CS292/CMPE291 Course Outline
Advanced Programming Techniques

Description:
This course teaches advanced programming techniques to those who have learnt basic programming concepts and are ready to learn in-depth programming. It focuses on object-oriented programming using C++. The main concepts discussed are: Objects, Data Abstraction, Data Encapsulation, Polymorphism, and Inheritance. We teach the C++ language constructs that are used to implement these concepts. For example, Classes, Overloaded Operators, Overridden Methods, Friend Functions, Virtual Functions, and Templates, etc.

Goals:
- Become familiar with breaking down a problem into objects rather than procedures
- Learn object-oriented programming in C++
- Learn what is available off the shelf to facilitate C++ development (tools, libraries)

Prerequisites:
1. Proficiency in C at the level of CS192.

Talk to the instructor if you are not sure whether you have the right background for this course.

Detailed Contents:
1. Why C++?
2. OOP Overview
3. Classes
4. Members
5. Procedures versus Objects
6. E1\(^1\) given

\(^1\)E1 stands for Exercise 1.
7. Class Design
8. Data Modeling
9. PA1\(^2\) given
10. E2 given
11. Introductory STL
12. iterators and containers
13. Overloading
14. E3 given
15. Inheritance
16. PA2 given
17. E4 given
18. Midterm
19. Virtual Methods
20. Abstract classes
21. Destruction and Polymorphism
22. E5 givenStream I/O in C++
23. PA3 given
24. Templates
25. STL Details
26. E6 given
27. Exception Handling

\(^2\)PA1 stands for Programming Assignment 1.