ESE 344 SOFTWARE TECHNIQUES FOR ENGINEERS
Stony Brook University, ECE, Prof. Murali Subbarao
Credits 3, Prerequisites: ESE 218; ESE 224 or CSE 230.
(Subject to minor revision)

Course description:
Trains students to use computer systems to solve engineering problems. It covers: C++ programming language, UNIX programming environment, basic data structures and algorithms, and object oriented programming.

Text books:
1. Datastructures and Program Design in C++,
   R. L. Kruse and A. J. Ryba, Prentice-Hall, Inc., 1999, ISBN 0-13-768995-0
2. C++ by Dissection, Ira Pohl, Addison-Wesley, 2002, 0-201-74396-5 (pbk)
   Visual C++ tutorial handout

References:
1. Algorithms in C++, Parts 1-4, R. Sedgewick, Addison-Wesley, ISBN 0-201-35088-2
2. Algorithms in C++, Part 5, R. Sedgewick, Addison-Wesley, ISBN 0-201-36118-3
3. Any indroductory book on UNIX, e.g. online tutorial or class handout.

Contact info:
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Office Hours: Tue. and Thu.: 10 a.m to 11.00 a.m. and 1 pm to 2 pm.
Place: Room 233, Light Engg. Bldg.

Syllabus:

Part I: Datastructures and Algorithms
1. Arrays
2. Stacks and Queues
3. Linked lists
4. Trees
5. Graphs
6. Recursion
7. Searching and sorting

Part II. The C++ Programming Language
1. Introduction and overview
2. Native types and statements
3. Functions, Pointers, and Arrays
4. Classes and Abstract Data Types
5. Constructors, Destructors, and Operator overloading
6. Templates and Generic Programming
7. Standard Template Library
9. Inheritance and Object Oriented Programming
10. Input and output

Part III. UNIX Operating System

1. Introduction
2. File system
3. Using Shell

This course will have about four programming projects in C++. On average, a student may have to spend about 9 hours per week on this course.

GRADING

Part I: Assignments
Programming projects : 35 %
Homeworks/Quizzes: 15 %

Part II : Tests
Test 1: 1 hr. 15 mins. : 17 %
Test 2: 1 hr. 15 mins. : 17 %
Test 3 (Final) : 1 hr. 15 mins.: 16%

Late submission policy: Projects submitted 1 to 2 days late will be graded out of 75% of the maximum. Homeworks are not accepted late as each homework carries a very small weight.

Grading Policy

In the written tests part, out of a maximum of 50 points, you must get at least 25 points to pass the course. Final grades are assigned based on absolute percentage of total marks as below.

A : 91—100 , A- : 86—90 , B+ : 81—85, B : 76—80, B- : 71--75
C+ : 68—70, C : 64—67, C- : 61—63, D+ : 56—60, D : 51—55, F : 0--50

Goals: Teach basic software techniques, data structures, and algorithms, using the C++ programming language useful in electrical and computer engineering applications.

Objectives:
Students should understand and implement the following:

i. basic data structures including arrays, stacks, queues, linked lists, binary trees, trees, and graphs;
ii. basic algorithms for manipulating the data structures above;
iii. simple searching and sorting algorithms;
iv. C++ programming language features; and
v. simple UNIX shell programs.