IS 579B – Autumn 2000

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Office Hours: M, W 11:30-1:30 and by appointment
Text: *Java: First Contact*, Garside & Mariani, Course Technology.

Course Description. This course is designed to help you gain an understanding of the object-oriented approach to developing and programming computer systems. The course will cover the following topics:

- Programming using Java and Visual Café
- Object-oriented programming concepts
- Object-oriented design approaches

Object-oriented programming is a different programming paradigm compared to traditional, non object-oriented languages. It is not simply a few new features added to a programming language — it is a different way of thinking about and developing a programming solution to a problem. The process identifies classes that represent both data and behavior that the class can exhibit. Objects are created using class definitions. These objects are sent messages and they respond to these messages by exhibiting behavior. In addition, classes are members of a class hierarchy that allows a class to inherit the data and behavior of its ancestors in the hierarchy.

Java is both object oriented and rich in modern programming features. It supports the construction of platform independent applications (the focus of this course), "applets" that can be embedded in web pages, as well as server-side code (java server pages and Servlets).

Programming is often described as an "art" as well as a science. The following quotation from Fredrick P. Brooks, Jr. in his book titled *The Mythical Man-Month: Essays on Software Engineering* does an excellent job of describing this art.

"The programmer, like the poet, works only slightly removed from pure thought-stuff. He builds his castles in the air, from air, creating by exertion of the imagination. … Yet the program construct, unlike the poet's words, is real in the sense that it moves and works, producing visible outputs separate from the construct itself. It prints results, draws pictures, produces sounds, moves arms. The magic of myth and legend has come true in our time. One types the correct incantation on a keyboard, and a display screen comes to life, showing things that never were nor could be."

The course uses Visual Café from WebGain — an object-oriented programming environment for Java. This is a sophisticated and powerful system that provides an environment to facilitate the construction of event-driven systems with power graphical user interfaces.

Requirements. The course requires that you complete six programming assignments and two exams. The six assignments give you an opportunity to demonstrate your understanding of the programming concepts. The exams provide feedback on how well you understand the course topics. The assignments count for 40% of your grade, the exams 30% each. Be aware that much of the material covered in lecture is not covered elsewhere (including the textbook).

Course Schedule

Date	Topics	Readings*	Assignments
9/26 Session 1	Introduction to Object-Oriented Concepts	Ch 1 & 2	
9/28 Session 2	Declaring Objects and Calling Methods; Introduction to Visual Café	Ch 3	
10/3 Session 3	Visual Café and Simple Programs		
10/5 Session 4	Basic Java Data Types	Ch 6	**Assignment 1**
10/10 Session 5	Selection	Ch 4	
10/12 Session 6	Selection (continued)		**Assignment 2**
10/17 Session 7	Repetition	Ch 5	
10/19 Session 8	Repetition (continued)		
10/24 Session 9	Midterm		**Assignment 3**
10/26 Session 10	Creating Classes	Ch 7	
10/31 Session 11	Creating Methods	Ch 8	
11/2 Session 12	Arrays, Vectors and Hashtables	Ch 9, Section 21.1	
11/7 Session 13	Class Design – Composite Objects	Ch 10	**Assignment 4**
11/9 Session 14	Class Design – Inheritance	Ch 11	
11/14 Session 15	Class Design – Polymorphism	Ch 13	
11/16 Session 16	Class Design – Abstract Classes and Interfaces	Ch 14	
11/21 Session 17	Exception Handling and Object Serialization	Ch 15	**Assignment 5**
11/23	Thanksgiving		
11/28 Session 18	Using Databases	JDBC URL link	
11/30 Session 19	Using Databases (continued)		
12/5 Session 20	Final Exam		**Assignment 6**

*All readings are from Java: First Contact

JDBC URL link:
http://developer.java.sun.com/developer/onlineTraining/Database/JDBCShortCourse/jdbc/jdbc.html