



COURSE TITLE	:Introduction to Programming 2
COURSE PREREQUISITE	:Introduction to Programming 1
COURSE DURATION	:16 weeks (3 hours/week)
COURSE METHODOLOGY	:Combination of lecture and laboratory exercises

Course Description

Introduction to Programming 2 provides a more detailed discussion of different object-oriented programming concepts including classes, inheritance and polymorphism. Event handling, exception handling and API programming are also taught to the students in this course. The students will learn about advanced programming techniques such as recursion and abstract data types (stacks, queues and linked structures) as well.

Course Outline

Week	Topics
1 to 2	Review of Basic Concepts in Java <ul style="list-style-type: none"> • Object-Oriented Concepts • Java Program Structure
3	Exceptions and Assertions <ul style="list-style-type: none"> • What are Exceptions? • Catching Exceptions (try, catch, finally) • Throwing Exceptions (throw, throws) • Exception Categories (API, user-defined) • Assertions
4 to 5	Advanced Programming Techniques <ul style="list-style-type: none"> • Recursion • Abstract Data Types <ul style="list-style-type: none"> • Stacks, Queues and Linked Lists • Java Collections
6	Tour of the java.lang Package <ul style="list-style-type: none"> • The Math Class • The String Class and the StringBuffer Class • The Wrapper Classes • The Process and the Runtime Class • The System Class
7	Text-Based Applications <ul style="list-style-type: none"> • Command-line Arguments and System Properties • Reading from Standard Input • File Handling
8	Sorting Algorithms <ul style="list-style-type: none"> • Insertion Sort • Selection Sort

	<ul style="list-style-type: none"> • Merge Sort • Quicksort
9	Abstract Windowing Toolkit & Swing <ul style="list-style-type: none"> • Abstract Windowing Toolkit (AWT) vs. Swing • AWT GUI Components • Layout Managers • Swing GUI Components
10	GUI Event Handling <ul style="list-style-type: none"> • Delegation Event Model • Event Classes • Event Listeners • Adapter Classes • Inner Classes and Anonymous Inner Classes
11 to 12	Threads <ul style="list-style-type: none"> • Thread definition and Basics • The Thread Class • Creating Threads <ul style="list-style-type: none"> • Extending Thread Class • Implementing Runnable Interface • Synchronization • Interthread Communication • Concurrency Utilities <ul style="list-style-type: none"> • The Executor Interface • The Callable Interface
13	Networking <ul style="list-style-type: none"> • Basic Concepts on Networking • The Java Networking Package <ul style="list-style-type: none"> • ServerSocket and Socket Classes • MulticastSocket and DatagramPacket Classes
14	Applets <ul style="list-style-type: none"> • Creating Applets • Applet Methods • Applet HTML Tags
15	Advanced I/O Streams <ul style="list-style-type: none"> • 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
16	An Introduction to Generics <ul style="list-style-type: none"> • Why Generics? • Declaring a Generic Class • Constrained Generics • Declaring a Generic Method

Requirements

Hardware

Minimum Hardware Configuration

- **Microsoft Windows operating systems:**
 - **Processor:** 500 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 384 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Solaris™ operating system (SPARC version):**
 - **Processor:** 500 MHz Ultra 60, SunBlade 150, or equivalent workstation
 - **Memory:** 512 megabytes
 - **Disk space:** 150 megabytes of free disk space
- **Solaris™ operating system (x86 version):**
 - **Processor:** AMD Opteron 100 series Sun Ultra 20 workstation or equivalent
 - **Memory:** 512 megabytes
 - **Disk space:** 150 megabytes of free disk space
- **Linux operating system:**
 - **Processor:** 500 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 384 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Macintosh OS X operating system:**
 - **Processor:** PowerPC G4
 - **Memory:** 512 megabytes
 - **Disk space:** 125 megabytes of free disk space

Recommended Hardware Configuration

- **Microsoft Windows operating systems:**
 - **Processor:** 780 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 512 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Solaris™ operating system (SPARC version):**
 - **Processor:** UltraSPARC IIIi 1.5 GHz SunBlade 1500 workstation or equivalent
 - **Memory:** 1 gigabyte
 - **Disk space:** 150 megabytes of free disk space
- **Solaris™ operating system (x86 version):**
 - **Processor:** AMD Opteron 100 series Sun Ultra 20 workstation or equivalent
 - **Memory:** 1 gigabyte
 - **Disk space:** 150 megabytes of free disk space
- **Linux operating system:**
 - **Processor:** 800 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 512 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Macintosh OS X operating system:**
 - **Processor:** PowerPC G5
 - **Memory:** 1 gigabyte
 - **Disk space:** 125 megabytes of free disk space

Operating System

NetBeans IDE runs on operating systems that support the Java™ VM. Below is a list of platforms that NetBeans IDE has been tested on.

- Microsoft Windows XP Professional SP2
- Solaris operating system (SPARC® and x86 Platform Editions) versions 8, 9, and 10
- Red Hat Fedora Core 3
- Mac OS X 10.4

Software

NetBeans IDE runs on the J2SE JDK 5.0 (Java™ 2 JDK, Standard Edition), which consists of the Java Runtime Environment plus developers tools for compiling, debugging, and running applications written in the Java™ language. NetBeans IDE 5.0 has also runs on J2SE SDK version 1.4.2, but it has only been tested on JDK 5.0.

For more information, please visit:

<http://www.netbeans.org/community/releases/50/relnotes.html>