

Introduction to Engineering Computation and Software Development

ENGGEN 131SC

Course Outline - Second Semester 2007

Why learn to use computers?

Computers are an integral part of modern-day engineering. By effectively using computers engineers can perform time consuming computations quickly and easily. They can control machinery and electronics, model complex environments, design sophisticated devices and analyse large amounts of experimental data. Computers also allow engineers to visualize their models, designs and ideas. Skilled use of computers can increase productivity and enhance the experience of everyone involved with engineering.

What will we learn?

In EngGen 131 you will learn how to create computing solutions to engineering problems. We will introduce you the basic building blocks you will need to develop these computing solutions and teach you how to bring them all together into your final piece of software. You will gain experience in the MATLAB environment and programming with MATLAB. You will learn how to program in C within the Microsoft Visual Studio development environment. You will use both MATLAB and C to develop computing solutions.

How will we learn?

The course is split into two sections: MATLAB and C. The first 6 weeks will be devoted to MATLAB programming and the second 6 weeks will be used for C programming. The weekly structure is the same for both sections:

1. Three (1 hour) lectures each week. The Friday lecture will be a flexible session for examples, revision, help with projects, etc.
2. One (2 hour) laboratory each week. The laboratories are a chance for students to get hands-on experience with both MATLAB and C.

How will we be assessed?

The assessment for the course is as follows:

- 10% Labs (for MATLAB and C)
- 12% MATLAB Project
- 12% C Project
- 7% MATLAB Test
- 8% C Revision Questions
- 1% Completing the online course survey
- 50% Exam (October November)

WARNING: Neither coursework nor exam may raise the average by more than 10%. **DO YOUR OWN COURSEWORK**, otherwise you will not know what you are doing in the exam and you will fail.

What do we do in the labs?

1. Show up! You will get a mark just for getting to your lab in the first 10 minutes.
2. Complete the lab. You will get another mark for working through the lab tasks and showing your completed task to one of your lab tutors.

Labs are held in:

- Engineering Level 3 Labs (401.311/401.312)
- Science Ground Floor Teaching Lab (GTL) 303.G75
- Engineering Level 4 Labs (403.409)

There will be a staff tutor and 2 (or more) graduate tutors there to help you with lab work.

What about the projects?

1. MATLAB Project Due Monday, August 20.
2. C Project Due Monday October 15.

Both projects will be submitted electronically via a Web Dropbox. After submission of your project you will be required to take part in a peer review (where you review work done by other students in EngGen 131). This is done using the Aropa Peer Review System <https://aropa.ec.auckland.ac.nz/>.

IMPORTANT: You may generally discuss the projects with tutors and other students, but they must be your own work. Any undue collaboration will result in 0 for each student involved. Talk to the Course Organiser before you submit if you have any doubts on this point.

How about the other assessment?

1. Mid-Course Test at the end of the Week 6 lab (week beginning August 20)
2. C Revision Questions will be explained further in class and will be due by the end of the semester.
3. Online Course Survey is at <https://webfeedback.se.auckland.ac.nz> and will be available to complete near the end of the course.
4. Examination in late October/early November.

What resources are there?

- **MATLAB Course Manual** There will be a MATLAB Course Manual containing the lecture overheads and the lab material for the MATLAB section of the course. This manual will be available for sale from The Faculty of Engineering Reception (on Level 4). The manuals will be available from July 9. This manual should be brought to all MATLAB lectures and lab sessions.
- **C Course Manual** There will also be a C Course Manual containing lecture and lab notes for the C section of the course. This manual will be available for sale from The Faculty of Engineering Reception (on Level 4). The manuals will be available from September 3. This manual should be brought to all C lectures and lab sessions.
- **CECIL** Announcements and marks will be available on CECIL. Please make sure to check your CECIL email regularly for any class announcements.
- **MATLAB Website** <http://escwiki.esc.auckland.ac.nz/courses/ENGGEN131>
- **C Website** <http://www.cs.auckland.ac.nz/enggen131s2c>
- **Class Forum** Available as part of the Computer Science & Software Engineering Forums (<https://forums.cs.auckland.ac.nz>). You need to log in to be able to see this forum.
- **MATLAB Software** If you wish to install MATLAB on your own computer this can be purchased from the Science Student Resource Centre (Basement level of the Maths Building 303).
- **OCTAVE** For those interested in trying “free software” there is a program called Octave which claims to be “mostly compatible with MATLAB”. The course staff can give no assistance or assurances about this software but you are welcome to look at it: <http://www.gnu.org/software/octave>
- **C Software** Visual Studio Express Edition (C++ version). Instructions on the best way to obtain this will be given when the C part of the course begins.
- **MATLAB TEXT** The *suggested* text for MATLAB is
“Introduction to MATLAB 7 for Engineers” by William J Palm III.
- **C TEXT** The *suggested* text for the course is
“Engineering problem Solving with C” by Delores M. Etter.
Both books are on “desk-copy” in the Engineering Library.

Course Staff:

- Dr Michael O’Sullivan – Course Organiser/MATLAB Lecturer (11am stream)
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- Dr Rosalind Archer - MATLAB Lecturer (8am stream)
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- Paul Denny – C Lecturer.
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- Tom McKay – Teaching Assistant
 - projects, test and lab assessment
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