

# **Mercer County Community College**

## **Division of Business and Technology**

### **IST 239**

## **ADVANCED JAVA PROGRAMMING**

### **COURSE DESCRIPTION**

Advanced topics using Java programming language. Applications using multi-threading, distributed computing, database access, network communication and Web development are created. Current topics relevant to enterprise level development as well as application design best practices are discussed.

Text (s):

Recommended Supplementary Texts From The Library:

Prerequisite: **IST 237**

Co-requisites: **None**

Credits: **4**

Lecture Hours: **3**

Laboratory Hours: **2**

**Food and drink are strictly prohibited in classrooms as per health and safety laws. Students may not bring in chemicals or cleaning fluids without the appropriate MSD sheets.**

**Course Coordinator: Winston H. Maddox**

**Revised: Fall 2003**

---

## **I. COURSE OUTLINE**

The course is designed to acquaint students with advanced application development skills using Java standard and enterprise level development frameworks. Topics include: Applications using multi-threading, distributed computing, database access, network communications and Web development using Java. Current relevant topics as well as application design and best practices are discussed.

## **II. COURSE OBJECTIVES**

Upon completion of this course students will be able to:

1. Demonstrate best practice design principles using Java
2. Code and execute standard and enterprise level applications that involve client and server side(including Web) development
3. Discuss current topics in regard to Java development.

## **III. TESTS/ QUIZZES**

Three quizzes/exams will be given during the course. Each quiz/exam will consist of multiple answer, multiple choice and true/false questions.

## **IV. LABORATORY**

Students will be given a minimum of five (5) labs/homework assignments as well as five (5) in class exercises. In addition, one major project will be assigned during the second half of the semester. All assignments will have deadlines.

## **V. LABORATORY EVALUATION**

All points issued are contingent upon the student being able to demonstrate understanding of the code they wrote for each lab when questioned by the instructor. Students' performance of each laboratory assignment will be evaluated and assigned a point value according to their explanation, implementation and demonstration of the following:

<b>Standards</b>	<b>0 to 2 points</b> Adherence to specific programming standards, including the demonstration of appropriate application design
<b>Remarks</b>	<b>0 to 2 point</b> Class files must contain properly commented code using JavaDocs standard
<b>Use of Technology</b>	<b>0 to 2 points</b> The Java technology that the lab involves must be used in a technically correct manner.
<b>Execution</b>	<b>0 to 4 points</b> Output must be according to the project's specifications.
<b>Total each project</b>	<b>0 to 10 points</b>

## **VI. FINAL GRADE**

The final grade is a composite based upon:

Tests (Theory/projects/both)	30%
Laboratory Major Projects (class)	20%
Midterm Examination	25%
Final Examination	25%

## Course Outline

Week	Lecture Topics	Reading Assignment and Projects
	<b>Standard and Enterprise Java API</b>	
One	<ul style="list-style-type: none"> <li>• Review of Object Oriented Development using Java</li> <li>• Installation of J2SE, J2EE and Additional APIs</li> <li>• Discussion of Enterprise Level Applications</li> </ul>	Chapter 1 In Class Exercise
	<b>Documentation in Java</b>	
	<ul style="list-style-type: none"> <li>• Use of JavaDocs</li> <li>• Tags</li> <li>• Generation of HTML documentation using JavaDocs</li> </ul>	
Two	<b>Multithreading</b> <ul style="list-style-type: none"> <li>• Design Considerations for Using Multithreading</li> <li>• Extending the Thread Class and Creating Threads</li> <li>• Implementing the Runnable Interface</li> <li>• Synchronization</li> <li>• Blocking</li> <li>• Deadlock</li> </ul>	Chapter 2 In Class Exercise
Three	<b>Collections Framework and java.util Package</b> <ul style="list-style-type: none"> <li>• Managing Collections of Items</li> <li>• The Collections Framework Interface</li> <li>• Concrete Implementations Within the Framework</li> <li>• Legacy Classes</li> <li>• Collections Utility Classes</li> </ul> <b>Cloning Using Java</b> <ul style="list-style-type: none"> <li>• Maker interface</li> <li>• Considerations When Cloning Objects</li> </ul>	Chapter 3 Lab 1
Four	<b>Networking using Java</b> <ul style="list-style-type: none"> <li>• TCP and UDP</li> <li>• Communications Using Lower Level Networking Classes</li> <li>• HTTP</li> <li>• Accessing Web Pages Using Higher Level Networking Classes</li> </ul>	Chapter 4 Lab 2
Five	<b>Advanced JDBC Topics</b> <ul style="list-style-type: none"> <li>• JDBC Review</li> <li>• SQL Review</li> <li>• Using Scrollable and Updateable Result sets</li> <li>• Statements</li> <li>• Prepared Statements</li> <li>• Using Callable Statements for Stored Procedures</li> <li>• Meta Data</li> </ul>	Chapter 5 Quiz 1 Lab 3
Six	<b>RMI</b> <ul style="list-style-type: none"> <li>• Remote Method Invocation</li> <li>• Marshalling Parameters</li> <li>• Creating a Sub using RMIC</li> <li>• Starting a Server Program</li> <li>• Connection to remote Objects</li> <li>• Deployment</li> </ul>	Chapter 6 In Class Exercise

<b>Week</b>	<b>Lecture Topics</b>	<b>Reading Assignment and Projects</b>
Seven	<b>The JavaBeans Specifications</b> <ul style="list-style-type: none"> <li>• The JavaBeans Specification</li> <li>• The BeanBox and Bean Builder</li> <li>• Naming Patters</li> <li>• Bean Properties and Events</li> </ul>	Chapter 7 Lab 4
Eight	<b>Servlets and Web Development Part I</b> <ul style="list-style-type: none"> <li>• Web Application Development Challenges</li> <li>• Servlets</li> <li>• The HTTP Request Interface</li> </ul>	Chapter 8
Nine	<b>Servelts and Web development Part II</b> <ul style="list-style-type: none"> <li>• Managing User Sessions Using Cookies</li> <li>• Managing User Sessions Using the Session Interface</li> <li>• WAR files and deployment</li> </ul>	Chapter 9
Ten	<b>JSP</b> <ul style="list-style-type: none"> <li>• Java Server Pages</li> <li>• JSP Lifecycle</li> <li>• Directives</li> <li>• Predefined Objects</li> <li>• Accessing JavaBeans</li> <li>• Tag Libraries and Custom Tags</li> </ul>	Chapter 10 Online Tutorial Major Project
Eleven	<b>Introduction to XML</b> <ul style="list-style-type: none"> <li>• XML vs. HTML</li> <li>• Document Structure</li> <li>• Well Formed vs. Valid Documents</li> <li>• DTDs</li> <li>• Namespaces</li> </ul>	Chapter 11 Quiz 2
Twelve	<b>Parsing XML using ASX and DOM</b> <ul style="list-style-type: none"> <li>• Parsers</li> <li>• Tradeoffs of SAX vs. Dom</li> <li>• Determining Structure Using SAX</li> <li>• Accessing Document Structure Using DOM</li> <li>• Creating and Modifying Documents using DOM</li> </ul>	Chapter 12 Online Tutorial Lab 5
Thirteen	<b>JDOM, JaxP and XSLT</b> <ul style="list-style-type: none"> <li>• Why JDOM?</li> <li>• Accessing, Modifying and Creating Documents using JDOM</li> <li>• Abstracting Parsers using JaxP</li> <li>• XSL and XSLT</li> </ul>	Chapter 13 Online Tutorial In Class Exercise
Fourteen	<b>Design Patters</b> <ul style="list-style-type: none"> <li>• Definition and Use of Design Patters</li> <li>• Brief Overview of UML</li> <li>• Design Patters Examples</li> <li>• Examples of Design Patters Within the J2SE and J3EE SDKs</li> </ul>	Chapter 14 Online Tutorial In Class Exercise
Fifteen	<b>Current Topics Within Java</b> <ul style="list-style-type: none"> <li>• Topics and APIs Currently of Interest Within the Java Community :</li> <li>• EJB Overview</li> <li>• Web Services</li> </ul>	Online Tutorial Quiz 3

### **Academic Integrity Statement**

“A student who a.) knowingly represents work of others as his/her own; b.) uses or obtains unauthorized assistance in the execution of any work; or c.) gives fraudulent assistance to another student is guilty of cheating. Violators will be penalized.” (Student Handbook)

### **Classroom Conduct Statement**

It is the students’ responsibility to attend all of their classes. If they miss a class meeting for any reason, students are responsible for all content that is covered, for announcements made in their absence, and for acquiring any materials that may have been distributed in class. It is expected that students be on time for all their classes. If students walk into a class after it had begun, it is expected that they choose a seat close to where they entered the room so they do not disrupt the class meeting.

Students are expected to follow ordinary rules of courtesy during class session. Engaging in private, side conversations during class time is distracting to other students and to the instructor. Leaving class early without having informed the instructor prior to class is not appropriate. Unless there is an emergency, leaving class and returning while class is in session is not acceptable behavior. Disruptive behavior of any type, including sharpening pencils during class while someone is speaking, is not appropriate.

The college welcomes all students into an environment that creates a sense of community and pride and respect; we are all here to work cooperatively and to learn together.