

IE 201 Intermediate Programming

Instructor: Ali Tamer Ünal, M 4115. **TA:** Melis Teksan, MMS Lab.

Fall 2009

Objective:

The main purpose of this course is to present intermediate programming techniques including basic data structures (arrays, lists, etc.) and fundamental algorithms (sorting, searching, etc.). A major emphasis will be given to object-oriented (O-O) programming in C++ language, in relation to O-O Design and O-O Analysis.

References:

Mark Allen Weiss. 2003. 2nd Edition. *Data Structures & algorithm Analysis in C++*. Addison Wesley.

Stroustrup Bjarne. 1993. 2nd Edition. *The C++ Programming Language*. Addison Wesley.

Outline:

Week	Topic	Subject
1	Introduction	<i>Basics</i>
		<i>Flow control</i>
		<i>Functions</i>
		<i>C++ program structure</i>
2	Structures	<i>Struct</i>
		<i>Class</i>
		<i>Data hiding</i>
2	Constructors and Destructors	
3	Pointers 1	<i>Memory allocation</i>
4*	Object oriented analysis design 1	<i>Concepts</i>
		<i>UML 1</i>
5	Pointers 2	<i>Arrays</i>
		<i>Multidimensional arrays</i>
		<i>Strings</i>
5	References	<i>C++ reference</i>
		<i>Call by reference / value</i>
6	Polymorphism	<i>Inheritance</i>
		<i>Function override</i>
7		<i>Abstract classes</i>
7	Object oriented analysis design 2	<i>UML 2</i>
8	Operator overloading	
8	Templates	
8*	STL	
8	Streams	<i>Basics</i>
		<i>File operations</i>
9	Algorithms 1	<i>Algorithm analysis</i>
		<i>Recursion</i>
9	Data structures	<i>Arrays</i>
		<i>Lists</i>
		<i>Trees</i>
10		<i>B-Trees</i>
		<i>Hash Table</i>
11*	Algorithms 2	<i>Sorting</i>

Project:

Preparing a term project will constitute a major portion of the expected course work. Teams of at least 3 students will be responsible of

- writing a proposal to develop a software in C++,
- writing an analysis report,
- writing a design report,
- and finally, developing the software and the appropriate user documentation.

Grading:

Homeworks	10%
Midterm	20%
Project	40%
Final	30%