

EEE243 - Applied Computer Programming

Introduction and lesson plan

ROYAL MILITARY COLLEGE OF CANADA
ELECTRICAL & COMPUTER
ENGINEERING



GÉNIE ÉLECTRIQUE
ET GÉNIE INFORMATIQUE
COLLÈGE MILITAIRE ROYAL DU CANADA



Plan

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Introduction

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Site (Password protected):

<http://adrienlapointe.com/courses/18f/EEE243/>

– **User name:** GEF243

– **Password:** 3pi

Office hours: By appointments. Before/after the class can also be utilized.

Introduction

French Section

Instructor:

Capt Adrien Lapointe

Office : Sawyer 4106

Teaching assistant:

Karim Jahed

Introduction

- My expectations:
 - Mandatory classroom attendance * and active participation
 - Deliver your work on time
- * Unauthorized absences and delays will be penalized
- My commitments
 - Those who want to succeed will receive all my help

Course Plan

- An applied course - programming in a real environment
- Topics such as:
 - Structured Design Methodology
 - Language Structures
 - Control Statements
 - Expressions
 - C-Data Structures
 - Good design principles for programs
 - Pointers
 - Introduction to software engineering concepts

Course Plan

- Why C? I already know Python or Matlab ... at least I think I know them
- 'It's the language of choice for engineers for more than 40 years
 - 'C' compilers exist for almost all microcontrollers and other systems (known as 'universal compiler'),
 - There is a large amount of **patrimonial** code written in C.
 - A lot of work awaiting a young engineer is to do the code maintenance; not just new development.

Method of instruction

- There will be lectures and practical exercises
- You will use a **Pololu 3pi robot** in the lab to see your programs in action
 - Tangible actions and not just on-screen impressions
- Although software analysis and design is a discipline of engineering, coding has an artistic aspect
 - A solution can work without being elegant ...
- There is a competition at the end of the course!

Laboratory work

- Work in pairs
- No change of partner during the session
- You can work with a student from GEF243
- Team design and implementation
- You are responsible for managing batteries of robots
- Keep your old lab because you might need it for future work

Laboratory work

- **Good practice of coding:** Your practical work must adhere to good documentation practices, choice of variable names and "clean" code
 - There is an example on the course website
- **Other Requirements**
 - You must return your laboratory equipment before you take the final exam!
 - You will not be able to complete the final exam if all your laboratory reports are not submitted.

Laboratory work

- Timelines for Submission of Work
 - Laboratory reports will be submitted the week following the last laboratory period
 - Labs 2 to 5 require a formal report
 - RobotMania requires a description of your robot's strategy and design details
 - Late reports will receive a mark of 0%
 - All laboratories must be completed for the final exam

Marks Distribution

- Laboratories *: 25%
 - 5 ** labs during the session
- Mid-session test: 20%
 - October 20, duration 3 hours
- Final exam: 55%
- Mid-session test and final exam will have a practical portion and will contain questions about laboratories

* Do not let your lab partner do all the work

** There is no lab report for lab 1

Regulations of the Faculty of Engineering

- **You must pass the supervised individual work to pass the course**
- Your weighted average on the mid-session test and final exam must be more than 50% (37.5 / 75) to pass the course.
- Laboratory work does not count if you fail individual work

Course Resources

- Course Web Page
- Written notes (PDF slides)
 - Slides will be available the day before the course
 - Slide will not have all the information (you must be in class)
- Laboratory information will be available on the course page before the laboratory

Course Resources

- Just enough C!
- A structured Programming Approach Using C
 - Behrouz A. Forouzan & Richard F. Gilberg
- Reference Library C
 - Link C-Lib on course page

University Ethics

- You must read the RMC regulations regarding studies. Students are expected to learn from the research community and their peers. Cooperation is encouraged
- Offense - appropriate cooperation
 - Sharing Information During a Test or Review
 - Consult a colleague to solve a problem in a lab
 - Copy a colleague's design
 - Code Sharing (electronically or otherwise)
 - Helping a colleague debug code
 - Quote the ideas of another in a homework or lab
 - Passing the work of others as his own
 - Submit parts of a former assignment without mentioning the source

Qualities of graduates

RMC engineering programs are accredited by Engineers Canada. During their studies, graduates must demonstrate certain qualities that are measured by indicators.

By the end of the GEF243 course, students should be able to write a computer program to solve engineering problems, including interfacing. This quality is measured by indicator 103-1EL.

Credits

- Several people helped to build this course, I would like to thank them:
 - Capt Adrien Lapointe
 - Revised the course material for 2017
 - Capt (at the time) Mike LeSauvage
 - participated in the development of the original course and created the laboratory environment
 - Alain Beaulieu, PhD
 - developed the bulk of classroom sessions.
 - Donald McGaughey, PhD
 - Updated laboratories and classroom sessions.
 - Sylvain Leblanc, PhD and Greg Phillips, PhD
 - Updated laboratories and classroom sessions.