Data Acquisition - Course Outline

ECEN 201: 2012 Trimester 1

The course provides an introduction to the basic measurement and data analysis skills needed in engineering applications. In particular the course will focus on the application of computerized data acquisition systems using the LabVIEW software package and the associated analog to digital converter circuitry and instrumentation. It will also introduce the student to the use of programmable logic controllers (PLC) for industrial control applications.

Objectives

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

1. Understand the fundamental principles of analog to digital conversion for computerised data acquisition systems and be able to use such systems for the collection of technical data. (BE graduate attribute 3(a))
2. Understand the fundamental properties and limitations of sensor devices that are important for measurement applications. (BE graduate attribute 3(a))
3. Be able to use data acquisition and analysis software packages which are important for measurement applications. (BE graduate attribute 3(b))
4. Be familiar with the basic construction, functions and applications of a programmable logic controller (PLC). (BE graduate attribute 3(a, b))
5. Be able to use ladder logic programming to implement basic control functions on the PLC. (BE graduate attribute 3(b, c))

Prerequisites

The prerequisites for ECEN 201 are:

- ENGR101
- MATH 151 or MATH 114.

Course Materials and Texts

A study guide containing the core class notes and laboratory instructions will be available from SCPS reception. In addition, students may be required to take down additional notes in class.

No textbook is required, but the book *Introduction to Engineering Experimentation* by Wheeler and Ganji (available on closed reserve in the library) may be useful as additional reading.

A number of other textbooks in the library may also be suitable to read further on the subject area.

Course Timetable

Lectures for ECEN 201 are:

- Mondays from 12.00 - 12.50 pm in AM104, and
- Wednesdays & Thursdays from 2.10 – 3.00 pm in AM105.

Labs for ECEN 201: One 4-hour lab per week on *Mondays 2.00 – 6.00 pm*, or *Fridays 2.00 – 6.00 pm in LB217*. Sign up to the labs will take place in the first lecture.

Assignments and Laboratory Work

The assessment for ECEN 201 involves assignments, one in-term test, weekly laboratories, and design exercises, as detailed below:

Assessed Item	Requirements	Due Date	Objectives Assessed
Laboratory Work	All to count	Weekly	1-5
Assignments	All to count	Weekly	1-5
In-terms Test		26 April 2012	1-3
Design Exercise		5 June 2012	4-5

All work is due in 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 1 week late. Extensions will be given only in exceptional circumstances, and if agreed before the due date. No late work will be accepted after the model solutions to any piece of assessment have been distributed to the class.

In the event of an aegrotat application, regular submission and performance in assignments and laboratories will contribute substantially to the outcome.

Workload

On average, students should plan to spend a minimum of 10 hours per point i.e., 150 hours for a 15 point course, or *10-12* hours per week, including exam periods, in order to achieve an average grade for this course.

School of Engineering and Computer Science

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

Staff

The course organiser and lecturer for ECEN 201 is Gideon Gouws. His contact details are as follows:

- *Gideon Gouws*
- AM225
- +64 4 463 5952
- Gideon.Gouws@ecs.vuw.ac.nz

Announcements and Communication

This course uses Blackboard. Course materials and other information will be posted on Blackboard. Students should check Blackboard regularly.

Registered students will find information on Blackboard at: http://blackboard.vuw.ac.nz

Assessment

Your grade for ECEN 201 will be determined based on the following assessment weightings:

Assessed Item	Weight
Laboratory Work	20%
Assignments	10%
In-terms Test	15%
Design Exercise	10%
Final Examination	45%

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

Mandatory course requirements are as follows:

1. Satisfactory completion of at least 7 laboratory sessions.
2. A mark of at least 40% in the final exam.
3. Satisfactory completion of the design exercise.

Passing ECEN 201

A final course mark (%) will be calculated as specified in the “Assessment” section above and grades will be assigned as follows:

Grade	Range of Course Marks (%)
A+	85% - 100%
A	80% - 84%
A-	75% - 79%
B+	70% - 74%
B	65% - 69%
B-	60% - 64%
C+	55% - 59%
C	50% - 54%
D	40% - 49%
E	0% - 39%
K	Failed to meet mandatory course requirements

To pass ECEN 201, a student must satisfy mandatory requirements and gain at least a **C** grade overall.

Withdrawal

The last date for withdrawal from ECEN 201 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.