 April 2018 - 10 June 2018

- **Monday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Tuesday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Thursday** 09:00 - 09:50 – LT103, Maclaurin, Kelburn
- **Friday** 09:00 - 09:50 – LT103, Maclaurin, 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

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

- obtain at least 40% in the final exam.

*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

Assignments, lab reports, Tests, and final exam are used to calculate an overall percentage on which your final grade is based.

Assignments can earn up to 10% in total, two Tests up to 10% each, the best three of four lab reports a total of 20%. The final exam is worth at least 50%, up to 80%, depending on whether it has a better mark than assignments and Tests.

If a student does poorly in either assignments or the two Tests, the low-scoring assessments are not counted. The marks from these are then loaded onto the final exam if that gives a better overall mark. Lab reports are always counted, however. So if a student does the final exam, for example, but does poorly in assignments and both tests, the exam might be worth 80% and the lab reports 20%, and the low marks would not be used.

Assignments (best six out of eight)	CLO: 1,2,3,4	10%
Labs (best three out of four)	CLO: 1,2,3,4	20%
Tests (two)	CLO: 1,2,3,4	20%
Final Exam	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. The best three out of the four lab reports are counted towards lab credit; the worst lab mark is discarded.

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 are submitted through the ECS online system, accessed through the ENGR 121 home pages. Assignments are submitted on paper each week, most weeks, in the assignment boxes provided on level three of Cotton building near Room CO360.

Lab and assignment results are posted to Blackboard. Feedback on lab reports is provided through the course Home page. Feedback on assignments is by collecting marked assignments from the School of Engineering Office in CO358 at designated times.

## Marking Criteria

Assignments are marked as a feedback to the student on how they are doing. If the feedback mark is 40% or better, the assignment is classed as "satisfactory". If a student gets all but two (six out of eight, say) satisfactory assignments, or better, the resulting assignment mark awarded is the full 10%. Fewer satisfactory assignments attract a proportion of the 10% available.

The best three lab reports are used out of the four available, to allocated the 20% total available. The worst lab report is discarded.

## 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

See: [https://ecs.victoria.ac.nz/Courses/ENGR121\\_2018T1/LectureSchedule](https://ecs.victoria.ac.nz/Courses/ENGR121_2018T1/LectureSchedule)

## 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.victoria.ac.nz/students/study/exams/integrity-plagiarism>
- Academic Progress: <https://www.victoria.ac.nz/students/study/progress/academic-progress> (including restrictions and non-engagement)
- Dates and deadlines: <https://www.victoria.ac.nz/students/study/dates>
- Grades: <https://www.victoria.ac.nz/students/study/progress/grades>
- Special passes: Refer to the Assessment Handbook, at <https://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>
- Statutes and policies, e.g. Student Conduct Statute: <https://www.victoria.ac.nz/about/governance/strategy>
- Student support: <https://www.victoria.ac.nz/students/support>
- Students with disabilities: [https://www.victoria.ac.nz/st\\_services/disability/](https://www.victoria.ac.nz/st_services/disability/)
- Student Charter: <https://www.victoria.ac.nz/learning-teaching/learning-partnerships/student-charter>
- Terms and Conditions: <https://www.victoria.ac.nz/study/apply-enrol/terms-conditions/student-contract>
- Turnitin: <http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin>
- University structure: <https://www.victoria.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:** 05 March 2018 - 04 July 2018

**Starts:** Trimester 1

**Campus:** Kelburn