Special Topic (Information Theory and Coding) - Course Outline

ECEN 426 Information Theory and Coding:

2012 Trimester 1

This document sets out the workload and assessment requirements for ECEN 426. 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

By the end of the course, students should be able to perform the following, and in doing so have acquired specific graduate attributes (linked in the electronic copy of this document):

- Demonstrate an understanding of fundamental concepts in information theory by being able to evaluate the entropy, differential entropy, mutual information, channel capacity, and rate-distortion function for common communication systems and signals. 3(a) 3(c)
- Implement fundamental source coding methods, including quantization, lossless coding, and decorrelation methods, and to devise efficient coding architectures. 3(b)
- Implement some of the basic channel coding methods (a subset of Hamming, BCH, Reed-Solomon, and low-density parity-check codes). 3(b)

All objectives are primarily assessed by a midterm and a final exam, and to a lesser degree by the grades for the written homework assignments. (The main purpose of the assignments is to learn the material.)

Textbook

The textbooks for ECEN 426 are:

- *Elements of Information Theory*, 2nd Edition Thomas M. Cover, Joy A. Thomas, ISBN: 978-0-471-24195-9, Wiley.
- *A Basis for Source Coding*, W. Bastiaan Kleijn, (will be supplied as pdf file).

Lectures, Tutorials, Laboratories, and Practical work

- Lectures: Wednesdays 9:00-10:50 in Co255
- Exercises: Mondays 9:00-9:50 in VZ107; Tuesdays 9:00-9:50 in Co523A
- A more detailed lecture and exercise schedule with the lecture topics, readings, and assignment due dates is available online.

Assignments and Projects

The weekly assignment will be a set of relevant problems from the books we are working with. The problems are to be handed in in class.

Workload

In order to maintain satisfactory progress in ECEN 426, you should plan to spend an average of at least *15* hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures and tutorials: 3-4
- Readings: 6
- Assignments: 6

School of Engineering and Computer Science

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

Staff

The course organiser for ECEN 426 is Bastiaan Kleijn and he is the only lecturer. His contact details are:

- *BastiaanKleijn*
- Alan MaDiarmid 226
- +64 4 463 6730

Tutor details

No separate tutors.

Class Representative

Tim Sherry is the class representative. In this role he will assist in the communication between staff and students and is a point of contact for students.

Announcements and Communication

The main means of communication outside of lectures will be the ECEN 426 web area at http://ecs.victoria.ac.nz/Courses/ECEN426_2012T1/. There you will find, among other things, this document, the lecture schedule and assignment handouts, and the ECEN 426 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

Your grade for ECEN 426 will be determined based on the following assessment weightings (we may introduce assignments if the class favors this)

Item	Weight
Homework	20 %
Midterm	30 %
Final Examination	50 %

Tests and Exams

Contact the instructor if you cannot be at an exam.

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. 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 1 is 15 June - 4 July.

Practical Work

The homework will be assigned on a weekly basis.

Late homework will receive zero mark.

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

At least 75 % of the homework must be handed in.

Both midterm and final examination are mandatory.

Passing ECEN 426

To pass ECEN 426, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

Withdrawal

The last date for withdrawal from ECEN 426 with entitlement to a refund of tuition fees is Friday 16 March 2012. The last date for withdrawal without being regarded as having failed the course is Friday 18 May 2012 -- 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.