

GNG1106
Fundamentals of Engineering Computation

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Course Description

Introduction to computer systems. Problem solving for engineering case studies. Emphasis is on the design of algorithms and their implementation for solving engineering problems using C. Introduction to Visual Basic.



Lecture Schedule/Office Hours

- Lecture Schedule
 - Tuesday, 11:30 – 13:00, TBT 333
 - Friday, 13:00– 14:30, TBT 333



Online Course material

- **Course Web Site: On Virtual Campus.**
 - Go to <http://blackboard.uottawa.ca>.
 - Enter your InfoWeb user name and password and Sign In.
 - Click on GNG1106C to access the course Virtual Campus site
 - Students are required to check the course website frequently
- **Virtual Campus/BlackBoard Learn access:**
 - Use your Infoweb userid and password
- **What you find on Virtual campus**
 - Syllabus
 - Lecture notes
 - Lab material
 - Assignment descriptions/submission
 - Grades



Textbook and Supplies

- Text (recommended, but not required)
 - **“Engineering Problem Solving with C”** Delores M. Etter, Pearson/Prentice Hall, Upper Saddle River, New Jersey, 2005
 - **“Introduction to Visual Basic 6.0”**, David I. Schneider, Pearson/Prentice Hall, Upper Saddle River, New Jersey, 2005

Available at the SFUO “Agora” bookstore, 145 Besserer St. (www.agorabookstore.ca) or University bookstore



Marking Scheme

- Midterm Examination (ME): 20%
 - Date/Time: TBD
 - Location: TBD
 - Covers everything covered so far
- Labs (Assignments, Quizzes): 30%
 - 3 to 5 Assignments
 - Online submission through virtual campus
 - Stick to deadlines; late submissions are not accepted!
 - 8 quizzes, take the best five grades
- Final Examination (FE): 50%
 - To be announced

$$MF = 0.7*FE + 0.3*ME$$

If $MF < 50$ then Final Grade = MF

Otherwise Final Grade = $0.2*ME + 0.3*Labs + 0.5*FE$

- Note: You should get at least 50% on the all the exams in order for the assignments grades will be counted. Otherwise, the assignments will not be considered.



Labs

- You will be in a room with computers available for each student, with help available from Teaching Assistants..
- Involves practical work with the C programming language and problem solving.
- You should have been assigned to one of the available lab sections, and you must attend that session each week.
 - Your lab section assignment is available via the Registration Navigator



Labs

- Regular labs will start on the week of Sept. 16
- The first lab:
 - There will be an introduction to basic concepts:
 - PCs, Windows, internet browsers
 - Includes information peculiar to our lab environment: network file storage
 - e-mail
 - virus detection,
 - How to use the Virtual Campus to submit assignments
 - Use of the “Codeblocks” environment.



Assignments

- There will be 3 to 5 assignments during the term.
- Most assignments will involve programming in C; some will involve written work.
-



Academic Integrity

- What is academic fraud?
 - Misrepresenting someone else's work as your own:
 - Failure to cite sources, including the internet and discussions.
 - Use of the words of someone else without quotation marks or other highlighting.
 - Falsified lab data or citations.
 - Violation of examination regulations.
 - Tampering with academic evaluations.
 - Helping another student do any of the above.
- Any plagiarism case will result in immediate **F** for the course!



Why is this course useful to you?

- Learn fundamental programming concepts
- Learn to design algorithms
- Practice logic thinking skills
- Learn C
- Can apply the knowledge to any other programming languages
- Useful on CV, for job applications
- Useful in future computing courses
- Useful in other projects, particularly Visual Basic part
- Programming is fun and addictive !



Will you graduate?

- Graduation rate from Engineering:
 - University of Ottawa: 62%
- Roughly 1 in every 3 people in this room will not make it!
- Failures happen mostly within the first two years. So if you survive until the end of Y2, chances are you will make it!
- What can you do to NOT be that 1 person in 3?
 - Understand the reasons for failure and avoid them.



Reasons for Failure (1/2)

- **Subject is too difficult:**
 - Get help from Professor (office hours), TAs, and if it's still difficult get a tutor.
 - If after giving it your everything (after at least a year), you still can't do it, then maybe this isn't your field.
- **Subject is too easy:**
 - Especially at the beginning, it seems that you have seen much of the material in high school already;
 - **BUT**, that's just the beginning, don't be fooled by it. Soon new material will be presented and if you aren't paying attention you will find it very difficult at exam time.



Reasons for Failure (2/2)

- **Unable to handle independence.** Some students can't handle lack of parental supervision:

Party all the time, miss classes, miss labs and assignment, etc.

Students' impression: but everybody else is doing it!

Has nothing to do with your high school average: even happens to scholarship students!

- Solution: **Need to be disciplined!**

Plan your activities

Balance studies with fun, giving more priority to the former during the semester if there is not enough time.

If you see from your midterms, assignments, labs, etc. that your marks are not where they need to be, **act early**.



A note about independence

- **Please** note that you and only you are responsible for deliverables, registration, decisions, etc.
- Unlike highschool, the University does not deal with your parents.
- For example, you can't have your parent write a medical note, or allow you to miss classes, labs, exams, etc.



Computer Facilities and Accounts



Laboratory Facilities

- The computer laboratories will be held weekly as advertised in the timetable.
 - You must attend only the lab session for which you are registered.
- The faculty computer laboratories are located in rooms STE 0110, CBY B105, B109, and B111, where an additional number of computers are located. These facilities are for general use and a computer is accessed on a first-come first-served basis.



Activating Your Computer Account

- [You must go to the faculty computing centre](#), room STE 0110 or CBY-B109 to activate your account. You will need your student number and your University of Ottawa PIN number.
- [Make sure that you do this as soon as possible!](#)
 - At least 3 days before your first scheduled activity in the laboratory to ensure that your account will be activated in time.
- [Verify that your account has been activated](#) before your first lab by trying to log on to a PC in the faculty computer laboratory.



Code::Blocks

- The environment we have chosen for C programming is called [Codeblocks](http://www.codeblocks.org). The reason for choosing this environment is related to its excellent quality, being lightweight, and its price: FREE!
- You can download the environment onto your home PC or Laptop and work on your assignments and labs with the same environment as the one you will find in the labs.
- <http://www.codeblocks.org/downloads/26>



Course Material

- Course Web Site: On Maestro <http://maestro.uottawa.ca>
 - Also known as *Virtual Campus*, *Blackboard Vista*.
- Submission of the labs is also done through Maestro.
- You must login with your *Infoweb* login and password, which you can setup here: <https://web3.uottawa.ca/infoweb/logonPage.do>



GNG 1106 Content



Course Goals

- **Computational Thinking**
 - Be able to think like a problem solving programmer.
- **Understand Code**
 - Be able to read code written by others
- **Understand Abilities And Limitations**
 - What can or cannot do with computation
- **Map Problems To Computation**
 - Take an engineering problem and convert it to computation



Content (1/2)

- **Introduction** to computers, computer languages and to C;
- **Structure of a C program**, basic I/O, Data types, arithmetic;
- **I/O functions, Logical operators, Logical expressions**;
- **Decision structures**: if, if else, and nested if/else;
- **Decision structures**: switch statement
- **Looping structures**: while, do while, for.
- **Looping structures**: Nested loops



Content (2/2)

- **Functions:** definition, and parameter passing;
- **Functions:** Basic Structured program development;
- **Arrays:** one dimensional arrays, array definition and initialization;
- **Arrays:** Multiple dimensional arrays. A case study: sorting and searching algorithms;
- **Pointers** and **addresses**;
- **Character strings** and string manipulation;
- **Structures**;
- **Files**, and file processing;
- **Visual Basic**.



Don't be Shy!

Learning method	% Retention
What you read	10%
What you hear	26%
What you see	30%
What you see and hear	50%
What you SPEAK	70%

J.E. Stice, Engineering Education, pp. 291-296, 1987



Thank You!

Ευχαριστώ

ขอบคุณ

Vielen
Dank

Tesekkürler

Merci

DMnvwd

شكراً

متشكراً

Gracias

THANK YOU

Grazie

Bedankt

Dankie

Köszönettel

Hvala

Obrigado!

شكراً

Dikey

謝謝

Asante

WAD MAHAD

SAN TAHAY

감사합니다

Urakoze

GADDA GUEY

