CmpE 250 Data Structures and Algorithms

Instructor	H. Birkan YILMAZ (birkan.yilmaz@boun.edu.tr)
Teaching Assistants	Rıza Özçelik Student Assistants TBA
Class Hours **PS Hours**	MMW 566 (Online) TBA
Course Website	moodle.boun.edu.tr
Textbook	M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley, Fourth Edition.
Reference Books	Jon Kleinberg, Eva Tardos. Algorithm Design. Addison Wesley, 2006
Goals	This course is designed to teach a) the analysis of advanced data structures and algorithms, b) their implementation using C++ programming language with object oriented programming concepts.

Prerequisites by topic

- Fluency with the implementation of basic data structures
- Course with coverage of most of the following topics
  - Object oriented programming concepts
  - List implementations using arrays and objects,
  - Doubly linked lists, Circular lists, Stack, and Queue Implementation
  - General tree structure; Binary trees; AVL trees; B-Trees

Tentative Outline
Week 1 : Introduction to C/C++ Programming
Week 2 : Basic Data Structures & STL
Week 3 : Introduction to Algorithm Analysis
Week 4 : Hashing
Week 5 : Priority Queues
Week 6 : Sorting (*Quiz)
Week 7 : Graph Basics & Directed Acyclic Graphs (Topological Sort)
Week 8 : Traversing & Searching on Graphs
Week 9 : Spanning Trees
Week 10: Disjoint Sets & Union/Find Algorithms (*Quiz)
Week 11: Network Flows
Week 12: Algorithm Design Techniques
Week 13: Examples of Dynamic Programming & Randomized Algorithms

Basis for evaluation

1 Midterm exam	15 %
2 Quizzes on 6th and 10th weeks + 2 **pop** quizzes	20 %
5 Projects	40 %
Final exam	25 %
Total	100 %
	A change of +- 5% may occur in the basis of evaluation!

Important: **Projects and homeworks** assigned in this course are essential for passing the course. If you fail to submit on time, you will also fail the course!

Adapted by H. Birkan YILMAZ based on a version by Ali Taylan Cemgil & Ali Akkaya.