

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT./CENTRE: **Electronics and Computer Engineering**

1. Subject Code: **EC – 101B** Course Title: **Fundamentals of Object Oriented Programming**

2. Contact Hours: **L: 3 T: 0 P: 2**

3. Examination Duration (Hrs.): **Theory**

0	3
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Practical

0	0
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4. Relative Weight: **CWS**

15

PRS

15

MTE

30

ETE

40

PRE

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5. Credits:

0	4
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 6. Semester

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Autumn

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Spring

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Both

7. Pre-requisite: **NIL**

8. Subject Area: **ESC**

9. Objective: To introduce the concepts of Java Programming, Classes in Java, Inheritance, Applets.

10. Details of the Course:

Sl. No.	Contents	Contact Hours
1.	Basic Computer Fundamentals: Introduction to computer systems, computer as a programmed machine; CPU organization, ALU, registers, memory; machine language, assembly language, idea of program execution at micro level, high level languages; concept of flow chart and algorithms, algorithms to programs, efficiency of algorithms, big-O notation; object oriented programming concept, difference in approach from procedural programming.	8
2.	Introduction to Linux and Java Programming Environment, Java compiler and virtual machine: Structure of a Java program, stand-alone programs and applets; concepts of portability.	3
3.	Basic Programming Elements in Java: Data types, variables and array operators, assignment and selection statements iterative structures, nested loops.	6
4.	Classes in Java: General form of a class, creating objects, access control in classes; Constructors, methods, finalization, parameters, method overloading, recursive methods, returning objects, static members, final qualifier, nested and inner classes, string handling in Java, I/O mechanism, command line arguments.	10
5.	Inheritance: Basics super classes and subclasses, the keyword	5

	extends, multilevel hierarchy, method overriding; run time polymorphism, abstract classes, final in inheritance, the object class.	
6.	Packages and Interfaces: Defining package, access protection, importing classes and packages, defining and implementing interfaces, nested interfaces, use of interfaces, variables in interfaces.	3
7.	Exception Handling: Fundamentals, types of exceptions catching exceptions, multiple catching, nested try statements, uncaught exceptions, throw and throws, finally mechanism, built-in exceptions, creating exception subclasses, using exceptions.	4
8.	Applets: Applet fundamentals, native methods, static import, the applet class, applet display method, requesting repainting, a banner applet, passing parameters to applets, uses of applets.	3
	Total	42

11. Suggested Books:

Sl. No.	Name of Books / Authors	Year of Publication
1.	Dietel and Associates, "Java How to Program", 7 th Ed., Prentice-Hall.	2006
2.	David Flanagan, "Java in a Nutshell", 5 th Ed., O'Reilly Media, Inc.	2005
3.	Bruce Eckel, "Thinking in Java", Prentice-Hall.	1998
4.	James Gosling, Bill Joy, Guy Steele and Gilad Bracha, "The Java Language Specification", 2 nd Ed., Prentice-Hall.	2000