Computers in Engineering COMP 208

Michael A. Hawker

Fall 2007

Why Am I Here?

- It's a requirement
- You don't know it's a requirement and want to learn Fortran?
- C's awesome!
- To Have Fun

What are we Going to Study?

- The 3 Components to the Course:
  - Fortran
  - C
  - Algorithms
- We will spend ~4 weeks on each topic

FORTRAN

- One of the 1st High Level Languages
- Designed for Scientific Applications
- Updated Several Times
- Important Still to Engineering Community
- Simpler Syntax

C

- Developed in the 1970's
- Powerful and Optimized
- Widely Used Today
  - Scientific Community
  - Engineering Community
  - Business
  - Games
- Platform to learn other Languages

Algorithms

- Fundamental “Building Blocks”
  - Sorting Data
  - Searching Data
  - Mathematical Functions
    - Numerical Integration
    - Finding Roots
    - Solving Ordinary Differential Equations
    - Solving Systems of Linear Equations

Why is this Important?

- Computers Integrated into our Lives
- Gives you a Tool to Solve Problems
- Allows you to Extend or Recreate other programs with Limitations
- Can Understand other People's Code Better for Project Collaboration

What if I never Program Again?

- Programming is about Problem Solving
- Know how tools you use work
- Understand and Analysis Results better
- Learn about Limitations of Software
- Tools for science and math applications
- That just won't happen…

Course Staff

- Taught by team
  - Coordinator/lecturer
  - Other Section Lecturers
  - Number of Teach Assistants
- Lecturers will
  - Present Course Material
  - Be Available During Office Hours
- Teaching Assistants will
  - Run Tutorials
  - Be Available During Office Hours
  - Grade Assignments

Instructors

- Nathan Friedman (course coordinator)
  - friedman@cs.mcgill.ca
  - MC325, (514) 398-7076
- Michael A. Hawker (lecturer)
  - michael.hawker@mail.mcgill.ca
  - MC322, http://www.cs.mcgill.ca/~mhawke1/
- Jun Wang (lecturer)
  - jwang90@cs.mcgill.ca
  - http://www.cs.mcgill.ca/~jwang90/

Teaching Assistants

- TBD Soon…

Timetable

- Sections Held Tuesday & Thursday
- 2:30PM – 4:00PM (1430 – 1600)
  - Section 1: Prof. Friedman ENGTR0100
  - Section 2: Prof. Wang ENGMD 276
  - Section 3: Prof. Hawker MAASS 10
- Free to attend whichever lecture (mine)
- Assignments and Tests are the same

Tutorials

- Tutorial Times will be arranged
  - Fill in Survey on WebCT
  - Accommodate as many as possible
- Given by the TA's
- Not Required but is Highly Recommended
- Tutorials will Cover
  - Supplementary Material on Programming
  - Ideas for Approaching the Assignments
  - Reviewing Material for the Exams

Computing Facilities

- Faculty of Engineering Computers have all software required for the course
- Main Facilities are in
  - FDA 1
  - MDHAR G15
- Software can be downloaded from WebCT

Computers in Engineering

- Please see the course description and outline that is available (in pdf format) on WebCT (at www.mcgill.ca/webct/)
- That document was prepared by Jean-Francois Bastien, a former TA for the course.
- It will be an invaluable tool for you to use throughout the course.

Resources

- Textbook
  - FORTRAN, C and Algorithms by G. Ratzer and J. Vybihal
- WebCT resources include
  - Lecture notes
  - Code for algorithms studied in class
  - Previous midterm and final examinations
  - Solutions for previous assignments
- My Website
  - http://www.cs.mcgill.ca/~mhawke1/

Grading

- Assignments
  - 3 assignments in Fortran
  - 3 assignments in C
  - 20% of final grade
- Midterm
  - 90 Minutes During Class
  - 30% of final grade
- Final
  - 3 Hours at End of Term
  - 50% of final grade

Academic Integrity

- You are encouraged to attend tutorials to get ideas for solving the assignments
- You can discuss approaches to solving the problems
- BUT: You must code the programs yourselves and not copy from anyone else
- Copying all or portions of a program can be detected by software
- If you copy an assignment, you will receive a zero on it
- Please read the McGill Code of Student Conduct at www.mcgill.ca/integrity for the University policy on cheating and plagiarism and disciplinary procedures

How can I do well?

- Prepare for Lectures
  - Available online
  - Ask Questions!
- Attend Tutorials
  - See Examples
  - Get Pointers
  - Benefit from TA's Experience
- Go to Office Hours (I won't bite…much)

What else can I do?

- E-mail Professors or TAs
- Do Assignments on Your Own
- Look at Old Midterms, Finals, and Sample Programs

Questions So Far…