

# Analogue Electronics - PROVISIONAL Course Outline

## ECEN 303: 2012 Trimester 2

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This document sets out the workload and assessment requirements for ECEN 303. It also provides contact information for staff involved in the course. If the contents of this document are altered during the course, you will be advised of the change by an announcement in lectures and/or on the course web site. A printed copy of this document is held in the School Office.

### Objectives

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The prime purpose of ECEN303 (and PHYS341) is to teach students to design analogue circuits for use in scientific instrumentation, data acquisition, and communications. A considerable emphasis is placed on design skills.

### Objectives

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This course contributes to the graduate attributes of the BE as indicated below. By the end of the course, students 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).

Particular Topics covered in the course include

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

### Textbook

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

### Lectures, Tutorials and Laboratories

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A schedule of lecture topics, readings, and assignment due dates is available online

Classes for ECEN 303 are:

Lectures: Monday and Tuesday at 3:10pm in AM105.

Tutorials: Thursday at 3:10pm in AM105.

Labs: Held in Electronics Laboratory CO250. There will be two laboratory sessions on Tuesday and Thursday from 9am-1pm. You will need to attend only one of these sessions. Approximately half of the laboratory sessions will be individual exercise, the other half will be spent on the group design project.

## Assignments

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Assignments will be distributed in the Monday lectures during weeks one, three, five, seven and nine. They will be due at or before the lecture two weeks later (that is, during weeks three, five, seven, nine and 11). Each assignment will contain one analysis question and one design question.

## Workload

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

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

## School of Engineering and Computer Science

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The School office is located on level three of the Cotton Building (Cotton 358).

The notice board for ECEN 303 is located on the second floor of the Cotton Building.

## Staff

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The course organiser for ECEN 303 is Chris Hollitt. Ramesh Rayudu also lectures in the course. Their contact details are:

- *Christopher Hollitt*
- Alan MacDiarmid 223
- +64 4 463 6965
- Christopher.Hollitt@ecs.vuw.ac.nz
  
- *Ramesh Rayudu*
- Cotton 252
- 463 5233 x8068
- Ramesh.Rayudu@ecs.vuw.ac.nz

*Tutor details*

## Announcements and Communication

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The main means of communication outside of lectures will be the ECEN 303 web area at [http://ecs.victoria.ac.nz/Courses/ECEN303\\_2012T2/](http://ecs.victoria.ac.nz/Courses/ECEN303_2012T2/). There you will find, among other things, this document, the lecture schedule and assignment handouts, and the ECEN 303 Forum. The forum is a web-based bulletin board system. Questions and comments can be posted to the forum, and staff will read these posts and frequently respond to them.

# Assessment

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Your grade for ECEN 303 will be determined based on the following assessment weightings:

<u>Item</u>	<u>Weight</u>
Assignments	20%
Design project	20%
Regular laboratories	10%
Final Examination	50%

Assignments will be weighted equally. Lab reports are due in at the lab session immediately following that during which the work was done. The design exercise is due in on the last day of the trimester (5pm Friday 19th of October).

## Tests and Exams

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There is no terms test for ECEN 303.

The timetable for final examinations will be available from the University web site and will be posted on a notice board outside the faculty office. The final examination will be three hours long. Paper non-English to English dictionaries will be permitted, as will silent, non-programmable calculators with cleared memory. The examination period for trimester 2 is 26 Oct - 17 Nov.

## Plagiarism

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Working Together and Plagiarism

We encourage you to discuss the principles of the course and assignments with other students, to help and seek help with programming details, problems involving the lab machines. However, any work you hand in must be your own work.

The School policy on Plagiarism (claiming other people's work as your own) is available from the course home page. Please read it. We will penalise anyone we find plagiarising, whether from students currently doing the course, or from other sources. Students who knowingly allow other students to copy their work may also be penalised. If you have had help from someone else (other than a tutor), it is always safe to state the help that you got. For example, if you had help from someone else in writing a component of your code, it is not plagiarism as long as you state (eg, as a comment in the code) who helped you in writing the method.

## Mandatory Requirements

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To fulfil mandatory requirements for the course a student must

- Achieve at least a D in the examination.
- Contribute significantly to the group project.
- Submit answer sheets to all of the laboratories.

## Passing ECEN 303

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To pass ECEN 303, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

## Withdrawal

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The last date for withdrawal from ECEN 303 with entitlement to a refund of tuition fees is Friday 27 July 2012. The last date for withdrawal without being regarded as having failed the course is Friday 28 Sept 2012 -- though later

withdrawals may be approved by the Dean in special circumstances.

## Rules & Policies

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Find key dates, explanations of grades and other useful information at <http://www.victoria.ac.nz/home/study>.

Find out about academic progress and restricted enrolment at <http://www.victoria.ac.nz/home/study/academic-progress>.

The University's statutes and policies are available at <http://www.victoria.ac.nz/home/about/policy>, except qualification statutes, which are available via the Calendar webpage at <http://www.victoria.ac.nz/home/study/calendar> (See Section C).

Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at [http://www.victoria.ac.nz/home/about\\_victoria/avcacademic/default.aspx](http://www.victoria.ac.nz/home/about_victoria/avcacademic/default.aspx)

All students are expected to be familiar with the following regulations and policies, which are available from the school web site:

### Grievances

#### Student and Staff Conduct

#### Meeting the Needs of Students with Disabilities

#### Student Support

#### Academic Integrity and Plagiarism

#### Dates and Deadlines including Withdrawal dates

#### School Laboratory Hours and Rules

#### Printing Allocations

#### Expectations of Students in ECS courses

The School of Engineering and Computer Science strives to anticipate all problems associated with its courses, laboratories and equipment. We hope you will find that your courses meet your expectations of a quality learning experience.

If you think we have overlooked something or would like to make a suggestion feel free to talk to your course organiser or lecturer.

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