COEN 70

Formal Specification and Advanced Data Structures

Spring 2017

Course time / location

MWF 11:45 am – 12:50 pm
ENGR 106

Course Objectives

- Use a formal specification language to define ADTs
- Use structural induction as the basis for inductive definition of recursively defined functions and data structures
- Develop programs that implement ADTs while meeting a specification
- Develop programs using pair-wise programming
- Implement simple container data types and data structures, and realize the implementation differences between structures as values versus objects
- Implement advanced data structures

Prerequisites

A grade of C- or better in either COEN 12 or CSCI 61 and in either COEN 19 or MATH 51. Co-requisite: COEN 70L

Instructor

Dr. Hayang Kim (hykim@scu.edu)

Office hours

W/F 1:00 pm – 2:00 pm, and by appointment
ENGR 323H

Text

Main & Savitch, Data Structures and Other Objects Using C++, 4th ed

Quiz

Every Friday, in-class

Exam

Midterm 1: Friday, Apr. 28, in-class
Midterm 2: Friday, May 26, in-class

Final Exam: TBA

Exam Policy

No books, No internet capable devices
Makeup tests are allowed only with proof of emergency

Grading

Quizzes	20%
Midterm 1	20%
Midterm 2	20%
Final exam	40%

Topics

- The Phases of Software Development and Program Analysis
- Abstract Data Types and C++ Classes
- Container Classes
- Pointers and Dynamic Arrays
- Linked Lists
- Templates and Iterators
- Stacks
- Queues
- Trees
- Balanced Trees
- Derived Classes and Inheritance