

# Introduction to Programming 2



# Course Description

- Introduction to Programming 2 gives a discussion of different advanced programming constructs and techniques using Java.
- General Overview of the Course
  - More on object-oriented programming concepts
  - Event handling
  - Exception handling
  - API programming
  - Recursion
  - Abstract data types



# Course Requirements

- Course Prerequisite
  - Introduction to Programming 1
- Programming Tools
  - J2SE SDK Version 1.5
  - NetBeans IDE runs on the J2SE JDK 5.0 (Java™ 2 JDK, Standard Edition)
    - consists of the Java Runtime Environment plus developers tools for compiling, debugging, and running applications written in the Java™ language



# Course Outline

- Review of Basic Concepts in Java
  - Object-Oriented Concepts
  - Java Program Structure
- Exceptions and Assertions
  - What are Exceptions?
  - Catching Exceptions
  - Throwing Exceptions
  - Exception Categories
  - Assertions



# Course Outline

- Advanced Programming Techniques
  - Recursion
  - Abstract Data Types
  - Java Collections
- Tour of the java.lang Package
  - The Math Class
  - The String Class and the StringBuffer Class
  - The Wrapper Classes
  - The Process and the Runtime Class
  - The System Class



# Course Outline

- Text-Based Applications
  - Command-line Arguments and System Properties
  - Reading from Standard Input
  - File Handling
- Sorting Algorithms
  - Insertion Sort
  - Selection Sort
  - Merge Sort
  - Quicksort



# Course Outline

- Abstract Windowing Toolkit & Swing
  - Abstract Windowing Toolkit (AWT) vs. Swing
  - AWT GUI Components
  - Layout Managers
  - Swing GUI Components



# Course Outline

- GUI Event Handling
  - Delegation Event Model
  - Event Classes
  - Event Listeners
  - Adapter Classes
  - Inner Classes and Anonymous Inner Classes





# Course Outline

- Threads
  - Thread definition and Basics
  - The Thread Class
  - Creating Threads
  - Extending Thread Class
  - Implementing Runnable Interface
  - Synchronization
  - Interthread Communication



# Course Outline

- Networking
  - Basic Concepts on Networking
  - The Java Networking Package
  - ServerSocket and Socket Classes
  - MulticastSocket and DatagramPacket Classes
- Applets
  - Creating Applets
  - Applet Methods
  - Applet HTML Tags



# Course Outline

- Advanced I/O Streams
  - General Stream Types
  - The File Class
  - Reader Classes
  - Writer Classes
  - A Basic Reader/Writer Example
  - Modified Reader/Writer Example
  - InputStream Classes
  - OutputStream Classes
  - A Basic InputStream/OutputStream Example
  - Modified InputStream/OutputStream Example
  - Serialization



# Course Outline

- An Introduction to Generics
  - Why Generics?
  - Declaring a Generic Class
  - Constrained Generics
  - Declaring a Generic Method

