

ECEN303 (2018) - Analogue Electronics

Prescription

This course expands on ECEN 201, with an emphasis on developing analogue circuit design skills and applying them to the design of electronic instrumentation. The course covers to an advanced level, operational amplifier imperfections, noise, feedback and stability and operational amplifier applications such as active filters, differential amplifiers and oscillators. In addition, the course provides an introduction to diodes and diode circuits, BJTs and BJT circuits used within operational amplifiers, linear and switching power supplies and high power amplifiers.

Course learning objectives

Students who pass this course should be able to:

1. Analyse the operation of a range of analogue circuits including amplifiers, filters, oscillators and power supplies. 3(b) .
2. Design standard analogue electronic circuits with regard to practical considerations, such as component imperfections and thermal management. 3(b), 3(e).
3. Design and demonstrate the operation of a complex analogue system. 3(b), 3(d), 3(f).
4. Use modern test equipment and design tools in the the design and testing of electronic systems. 3(b), 3(f).

Course content

Particular Topics covered in the course include

- Operational Amplifiers Circuits
- Printed Circuit Board Design
- Operational Amplifier Imperfections
- Operational Amplifier Internals
- Stability in Operational Amplifier circuits
- Filters
- Power supplies
- Power amplifiers
- Positive Feedback circuits
- Oscillators
- Thermal management
- Comparators

Withdrawal from Course

Withdrawal dates and process:

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

Lecturers

Ciaran Moore (Coordinator)

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Teaching Format

During the trimester there will be two lectures and one tutorial per week.

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 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** 11:00 - 11:50 – 201, Easterfield, Kelburn

05 March 2018 - 01 April 2018

- **Monday** 11:00 - 11:50 – 201, Easterfield, Kelburn
- **Wednesday** 11:00 - 11:50 – 201, Easterfield, Kelburn

02 April 2018 - 22 April 2018

- **Thursday** 11:00 - 11:50 – 201, Easterfield, Kelburn

09 April 2018 - 22 April 2018

- **Monday** 11:00 - 11:50 – 201, Easterfield, Kelburn
- **Wednesday** 11:00 - 11:50 – 201, Easterfield, Kelburn

30 April 2018 - 10 June 2018

- **Monday** 11:00 - 11:50 – 201, Easterfield, Kelburn
- **Wednesday** 11:00 - 11:50 – 201, Easterfield, Kelburn
- **Thursday** 11:00 - 11:50 – 201, Easterfield, Kelburn

Other Classes

Labs will be held weekly in CO239.

Set Texts and Recommended Readings

Required

There are no required texts for this offering.

Recommended

The recommended textbook for ECEN 303 is "Design with Operational Amplifiers and Analog Integrated Circuits" (3rd edition) by Sergio Franco. Two further useful texts for the course are Sedra & Smith, "Microelectronic Circuits" (4th or 5th edition), and Horowitz & Hill, "The Art of Electronics," (2nd or 3rd edition) both available in the University bookshop (or 2nd hand for older editions). These texts are available on closed reserve in the library.

- Sergio Franco, "*Design with Operational Amplifiers and Analog Integrated Circuits*" (3rd edition)
- Sedra & Smith, "*Microelectronic Circuits*" (4th or 5th edition)

- Horowitz & Hill, "*The Art of Electronics*" (2nd or 3rd edition)

Mandatory Course Requirements

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

- Achieve at least a **D** in the examination.
- Submit the project report.

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 laboratories, assignments, design project, and a final examination.

Laboratories (9)	~Weekly	CLO: 1,2,4	10%
Assignments (6)	~Weekly	CLO: 1,2	30%
Project	Week 10	CLO: 2,3,4	20%
Final Examination (2 hours)		CLO: 1,2	40%

Penalties

Work submitted late will be penalised at 10%/day; work submitted more than five working days late will not be marked. Work submitted after the model solutions have been made available will not be marked.

Extensions

Individual extensions will only be granted in exceptional personal circumstances, and should be negotiated with the course coordinator before the deadline whenever possible. Documentation (eg, medical certificate) may be required.

Submission & Return

The means of submission varies for different pieces of assessment. For hard copy submissions, a drop box is located in the level 2 hallway in Cotton building. Detailed submission instructions are included on each assessment item.

Work will be returned during regularly scheduled lecture times.

Workload

In order to maintain satisfactory progress in ECEN 303, you should plan to spend an average of 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures and tutorials: 3
- Readings: 2
- Assignments: 1
- Labs/project: 4

Teaching Plan

See https://ecs.victoria.ac.nz/Courses/ECEN303_2018T1/LectureSchedule

Communication of Additional Information

The main means of communication outside of lectures will be the ECEN303 web area at https://ecs.victoria.ac.nz/Courses/ECEN303_2018T1/.

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/
- 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: [18514](#)

Points: 15

Prerequisites: ECEN 203 (or PHYS 235); ECEN 204;

Restrictions: PHYS 341

Duration: 05 March 2018 - 04 July 2018

Starts: Trimester 1

Campus: Kelburn