

Digital Electronics - Course Outline

ECEN 202: 2015 Trimester 2

This document sets out the workload and assessment requirements for ECEN 202. 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.

Course Description

ECEN 202 provides a practical introduction to the design and construction of basic digital electronic circuits. It studies combinational and sequential logic and the application of such devices in practical logic circuits. A strong focus is placed on the design of sequential logic circuits using the state machine technique. It will also look at special function logic circuits and memory devices. Emphasis is placed in the laboratory on construction techniques and fault finding. The effective presentation of laboratory results in written reports forms an integral part of the course.

Prerequisites

ENGR 101 or PHYS 115; 15 pts from ENGR121 or MATH (141, 142, 151, 161) Restrictions: PHYS 234

Objectives

By the end of the course, students should be able to:

1. Describe the properties, construction and operating characteristics of digital integrated circuits from the most important CMOS and TTL logic families. (BE graduate attribute 3(a))
 2. Describe the basic logic operations using Boolean algebra, truth tables and logic circuits and be able to simplify complex logic circuits via Boolean algebra and the K map method. (BE graduate attribute 3(a))
 3. Use the state machine method in combination with various types of flip-flops to create sequential circuits for synchronisation, frequency division and counting. (BE graduate attribute 3(a,b,c))
 4. Describe the design and application of a selection of special function ICs. (BE graduate attribute 3(a, b))
 5. Effectively communicate technical results by producing competent written reports and oral presentations. (BE graduate attribute 2(b))
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Course Materials

Core class notes and laboratory instructions will be available on the course blackboard site. In addition, students may be required to take down additional notes in class. No textbook is required, but the book "Digital Systems", by R J Tocci may be used as additional reading. The library should have some copies on closed reserve and on 3-day loan. Any edition from the 7th or later is suitable.

Lectures, Tutorials, Laboratories, and Practical work

Lectures for ECEN 202 are held 13 July – 23 August and 7 September – 18 October on Mondays, Tuesdays and Thursdays, 10:00 – 10:50 in MYLT102.

One three-hour lab will run weekly in LB217. Lab session times will be confirmed in Week 1. Allocation to lab sessions will take place in the first lecture. Students will complete the labs in pairs or triples and will submit individual lab reports.

Assignments and Projects

Assignments will be handed out fortnightly throughout the course. They will be due a week later in the assignment boxes outside LB217.

A design project will be handed out in week 6 and will be due in week 12. The design project will be completed in pairs, and will conclude with an individual report. Lab sessions in weeks 9, 10, and 11 will be set aside for project work.

Workload

In order to maintain satisfactory progress in ECEN 202, you should plan to spend an average of at least 10-12 hours per week on this paper, including during exam periods. A plausible and approximate breakdown for these hours would be:

- Lectures and tutorials: 3 hours
- Labs: 3 hours
- Assignments: 2 hours
- Readings: 2 hours

School of Engineering and Computer Science

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

The notice board for ECEN 202 is located on the second floor of the Cotton Building.

Staff

The course organiser for ECEN 202 is Ciaran Moore. The lecturers for the course are Ciaran Moore, Pawel Dmochowski, and Gideon Gouws. Their contact details are:

- [Ciaran Moore](#)
- [MacDiarmid 227](#)
- +64 4 463 5233 x 8931
- Ciaran.Moore@ecs.vuw.ac.nz

- [Pawel Dmochowski](#)
- [MacDiarmid 419](#)
- +64 4 463 5948
- Pawel.Dmochowski@ecs.vuw.ac.nz

- [Gideon Gouws](#)
- [MacDiarmid 225](#)
- +64 4 463 5952
- Gideon.Gouws@ecs.vuw.ac.nz

All three lecturers operate an open door policy with respect to office hours.

The tutors for the course are Peter Heesterman, Nick Gadd, and Farzaneh Fadakar.

The class representative is Mayur Panchal, panchal.mayur2@gmail.com.

Announcements and Communication

The main means of communication outside of lectures will be the ECEN 202 Blackboard area at <http://blackboard.vuw.ac.nz>. Course materials and other information will be posted there regularly. Students should check Blackboard regularly.

Assessment

Your grade for ECEN 202 will be determined based on the following assessment weightings:

<u>Item</u>	<u>Weight</u>	<u>Objectives Assessed</u>
Test 1 (60 minutes)	25%	1-2
Test 2 (60 minutes)	25%	3-4
Design Exercise	20%	3-5
Assignments	10%	1-5
Labs	15%	1-5
Lab Report	5%	5

Tests and Exams

There is no final exam for ECEN 202. There will be two 60 minute tests, the first on Thursday 20 August 2015, and the second on Thursday 15 October 2015. The time and location for these tests will be advised during lectures and on blackboard at least one week prior.

Please contact any of the course lecturers as soon as possible if you are unable to attend either of these tests.

Practical Work

Weekly labs will run in LB217 at times to be confirmed. Additionally, there will be a design exercise (project) that will run during scheduled lab sessions after the mid-term break. Full details of the design exercise and its reporting requirements will be handed out during the course.

You are required to keep detailed experimental notes for all experiments in a logbook. Data acquired and graphs plotted should also be stored electronically and kept until the end of the course. A 2B5 hardcover exercise book is ideal for this and a single logbook can be kept for ECEN201 and ECEN202.

At the end of each laboratory you will be required to submit a short laboratory report. This report will be based on a number of questions asked at the end of each laboratory script. This report must be handed in no later than one week after the experiment has been scheduled.

Your final mark for each laboratory will consist of a mark for your report as well as a mark assigned by the lecturer/lab demonstrator for your contribution in the laboratory.

Plagiarism

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 Course Requirements

Mandatory course requirements are as follows:

- Satisfactory completion of the design exercise.
- Satisfactory completion of at least five of the six laboratory experiments.
- A minimum of 40% averaged over the two in-term tests.

Late Work

All work is due on the due date. Marks will be deducted at a rate of 10% of the full mark for each working day late. Work will not be marked if more than one week late. Extensions must be requested in writing (email) BEFORE the due date and will only be given in exceptional circumstances. In the event of an aegrotat application, regular submission and performance in assignments and laboratories will contribute substantially to the outcome.

Passing ECEN 202

To pass ECEN 202, a student must satisfy mandatory requirements and gain at least a **C-** grade overall.

Withdrawal

The last date for withdrawal from ECEN 202 with entitlement to a refund of tuition fees is Friday 24 July 2015. The last date for withdrawal without being regarded as having failed the course is Friday 25 September 2015 -- though later withdrawals may be approved by the Dean in special circumstances.

Course Feedback

The course feedback for ECEN 202 is available [here](#).

Rules & Policies

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/avcacademic>

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.

[Course Outline as PDF](#)
