

Communication Engineering - Course Outline

ECEN 310: 2016 Trimester 2

This document sets out the workload and assessment requirements for ECEN 310. 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

Upon completion of the course, the students should be able to demonstrate the understanding of:

1. analogue and digital modulation techniques, including trade-offs and relative merits [3\(a\)](#).
2. effects of bandlimited channels and the transmitter design techniques to avoid intersymbol interference [3\(a\)](#) [3\(c\)](#).
3. effects of additive noise on the system performance and receiver design technique to mitigate its effects [3\(a\)](#) [3\(c\)](#).
4. the basics of wireless channel characteristics and modeling [3\(a\)](#) [3\(c\)](#).
5. Monte Carlo simulations of system performance

Objectives 1-4 are assessed primarily by written assignments and the examination. Objective 5 is assessed during laboratory sessions.

Textbook

The **required** textbook for the course is

- Proakis and Salehi, *Fundamentals of Communication Systems*, 2ed, 2014, Pearson (International Edition or otherwise)

note: the students are expected to complete the reading assignments given in the [course schedule](#)

In addition there are a large number of textbooks covering the principles of communications systems. Examples include

- Haykin and Moher, *Introduction to analogue and digital communications*, 2ed, 2007, Wiley
- Ziemer and Tranter, *Principles of Communications - Systems Modulation and Noise*, 6ed, 2009, Wiley
- Couch, *Digital and Analog Communication Systems*, 7ed, 2006, Prentice Hall
- Rappaport, *Wireless Communications, Principles & Practice*, 1ed, 1996, Prentice Hall
- Lathi and Ding, *Modern Digital and Analog Communication Systems*, 4ed, 2010, Oxford

Lectures, Tutorials, Laboratories, and Practical work

- Lectures: Mon, Thu 4:10-5pm CO118 and Wed 4:10-5pm CO119
- Tutorial will be held in selected lecture slots, as specified by the [course schedule](#)
- Laboratories: TBA, CO249 (in weeks specified by the [course schedule](#))

Assignments and Projects

There will be 5 assignments due on Thursdays on weeks specified by the [course schedule](#). These may require basic Matlab scripts. The solutions will be discussed in the tutorial the following week. Late submissions **will not** be considered due to short turn around.

Four laboratory experiments will be held, including both hardware and Matlab-based exercises. They are due 2 weeks later.

Assignments and labs will be submitted to the ECEN 310 hand in box located in Cotton level two.

Workload

To maintain satisfactory progress in ECEN 310, you should spend on average at least 10 hours per week on this course. A plausible and approximate weekly breakdown for these hours would be:

- Lectures and tutorials: 3 hours
- Laboratory sessions and project work: 3 hours
- Assignments: 2 hours
- Preparatory reading and problem solving: 3 hours.

Course Content

The following is a preliminary outline of the topics covered in the lectures.

- Communication System Overview
- Amplitude Modulation
- Frequency Modulation
- Sampling, Quantisation and Pulse Code Modulation
- Digital Modulation and Noise Performance (Matched Filter Receiver, BER, Signal Constellations)
- Basics of Wireless Channel Characteristics
- OFDM, Equalisation
- Diversity Combining and basics of MIMO

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 310 is located on the second floor of the Cotton Building.

Staff

The course coordinator and lecturer for ECEN 310 is [Dr Pawel Dmochowski](#)

Contact details are:

- [Pawel Dmochowski](#)
- [AM419](#)
- 463 5948
- pawel.dmochowski@vuw.ac.nz
- office hours: Thursdays 12-1 and Fridays 1-2 (or email for appointment)

- Lab demonstrator and marker is [Harsh Tataria](#)

- Class Rep: [Andrew Ang](#)

Announcements and Communication

The main means of communication outside of lectures will be the ECEN 310 web area at http://ecs.victoria.ac.nz/Courses/ECEN310_2016T2/. There you will find, among other things, this document, the [lecture schedule](#) and [assignment handouts](#).

Assessment

Your grade for ECEN 310 will be determined based on the following assessment weightings:

<u>Item</u>	<u>Weight</u>
Assignments (4-5)	15%
Labs (3-4)	10%
Project	10%
Test	20%
Final Exam	45%

Tests and Exams

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 **two** hours long. No computers, electronic calculators or similar device will be allowed in the final examination. Paper non-English to English dictionaries will be permitted. The examination period for trimester 2 is 21 October - 12 November.

Practical Work

Description of assignments / projects / etc, including rough dates and submission processes

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 Requirements

It is expected that all work will be completed and submitted for assessment. A fail grade will be issued to any student who does not achieve at least a **D** grade for the final exam.

Passing ECEN 310

To pass ECEN 310, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

Withdrawal

The last date for withdrawal from ECEN 310 with entitlement to a refund of tuition fees is Friday 22 July 2016. The last date for withdrawal without being regarded as having failed the course is Friday 23 September 2016 -- though later withdrawals may be approved by the Dean in special circumstances.

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](#)
