

Java Programming I

11722 - CSC* K223 - T01

**Three Rivers Community-Technical College
Norwich, CT 06360**

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Office Hours by appointment only

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Course Description

This course introduces intermediate skill for web site developments. It will :

1. Concentrate on using non-proprietary tool sets to implement these skills.
2. Cover the rudimentary processes for client and server side processing. Beginner programming concepts will be introduced.
3. Introduce the different data and behavioral models associated with client side processing
4. Java Server Pages will be used for server side processing where possible
5. Cover Dynamic HTML
6. Present server database processing, with PHP and Ajax, MySql

Method of Evaluation

1. Homework Assignments (basic completeness plus student enhancements)
2. Class Participation, individual initiative and assistance to other classmates.

Exam Make ups

N/A

Attendance

Classes will be held in room 218 at Three Rivers College. Attendance requirements will be discussed at the first class.

Required Text

JAVA : How To Program
Deitel
Eighth Edition
ISBN 13 : 978-0-13-605306-4
ISBN 10 : 0-13-605306-8

Reminder

Bring the CD provided with your book to class.
All Students are required to have a portable drive.

Course Outline with Assignments

This course is designed to provide the student with the fundamentals of object oriented programming using the language of JAVA. Topics include applets, applications, inheritance, polymorphism, GUI components, event handling, graphics, multi-threading, exception handling, multi-media, file I/O, and networking. Three lecture hours, one two-hour lab.

Chapter 1

- 1.1 Introduction
 - 1.2 Computers: Hardware and Software
 - 1.3 Computer Organization
 - 1.4 Early Operating Systems
 - 1.5 Personal, Distributed and Client/Server Computing
 - 1.6 The Internet and the World Wide Web
 - 1.7 Machine Languages, Assembly Languages and High-Level Languages
 - 1.8 History of C and C++
 - 1.9 History of Java
 - 1.10 Java Class Libraries
 - 1.11 Fortran, COBOL, Pascal and Ada
 - 1.12 BASIC, Visual Basic, Visual C++, C# and .NET
 - 1.13 Typical Java Development Environment
 - 1.14 Notes about Java and *Java How to Program, Eighth Edition*
 - 1.15 Test-Driving a Java Application
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- 1.16 Software Engineering Case Study: Introduction to Object Technology and the UML
 - 1.17 Web 2.0
 - 1.18 Software Technologies
 - 1.19 Wrap-Up
 - 1.20 Web Resources

Assignments

- 1.4
- 1.5
- 1.6
- 1.7
- 1.8
- 1.9
- 1.10

Chapter 2

- 2.1 Introduction
- 2.2 Our First Program in Java: Printing a Line of Text
- 2.3 Modifying Our First Java Program
- 2.4 Displaying Text with `printf`
- 2.5 Another Application: Adding Integers
- 2.6 Memory Concepts
- 2.7 Arithmetic
- 2.8 Decision Making: Equality and Relational Operators
- 2.9 Wrap-Up

Assignments

- 2.7
- 2.8
- 2.9
- 2.10
- 2.11
- 2.12
- 2.13
- 2.30

Chapter 3

- 3.1 Introduction
- 3.2 Classes, Objects, Methods and Instance Variables
- 3.3 Declaring a Class with a Method and Instantiating an Object of a Class
- 3.4 Declaring a Method with a Parameter
- 3.5 Instance Variables, *set* Methods and *get* Methods
- 3.6 Primitive Types vs. Reference Types
- 3.7 Initializing Objects with Constructors
- 3.8 Floating-Point Numbers and Type `double`
- 3.9 (Optional) GUI and Graphics Case Study: Using Dialog Boxes
- 3.10 Wrap-Up

Assignments

- 3.5
- 3.6
- 3.7
- 3.8
- 3.9
- 3.10
- 3.14

Chapter 4

- 4.1 Introduction
- 4.2 Algorithms
- 4.3 Pseudocode
- 4.4 Control Structures
- 4.5 `if` Single-Selection Statement
- 4.6 `if...else` Double-Selection Statement
- 4.7 `while` Repetition Statement
- 4.8 Formulating Algorithms: Counter-Controlled Repetition
- 4.9 Formulating Algorithms: Sentinel-Controlled Repetition
- 4.10 Formulating Algorithms: Nested Control Statements
- 4.11 Compound Assignment Operators
- 4.12 Increment and Decrement Operators
- 4.13 Primitive Types
- 4.14 (Optional) GUI and Graphics Case Study: Creating Simple Drawings
- 4.15 Wrap-Up

Assignments

- 4.10
- 4.11
- 4.12
- 4.13
- 4.14
- 4.15
- 4.16
- 4.20

Chapter 5

- 5.1 Introduction
- 5.2 Essentials of Counter-Controlled Repetition
- 5.3 `for` Repetition Statement
- 5.4 Examples Using the `for` Statement
- 5.5 `do...while` Repetition Statement
- 5.6 `switch` Multiple-Selection Statement
- 5.7 `break` and `continue` Statements
- 5.8 Logical Operators
- 5.9 Structured Programming Summary
- 5.10 (Optional) GUI and Graphics Case Study: Drawing Rectangles and Ovals
- 5.11 Wrap-Up

Assignments

- 5.5
- 5.6
- 5.7
- 5.8
- 5.9
- 5.10
- 5.15

Chapter 6

- 6.1 Introduction
- 6.2 Program Modules in Java
- 6.3 `static` Methods, `static` Fields and Class `Math`
- 6.4 Declaring Methods with Multiple Parameters
- 6.5 Notes on Declaring and Using Methods
- 6.6 Method-Call Stack and Activation Records
- 6.7 Argument Promotion and Casting
- 6.8 Java API Packages
- 6.9 Case Study: Random-Number Generation
 - 6.9.1 Generalized Scaling and Shifting of Random Numbers
 - 6.9.2 Random-Number Repeatability for Testing and Debugging
- 6.10 Case Study: A Game of Chance; Introducing Enumerations
- 6.11 Scope of Declarations
- 6.12 Method Overloading
- 6.13 (Optional) GUI and Graphics Case Study: Colors and Filled Shapes
- 6.14 Wrap-Up

Assignments

- 6.22

Chapter 7

- 7.1 Introduction
- 7.2 Arrays
- 7.3 Declaring and Creating Arrays
- 7.4 Examples Using Arrays
- 7.5 Case Study: Card Shuffling and Dealing Simulation
- 7.6 Enhanced `for` Statement
- 7.7 Passing Arrays to Methods
- 7.8 Case Study: Class `GradeBook` Using an Array to Store Grades
- 7.9 Multidimensional Arrays
- 7.10 Case Study: Class `GradeBook` Using a Two-Dimensional Array
- 7.11 Variable-Length Argument Lists
- 7.12 Using Command-Line Arguments
- 7.13 Class Arrays
- 7.14 Introduction to Collections and Class `ArrayList`
- 7.15 (Optional) GUI and Graphics Case Study: Drawing Arcs
- 7.16 Wrap-Up

Assignments

- 7.6
- 7.7
- 7.8
- 7.9
- 7.17

Chapter 8

- 8.1 Introduction
- 8.2 `Time` Class Case Study
- 8.3 Controlling Access to Members
- 8.4 Referring to the Current Object's Members with the `this` Reference
- 8.5 `Time` Class Case Study: Overloaded Constructors
- 8.6 Default and No-Argument Constructors
- 8.7 Notes on `Set` and `Get` Methods
- 8.8 Composition
- 8.9 Enumerations
- 8.10 Garbage Collection and Method `finalize`
- 8.11 `static` Class Members
- 8.12 `static` Import
- 8.13 `final` Instance Variables
- 8.14 `Time` Class Case Study: Creating Packages
- 8.15 Package Access
- 8.16 (Optional) GUI and Graphics Case Study: Using Objects with Graphics
- 8.17 Wrap-Up

Assignments

- 8.2
- 8.3
- 8.13

Chapter 9

- 9.1 Introduction
- 9.2 Superclasses and Subclasses
- 9.3 `protected` Members
- 9.4 Relationship between Superclasses and Subclasses
 - 9.4.1 Creating and Using a `CommissionEmployee` Class
 - 9.4.2 Creating and Using a `BasePlusCommissionEmployee` Class
 - 9.4.3 Creating a `CommissionEmployee–BasePlusCommissionEmployee` Inheritance Hierarchy
 - 9.4.4 `CommissionEmployee–BasePlusCommissionEmployee` Inheritance Hierarchy Using `protected` Instance Variables
 - 9.4.5 `CommissionEmployee–BasePlusCommissionEmployee` Inheritance Hierarchy Using `private` Instance Variables
- 9.5 Constructors in Subclasses
- 9.6 Software Engineering with Inheritance
- 9.7 `Object` Class
- 9.8 (Optional) GUI and Graphics Case Study: Displaying Text and Images Using `Labels`
- 9.9 Wrap-Up

Assignments

9.5

Chapter 10

- 10.1** Introduction
- 10.2** Polymorphism Examples
- 10.3** Demonstrating Polymorphic Behavior
- 10.4** Abstract Classes and Methods
- 10.5** Case Study: Payroll System Using Polymorphism
 - 10.5.1 Abstract Superclass `Employee`
 - 10.5.2 Concrete Subclass `SalariedEmployee`
 - 10.5.3 Concrete Subclass `HourlyEmployee`
 - 10.5.4 Concrete Subclass `CommissionEmployee`
 - 10.5.5 Indirect Concrete Subclass `BasePlusCommissionEmployee`
 - 10.5.6 Polymorphic Processing, Operator `instanceof` and Downcasting
 - 10.5.7 Summary of the Allowed Assignments Between Super and Subclass Variables
- 10.6** `final` Methods and Classes
- 10.7** Case Study: Creating and Using Interfaces
 - 10.7.1 Developing a `Payable` Hierarchy
 - 10.7.2 Interface `Payable`
 - 10.7.3 Class `Invoice`
 - 10.7.4 Modifying Class `Employee` to Implement Interface `Payable`
 - 10.7.5 Modifying Class `SalariedEmployee` for Use in the `Payable` Hierarchy
 - 10.7.6 Using Interface `Payable` to Process `Invoices` and `Employees` Polymorphically
 - 10.7.7 Common Interfaces of the Java API
- 10.8** (Optional) GUI and Graphics Case Study: Drawing with Polymorphism
- 10.9** Wrap-Up

Assignments

- 10.3
- 10.4
- 10.5
- 10.6
- 10.7
- 10.11

Chapter 11

- 11.1** Introduction
- 11.2** Error-Handling Overview
- 11.3** Example: Divide by Zero without Exception Handling
- 11.4** Example: Handling `ArithmeticExceptions` and `InputMismatchExceptions`
- 11.5** When to Use Exception Handling
- 11.6** Java Exception Hierarchy
- 11.7** `finally` Block
- 11.8** Stack Unwinding
- 11.9** `printStackTrace`, `getStackTrace` and `getMessage`
- 11.10** Chained Exceptions
- 11.11** Declaring New Exception Types
- 11.12** Preconditions and Postconditions
- 11.13** Assertions
- 11.14** Wrap-Up

Assignments

11.20

Chapter 12 (Optional)

- 12.1** Case Study Introduction
- 12.2** Examining the Requirements Document
- 12.3** Identifying the Classes in a Requirements Document
- 12.4** Identifying Class Attributes
- 12.5** Identifying Objects' States and Activities
- 12.6** Identifying Class Operations
- 12.7** Indicating Collaboration Among Objects
- 12.8** Wrap-Up

Assignments

Chapter 13 (Optional)

- 13.1** Introduction
- 13.2** Starting to Program the Classes of the ATM System
- 13.3** Incorporating Inheritance and Polymorphism into the ATM System
 - 13.3.1 Implementing the ATM System Design (Incorporating Inheritance)
- 13.4** ATM Case Study Implementation
 - 13.4.1 Class ATM
 - 13.4.2 Class Screen
 - 13.4.3 Class Keypad
 - 13.4.4 Class CashDispenser
 - 13.4.5 Class DepositSlot
 - 13.4.6 Class Account
 - 13.4.7 Class BankDatabase
 - 13.4.8 Class Transaction
 - 13.4.9 Class BalanceInquiry
 - 13.4.10 Class Withdrawal
 - 13.4.11 Class Deposit
 - 13.4.12 Class ATMCaseStudy
- 13.5** Wrap-Up

Assignments

Chapter 14

- 14.1** Introduction
- 14.2** Java's New Nimbus Look-and-Feel
- 14.3** Simple GUI-Based Input/Output with `JOptionPane`
- 14.4** Overview of Swing Components
- 14.5** Displaying Text and Images in a Window
- 14.6** Text Fields and an Introduction to Event Handling with Nested Classes
- 14.7** Common GUI Event Types and Listener Interfaces
- 14.8** How Event Handling Works
- 14.9** `JButton`
- 14.10** Buttons That Maintain State
 - 14.10.1 `JCheckBox`
 - 14.10.2 `JRadioButton`
- 14.11** `JComboBox` and Using an Anonymous Inner Class for Event Handling

Assignments

- 14.4
- 14.5
- 14.6
- 14.7
- 14.16

Chapter 15

- 15.1** Introduction
- 15.2** Graphics Contexts and Graphics Objects
- 15.3** Color Control
- 15.4** Manipulating Fonts
- 15.5** Drawing Lines, Rectangles and Ovals
- 15.6** Drawing Arcs
- 15.7** Drawing Polygons and Polylines
- 15.8** Java 2D API
- 15.9** Wrap-Up

Assignments

- 15.4
- 15.5
- 15.20

Chapter 23

- 23.1** Introduction
- 23.2** Sample Applets Provided with the JDK
- 23.3** Simple Java Applet: Drawing a String
 - 23.3.1 Executing `WelcomeApplet` in the appletviewer
 - 23.3.2 Executing an Applet in a Web Browser
- 23.4** Applet Life-Cycle Methods
- 23.5** Initializing an Instance Variable with Method `init`
- 23.6** Sandbox Security Model
- 23.7** Java Web Start and the Java Network Launch Protocol (JNLP)
 - 23.7.1 Packaging the `DrawTest` Applet for Use with Java Web Start
 - 23.7.2 JNLP Document for the `DrawTest` Applet
- 23.8** Wrap-Up

Assignments

23.4

Chapter 24

- 24.1** Introduction
- 24.2** Loading, Displaying and Scaling Images
- 24.3** Animating a Series of Images
- 24.4** Image Maps
- 24.5** Loading and Playing Audio Clips
- 24.6** Playing Video and Other Media with Java Media Framework
- 24.7** Wrap-Up
- 24.8** Web Resources

Assignments

24.16

Chapter 25

- 25.1** Introduction
- 25.2** JSlider
- 25.3** Windows: Additional Notes
- 25.4** Using Menus with Frames
- 25.5** JPopupMenu
- 25.6** Pluggable Look-and-Feel
- 25.7** JDesktopPane and JInternalFrame
- 25.8** JTabbedPane
- 25.9** Layout Managers: BorderLayout and GridBagLayout
- 25.10** Wrap-Up

Assignments

25.10

Assignments

All assignments will store in the class folder on a student provided portable drive. Students are highly encouraged to make backup copies of all assignments. All completed assignments will be moved to an assignment area provided by the instructor. The instructor will assist with this effort. Assignments are due one week after completion of the chapter in which they are assigned and will be turned in to the instructor during the lab portion of the class. The instructor will mark the assignments turned in at that time.

Grades

Class assignments	95%
Discretionary	5%

Withdrawal Policy

Student may withdraw, in writing at the Registrar's Office, for any reason until the 10th week of classes. From the 11th through the 13th week, a student may withdraw with the signature of the instructor or advisor.

Disabilities Statement

If you have a hidden or visible disability, which may require classroom or test-taking modifications, please see me as soon as possible. If you have not already done so, please be sure to notify Chris Scarborough, Disabled Student Counselor.