ENGG1811 Computing for Engineers
COMP1081 Harnessing the Power of IT

Course Introduction

1. Course Aims

ENGG1811/COMP1081 is a combined introductory computing course covering the following topics:

- Introduction to popular applications (such as spreadsheets and databases) to solve computational problems.
- Introduction to procedural programming (using Visual Basic for Applications) to solve engineering, business and scientific tasks.
- Introduction to some of the current and emerging Information Technologies, with the aim to understanding their limitations/advantages and how they can be exploited to innovatively and effectively solve problems.

2. Student Learning Outcomes

After completing this course, students should be able to

- design, program, document and test Visual Basic for Applications (VBA) programs that accurately comply with a given specification.
- use applications such as spreadsheets and databases to effectively solve computational problems in science, engineering, commerce and humanities.
- gain an understanding of the limitations/advantages of some of the emerging IT technologies, and how to exploit them in solving engineering problems.

Lab exercises and assignment problems will test knowledge and skills you have acquired throughout the session (in particular for the first two topics). Questions in the Mid-Session test and the Final Written Exam will challenge your understanding of all the above three topics.

3. Teaching, Learning and Assessment

At university, the focus is on the self-directed search for knowledge. Lectures, labs, textbooks and recommended reading, assignments and exams are all provided as a service to assist you in this endeavour. It is your choice as to how much work you do in this course, whether it be preparation for classes, completion of assignments, study for exams or seeking assistance or extra work to extend and clarify your understanding. You must choose the approach that best suits your learning style and goals in this course. Note that the University expects you to do about 180 hours work for this course—including lectures, labs, and time spent on assignments. Of course this will vary according to your aims. The course is designed in such a way that passing the course will require a good understanding of the fundamental notions as well as good practical skills. This can only be achieved through regular and consistent work. If your aim is to obtain a high distinction then you will need to invest more time on this course.

Lectures

The aim of the lectures is to facilitate learning and understanding of the important concepts within course syllabus. They will provide the main source of course material delivered. There are three hours of lectures per week, divided into a 1-hour anf 2-hour block.

In the lectures, we will

- explain each topic
- demonstrate the principles in each topic with examples from the tools (spreadsheets, databases, programming) used in the course
- evaluate and discuss the relevance of the topic to IT and your career

You are invited to ask questions at the end of the class, or at any time if you think the question and answer is relevant to everyone else.

> Discussion with the person next to you in class is *not acceptable*, as it creates a level of noise that inevitably impacts on the rights of others who are trying to listen and learn.

Lecture Schedule

The proposed lecture schedule is:

Week	Topic
Week 1:	Computer Architectures and the Digital Revolution
Week 2:	Networks and the Internet
Week 3, 4:	Spreadsheets - Basics of a Spreadsheet, Predefined functions (statistical, lookup), Filters, Charts Analyzing Data - Descriptive Statistics, What-If Analysis, Goal Seek, Solver.

Week 5:	Databases - Introduction and Case studies
Week 6-12:	Problem Solving and Programming: Introduction to procedural programming and VBA, data types, variables and constants, operators and statements, selection (If and Select Case statements) and iteration (While and For statements), modularity using functions/subprograms, parameter passing. Program design, development, testing and debugging. Arrays, strings, collections, Excel object model, Macro Recorder. Problem solving case studies.
Week 13, 14:	Introduction to some of the current and emerging Information Technologies

Please note that the above schedule is subject to change. There is a one week break after week 9.

Laboratory Classes

Laboratory Classes give you a chance to **practise** problem solving and programming skills on small, well defined examples. The examples have been chosen to highlight particular aspects of problem solution, and will give you enough grounding in problem solving to assist you in completing your assignment work. Your tutor will be present in your Lab Class to answer any questions you may have.

All lab class exercises must be shown to your tutor during your scheduled lab class. The lab exercises will be available during the session via the course's web page. **Students are advised not to fall behind in laboratory work**. In order to get a mark for a lab exercise you must show your tutor a completed or substantially completed solution before the end of your scheduled lab class in the week that the exercise is released. If you cannot complete the exercise by the end of the scheduled lab, you may complete it in your own time and show it to your tutor in the next scheduled lab class. Your tutor will only mark it at the very beginning of the next scheduled lab class, and may award only partial marks. **After this time, you will not receive a mark for that particular lab exercise**.

Please note that at the time of marking your lab exercises, your tutor will ask you to solve other similar problems. You need to demonstrate that you are able to solve lab exercises and related problems, in order to receive any marks for your lab work. In other words, copying lab solutions is pointless!

If you are unable to attend your scheduled lab class due to illness or misadventure, then you should apply for special consideration and an extension may be granted. You can only have your lab work **marked** during **your** scheduled **lab class**. It is **not** possible to have your work marked in another class.

Your weekly lab class is 2 hours long and it starts in Week 2 of session.

Consultation

Each week, starting from Week 2, the lecturer or a tutor will be available to discuss with you, on a one-on-one basis, any aspect of the course that you are having problems with. This is the most personalised form of teaching for this course, and you should take every advantage of it, particularly if you are experiencing difficulties. Whan assignments are due additional consultations will be offered. There will be at least 4 consultation hours available every week.

Please **check the class web page for current consultation time**s (see "Consultations" in the left panel of the class web page).

Every effort will be made to see as many students as possible. Please come prepared in order to maximise the time that's available to you.

Assignments

Assignments give you the chance to practise what you have learned on relatively large problems (compared to the small exercises in the Lab Classes). Assignments are a very important part of this course, therefore it is essential that you attempt them yourself. There will be three assignments:

- Assignment 1 will be due in Week 5 (requirements will be available in week 2 or 3).
- Assignment 2 will be due in Week 10 (requirements will be available in week 8).
- Assignment 3 will be due in Week 14 (requirements will be available in week 11).

Assignments are to be completed in your own time. To maximise the learning benefits from doing assignments, it is essential that you start work on assignments early. Do not leave your assignments until the last minute. If you submit an assignment late, the maximum available mark is reduced by an amount (usually 10%) per day that it is late.

Assignment 1: the aim in this assignment is to carry out "smart" online research on a given topic. You need to find the required information available online on a given topic, properly organise this information, and produce an online report in the form of a web page(s).

Assignments 2 and 3: the aim for these assignments is to develop skills in all stages of the programming process: start by understanding the specification; design a method to solve the problem; refine this design; implement and document the design in a source file that consists of both the documentation and the program code; and test extensively to validate that the program meets the specification.

Examinations

A Mid-Session Test will be held in Week 7 during your scheduled lab class.

The final written examination will be held during the examination period. It will examine all material covered in the course, but will emphasise the material in the second half of the course.

Supplementary Exams

The document *Important Advice for Students* states the supplementary assessment policy for the School of CSE. The following criteria will be used when considering a student for a supplementary exam:

- has the student submitted a fully documented request for Special Consideration within 3 days of the exam;
- was there medical or other evidence to support the claim that the student's performance was seriously affected? Minor ailments like a cold; a headache--unless chronic, or severe enough to require prescribed medication; feeling "unwell'', *etc* do not excuse a poor result;
- assignment and laboratory marks may not carry much weight in determining whether further assessment is warranted; and
- the student did not attend the exam, or attended the exam but was forced to leave through illness.

The document can be found on-line at:

http://www.cse.unsw.edu.au/~studentoffice/policies/yellowform.html

Please take the time to read it carefully. If you are granted a Supplementary examination, then it will be held on the date specified in the above document. If you think that you may be eligible for a supplementary exam, then make sure you are available on that day. It is your responsibility to check at the School Office for details of Supplementary examinations. Please note that there will be NO further supplementary dates for this course. In other words we will NOT be able to offer you supplementary examination at any other time.

Assessment

The assessable components of the course are:

Component	Mark
Assignment 1	5%
Assignment 2	10%
Assignment 3	5%
Lab Exercises	10%
Mid-Session Test	10%
Final Written Exam	60%

Important:

- you **cannot** pass this course unless you score at least 40% (24/60) in the final examination, regardless of how good your marks are in other parts of the course.

4. Course Resources: Textbooks, Reading Materials and useful Online Resources

Two books are prescribed for this course. To keep the cost down, we have negotiated a deal with the publishers to shrink-wrap both books into a package at a considerable discount. You will be able to use these as references after you complete the course.

Gottfried, B (2002). *Spreadsheet Tools for Engineers Using Excel.* McGraw Hill.
Shepherd, R (2004). *Excel VBA Macro Programming.* McGraw Hill.

We will provide additional references on the class web page to cover other many useful topics. It is your responsibility to study them, and in case you have any questions/problems, please contact your lecturer or tutor.

As discussed earlier, at university, the focus is on your self-directed search for knowledge. Lectures, labs, recommended reading, assignments and exams are all provided as a service to assist you in this endeavour. It is your choice as to how much work you do in this course, whether it be preparation for classes, completion of assignments, study for exams or seeking assistance or extra work to extend and clarify your understanding. You must choose the approach that best suits your learning style and goals in this course.

5. Administration

Units of Credits

6 units of credit

Pre-requisites

There are no pre-requisites for this course.

Course Web Page

http://www.cse.unsw.edu.au/~en1811

Staff

Staff Name	Role	Email	Phone (ext)
Geoff Whale	Lecturer-In-Charge	g.whale@unsw.edu.au	9385-4046 (ext 54046)
Mei Cheng Whale	Course Administrator	meicheng@cse.unsw.edu.au	9385-5683 (ext 55683)

Lecture Times

Times	Locations
Tue 2pm - 3pm	CLB-7
Thu 2pm - 4pm	CLB-7

Getting Help

From time to time, various problems may arise in your study of this course. Below is a list of typical problems, with suggestions for where you might seek help with them:

Problem	Solution
Help with problems unrelated to this course	CSE Web Help Page
Can't understand lecture material	Ask the lecturer after the lecture times, OR ask your tutor during your lab class, Or go to a consultation.
Stuck with assignments, lab work	Ask your tutor during your lab. Or go to a consultation.
Want to change lab-tute class	Email class account (en1811@cse.unsw.edu.au)
Problems with lab workstations	CSE Help Desk
Problems with your account	CSE Help Desk
Problem with Dial-Up access from home	DIS-Connect Helpdesk (9385 1777)

One final piece of **advice**. If you have a problem, **do not wait** until late in the session before you seek help. Problems that are dealt with early are usually quicker and easier to resolve than ones that are left to the last minute.

You may find the following links useful:

- CSE Help Desk: http://www.cse.unsw.edu.au/~helpdesk
- UNSW library: http://info.library.unsw.edu.au
- UNSW Learning center: http://www.lc.unsw.edu.au
- UNSW Communications unit: http://www.comms.unsw.edu.au
- Computer ergonomics: http://do.cse.unsw.edu.au/ergonomics/ergoadjust.html
- Occupational Health and Safety policies and expectations: www.riskman.unsw.edu.au/ohs/ohs.shtml
- Equity and Diversity issues: www.equity.unsw.edu.au/disabil.html

6. Plagiarism

All work submitted for assessment **must be your own work**. Lab exercises and assignments **must be completed individually**. We regard copying of assignments or lab exercises, in whole or part, as a very serious offence. **We use plagiarism detection software to search for multiply-submitted work, or work derived from other students or from other sources.** Be warned that:

- the submission of work derived from another person, or jointly written with someone else will, at the very least, result in zero marks for the assignment or lab exercise.
- allowing another student to copy from you will, at the very least, result in a reduction in the mark for your own assignment or lab exercises; and
- severe or second offences will result in automatic failure of the course, or even exclusion from the University.

Collaborative learning in the form of "think tanking" is encouraged, but students are not allowed to compose

programming solutions together as a group during such discussions. Students are also warned not to send code fragments of the assignments or labs to each other in any form (e.g. as email or listings). In addition, copying/purchasing of code that is available on the web is also not permitted. Students who are singled out during our regular plagiarism sweep will be dealt with according to School Policy: http://www.cse.unsw.edu.au/~studentoffice/policies/yellowform.html.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

> http://www.lc.unsw.edu.au/plagiarism

7. Continual course improvement

Student feedback on this course, and on the lecturing in this course, will be obtained via electronic survey at the end of session. Student feedback is taken seriously, and continual improvements are made to the course based in part on this feedback. Students are very strongly encouraged to let the lecturer in charge know of any problems, as soon as they arise. Suggestions (or even complaints!) will be listened to very openly, positively, constructively and thankfully, and every action will be taken to fix any issue or improve the students' learning experience.

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