GEORGIA TECH LORRAINE
GEORGIA INSTITUTE OF TECHNOLOGY
School of Electrical and Computer Engineering
ECE 2036
Engineering Software Design
Spring Semester 2023

This syllabus could be adjusted before the class starts

Course objective The purpose of this course is foster the skill to write efficient and correct programs in C/C++ as needed in your career as an engineer. Students will understand how to write efficient code, and how to effectively debug code during the development process.

Course outline

- Review of C basic syntax, compilation, linking, libraries, etc.
- Defining and implementing classes, constructors, destructors etc.
- Member functions, virtual functions, pure virtual functions
- Argument passing variations (by value, by pointer, by reference)
- Managing dynamic memory (new, delete)
- Inheritance and subclassing
- Using common tools, gdb, make, gprof, valgrind, emacs etc.
- Floating Point precision and numerical analysis
- Introduction to Templates, including data structures and algorithms in the Standard Template Library
- Parallel processing and concurrency

Lectures
Two lectures per week; an assignment will be due every week (unsupervised hours).

Instructor Stéphanie ARAVECCHIA, office 220, level 2.
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Office hours The office hours will be scheduled at the beginning of the semester.

Courses prerequisite ECE 2020/2030, ECE 2025/2026[1]

Class Website https://canvas.gatech.edu/

Books, hanbooks The reference book is:
C++ How to Program, by Deitel, 10th edition, ISBN-13: 978-0-13-444823-7

Projects C/C++ assignments will use GNU C++, already installed on most Linux systems. It can also be installed on Mac OSX and Windows. It is available at: https://gcc.gnu.org/ You can choose another environment, as specified on page XXXV of the textbook.

[1] may be taken concurrently

Honor code GT Academic Honor Code is strictly enforced at GT Lorraine. Adherence to the Georgia Tech Honor Code is expected and all suspected instances of academic misconduct will be reported to the Dean of Students. It is your responsibility to ask for clarification if collaboration guidelines, test-taking policies, etc. are not clear. You will find detailed information at http://osi.gatech.edu/content/honor-code. Although students are encouraged strongly to work together to learn the course material, all students are expected to complete exams, program and complete their mbed projects individually. You MAY NOT copy code from others in any way. You MAY NOT use solutions that others have developed as the basis for your solutions. You MAY NOT use old assignments from students in previous ECE2036 classes. However, you ARE allowed to discuss the problems with fellow students in the class this semester and with the instructor. You ARE allowed to solicit and obtain help in design and debugging your solutions. You CAN show others your code and ask for advice about why it is not working or how to make it work better. But to be totally clear you MUST implement your own solution. If someone helps you, you still MUST enter every line of code of your solution personally, and you MUST fully understand every part of your submission. Students should be prepared to explain each assignment and their work when demoing selected assignments to the instructor.

Grading Your grade will be determined using the following weighting.

Attendance	10%
Mbed, C/C++ Assignments, Final Project	30%
Test #1	20%
Test #2	20%
Final Exam	20%

The tests and the exam are closed books, closed notes, no cell phone allowed. The final grade will be assigned as a letter grade according to the following scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Attendance policy Attendance will be taken at the beginning of each class. For more information about class attendance at Georgia Tech, you may go to http://www.catalog.gatech.edu/rules/4/. Student that cannot attend the class in-person should attend it online (more information at the end of this syllabus).

Student Outcomes "P" for primary indicates the outcome is a major focus of the entire course, "M" for moderate indicates the outcome is the focus of at least one component of the course, but not majority of course material.

1. (P) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
2. (M) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as weel as global, cultural, social, environmental, and economic factors;
3. (M) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Student-Faculty Expectations Agreement At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for more information.

Disabilities Georgia Tech offers accommodation to students with disabilities, this policy is extended to GT Lorraine. If you need any accommodation, then inform your instructor and Mrs Corinne Guyot with a certificate from the Office of Disability Services.

Assignments Assignments will be posted periodically on Canvas.

Schedule A tentative calendar is proposed in the following pages. It is subject to change, tests and final exams dates will be confirmed 2 weeks before.

ECE 2036 – TENTATIVE SCHEDULE SPRING 2023 – SUBJECT TO CHANGE

	LECTURE 1	LECTURE 2
WEEK #1		
Topic	Course Introduction Chapter 2 Intro C++, Input/Output, Operators	Chapter 3 C++ Intro Classes, Objects, Member Functions and Strings
Homework due		
Scheduled Evaluation		
WEEK #2		
Topic	Chapter 4 Control Statements Part 1	Chapter 5 Control Statements Part 2
Homework due		Assignment 1: IDE, Example Code, first program 2.16, and Problem 3.10 Creating a Class
Scheduled Evaluation		
WEEK #3		
Topic	Chapter 6 Functions and Recursion	Chapter 6 Functions and Recursion Chapter 7 Arrays and Vectors
Homework due		Assignment 2: Problem 4.28 Pseudocode, debugging, control statements
Scheduled Evaluation		
WEEK #4		
Topic	Chapter 7 Arrays and Vectors	Chapter 7 Arrays and Vectors, Debugging Chapter 8 Pointers
Homework due		Assignment 3: Problem 6.33 Coin Toss Statistics using Random Numbers
Scheduled Evaluation		
WEEK #5		
Topic	Chapter 8 Pointers Chapter 9 Classes: A deeper Look	Chapter 9 Classes: A deeper Look
Homework due		Assignment 4: Matrix Calculator Using Arrays
Scheduled Evaluation		
WEEK #6		
Topic	Chapter 9 Classes: A deeper Look Chapter 10 Operator Overloading	Chapter 10 Operator Overloading
Homework due		Assignment 5: Problem 8.12 Pointer-based pass by reference
Scheduled Evaluation		
	GTL RECESS	GTL RECESS
WEEK #7		
Topic	MBED Chapter 11 Inheritance	
Homework due		Assignment 6: Problem 10.8 Operator overloading
Scheduled Evaluation		Test #1

	LECTURE 1	LECTURE 2
WEEK #8		
Topic	Chapter 12 Polymorphism	MBED
Homework due		Assignment 7: MBED #1
Scheduled Evaluation		
WEEK #9		
Topic	Chapter 13 Stream I/O	MBED Chapter 14 File Processing
Homework due		Assignment 8: MBED #1
Scheduled Evaluation		
WEEK #10		
Topic	Chapter 15 Standard Library Containers and Iterators	Chapter 21 String and String Stream Processing
Homework due		Assignment 9: Polymorphism
Scheduled Evaluation		
WEEK #11		
Topic	Chapter 16 Standard Library Algorithms	Chapter 18 Introduction to Custom Templates
Homework due		Assignment 10: File I/O
Scheduled Evaluation		
WEEK #12		
Topic		Chapter 19 Custom Templatized Data Structures
Homework due		
Scheduled Evaluation	Test #2	
WEEK #13		
Topic	Chapter 19 Custom Templatized Data Structures	Chapter 22 (22.5, only BITS)
Homework due	Final Project Part 1	
Scheduled Evaluation		
WEEK #14		
Topic	No class	
Homework due	Final Project Part 2	
Scheduled Evaluation		
FINALS WEEK		
Topic		
Homework due		
Scheduled Evaluation		Final Exam (to be scheduled)