R.T. M. Nagpur University, Nagpur
FOUR YEAR B.E. COURSE

B.E. SCHEME OF EXAMINATION wef: 2021-22

Scheme of Teaching & Examination of Bachelor of Engineering III Semester B.E. (Computer Science and Engineering)

Sr. No.	Course Code	Category	Course Name	Hours/ Week			Credits	Maximum Marks				
								Theory		Practical		Total
				L	T	P		Internal	University	Internal	University	
1	BECSE301T	Basic Sciences courses	Applied Mathematics – III	3	1	-	4.00	30	70	-	-	100
2	BECSE302T	Professional core courses	Object Oriented Programming with Java	3	1	-	4.00	30	70	-	-	100
3	BECSE303T	Professional core courses	Operating System	3	-	-	3.00	30	70	-	-	100
4	BECSE304T	Professional core courses	Computer Architecture & Digital System	3	1	-	4.00	30	70	-	-	100
5	BECSE305T	Professional core courses	Ethics in IT	3	-	-	3.00	30	70			100
6	BECSE306T	Humanities Social and Management Courses	Universal Human Values	2	-	-	2.00	15	35	-	-	50
7	BECSE307T	Mandatory Course	Environment Science (Audit)	2	-	-	0.00	-	-	-	-	-
8	BECSE302P	Professional core courses	Object Oriented Programming with Java Lab	-	-	2	1.00	-	-	25	25	50
9	BECSE303P	Professional core courses	Operating System Lab	-	-	2	1.00	-	-	25	25	50
10	BECSE308P	Professional core courses	Computer Workshop-I Lab	-	-	2	1.00	-	-	25	25	50
Total				19	3	6	23.00	165	385	75	75	700

Dr. S. V. Sonekar
Chairman.

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FOUR YEAR BACHELOR OF ENGINEERING (B.E.) DEGREE COURSE

SEMESTER: 3rd (C.B.C.S.)

BRANCH: COMPUTER SCIENCE & ENGINEERING

Subject : ***Object Oriented Programming with Java*** Subject Code : **BECSE302T**

Load	Credits	College Assessment Marks	University Evaluation	Total Marks
03 Hrs. (Theory) 01 Hr. (Tutorial)	04	30	70	100

Aim:

This course explains the fundamental ideas behind the object-oriented approach to programming. Knowledge of java helps to create the latest innovations in programming. Like the successful computerlanguages that came before, java is the blend of the best elements of its rich heritage combined with the innovative concepts required by its unique environment. This course involves OOP's concepts, java basics concepts, inheritance, polymorphism, interfaces, inner classes, packages, Exception handling, multithreading and objects Oriented Methodology basic concepts.

Prerequisite(s): Knowledge of structure programming language and Application development

Course Objectives:

1	Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2	Be able to use the Java SDK environment to create, debug and run simple Java programs.
3	To analyze the object-oriented paradigm using java programming language
4	To implement small/medium scale java programs to resolve small business problems.

Course Outcomes:

At the end of this course student are able to:

CO1	Identify classes, objects, members of a class and relationships among them for a specific problem
CO2	Understand and demonstrate the concepts of garbage collection, polymorphism, inheritance etc.

CO3	Do numeric (algebraic) and string-based computation.
CO4	Understand and implement modularity as well as basic error handling techniques
CO5	Develop, design and implement small multithreaded programs using Java language
CO6	Apply appropriate problem-solving strategies for the implementation of small /medium scale java applications

Unit I: **[8 Hrs]**

Object Oriented Programming features: objects and classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Characteristics of Java, Java Source File Structure – Compilation. Fundamental Programming Structures in Java, Introduction of JVM, Object class, Constructors, Access specifiers, static members, Data Types.

Unit II: **[7 Hrs]**

Operators, Control Flow, Wrapper classes, Command line arguments, static modifier, this keyword, Garbage collection, Java Arrays, Declaration and initialization of an array, One Dimensional Array, Two-Dimensional Array, Vector. String Handling: String, StringBuffer and StringBuilder class, String constructors, Data conversion using valueOf(), toString() methods, Methods for String Comparison, Searching string and modifying string

Unit III: **[7 Hrs]**

Inheritance: Types of inheritance, Abstract class, Method Overriding, super keyword, final modifier Packages: Package Fundamental, importing packages, Concept of interface, Exception Handling: Fundamental Exception type: Checked, Unchecked Exceptions, throw and throws keywords, creating user defined exceptions, Built-in Exceptions.

Unit IV: **[7 Hrs]**

Threads and Multithreading: Fundamentals, Thread Life Cycle, Ways of creating threads, Creating multiple threads, isAlive (), join (), sleep(), Thread Synchronization, Thread priorities, Interthread communication, Methods for suspending, resuming and stopping threads

Unit V: **[7 Hrs]**

Collection Framework: Introduction, Difference between Array and Collection, List interface and its classes, Set interface and its classes, Map interface and its classes.

Text Books:

- The Complete Reference (8th Edition) by Herbelt Schildt, Tata McGraw-Hill publications
- Head First Java,2nd Edition by Kathy Sierra, Bert Bates, O'Reilly Media
- Programming in Java(Fifth edition) by E Balguruswami, McGraw Hill Education

Reference Books:

- Sun Certified Java Programmer for Java 6 by Kathy Sierra.
- The JavaTM Programming Language (3rd Edition) by Arnold, Holmes, Gosling, Goteti
- Core Java for Beginners by Rashmi Kanta Das(III Edition) Vikas Publication
- Java A Beginner's Guide, Fifth Edition, Tata McGra