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|------------------------------|--------------------|
| <b>Branch Name:</b>          | MCA                |
| <b>Program Code:</b>         | CS201              |
| <b>Course Title:</b>         | Java Programming   |
| <b>Course Code:</b>          | 4CS2010201T        |
| <b>Pre-requisite Course:</b> | Programming Skills |

### Course Objective:

The objectives of the course are to:

1. Get a better understanding of the concepts of Object-Oriented Programming Language and use of Java.
2. Develop proficiency in creating console based and GUI based applications using the Java Programming Language.
3. Gets a good understanding of developing multithreaded applications using Java Programming Language.

### Teaching and Examination Scheme:

| Teaching Scheme (Hours per week) |              |               |        | Evaluation Scheme (Marks) |                       |                       |                       |               |
|----------------------------------|--------------|---------------|--------|---------------------------|-----------------------|-----------------------|-----------------------|---------------|
| Lecture (L)                      | Tutorial (T) | Practical (P) | Credit | Theory (Marks)            |                       | Practical (Marks)     |                       | Total (Marks) |
|                                  |              |               |        | University Assessment     | Continuous Assessment | University Assessment | Continuous Assessment |               |
| 3                                | -            | -             | 3      | 60                        | 40                    | -                     | -                     | 100           |

### Course Contents:

| Unit No | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total Hours | Weightage (%) |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|
| 1       | <b>Object Oriented Programming &amp; Introduction to Java:</b><br>Basics of Object-Oriented Programming, Features of the Java Language, Creating an simple java application, Compiling and executing Java Application<br><b>Data Types, Variables, Arrays and String Handling:</b><br>Simple data types, Literals & Variables, Type conversion and casting, Arrays, String class, Operations on String.<br><b>Operators:</b><br>Arithmetic, Bitwise, Relational, Boolean Logical, Assignment, Conditional Operators, Operator Precedence<br><b>Control Statements:</b><br>Selection Statements, Iteration Statements, Jump Statements                                                                                                                                                                  | 10          | 25            |
| 2       | <b>Defining a class:</b><br>Various members within a class, instance variables, Methods and their overloading, Constructors and their overloading, Garbage Collection and finalize method, static variables and methods, Initialize and Class Initialize Block.<br><b>Inheritance and subclassing:</b><br>Defining subclasses, Use of super, Methods and variable binding, Using final with variables, methods and classes<br><b>Abstract Classes and Interfaces:</b><br>Abstract classes and abstract methods, Single inheritance of classes, Interfaces<br><b>Packages and use of access specifiers:</b><br>Uses of package and import statements, use of static imports, use of CLASSPATH for class loading, Access specifiers<br><b>java.util package:</b><br>Date, TimeZone and Calendar classes. | 10          | 25            |

|          |                                                                                                                                                                                                                                                                                                                                                |           |           |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| <b>3</b> | <b>Exception Handling:</b><br>Exception Handling Fundamentals, Types of Exceptions, Dealing with Exceptions<br>Java's Built-in Exceptions, Defining Your Own Exceptions, Chained Exceptions.<br><b>Multi-threading:</b><br>Understanding Java Thread Model, Creating a Threads, Thread Priorities, Synchronization, Inter thread Communication | <b>10</b> | <b>25</b> |
| <b>4</b> | <b>Input and Output:</b><br>I/O Basics, Reading Console Input, Writing Console Output.<br><b>GUI Programming:</b><br>Overview of the Components, Component Properties and Graphics Context, GUI Containers and Layout Managers, Event Handling                                                                                                 | <b>10</b> | <b>25</b> |

**Text Books:**

- Herbert Schildt, "The Complete Reference Java2", Fifth Edition, Tata McGRAW-Hill

**Reference Books:**

- Pravin Jain, "The class of Java" Pearson Education, (2010).
- Ivor Horton, "Beginning Java 2", JDK 5 Edition, Wiley Computer Publishing, (2007)

**List of Open Source Software/learning website:**

<https://www.geeksforgeeks.org>

<https://www.w3schools.com>

<https://www.codecademy.com>

<https://www.tutorialspoint.com>

**Course Learning Outcomes (CLO): On completion of this course, the students will be able to:**

| <b>CLO</b>  | <b>Description</b>                                                                                     | <b>Bloom's Taxonomy Level</b>                         |
|-------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>CLO1</b> | Create appropriate classes using the Java Programming Language for solving real world problems.        | 6. Creating, 5. Evaluate<br>3. Applying<br>4. Analyze |
| <b>CLO2</b> | Develop console based and GUI based applications using the Java Programming Language.                  | 1 Remembering 2. Understanding 6. Creating            |
| <b>CLO3</b> | Develop multi-threaded applications using the Java Programming Language                                | 1 Remembering<br>2. Understanding<br>6. Create        |
| <b>CLO4</b> | Create Applets for simple web based applications.                                                      | 6. Creating, 5. Evaluate<br>3. Applying<br>4. Analyze |
| <b>CLO5</b> | Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes. | 3. Applying,<br>6. Creating                           |
| <b>CLO6</b> | Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.    | 1 Remembering<br>2. Understanding 6. Creating         |

**Mapping of CLOs with POs & PSOs**

| Course<br>Learning<br>Outcome<br>s | Program Outcomes (POs) |             |             |             |             |             |             |             |             |              |              |              | Program<br>Specific<br>Outcomes<br>(PSOs) |          |
|------------------------------------|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|-------------------------------------------|----------|
|                                    | P<br>O<br>1            | P<br>O<br>2 | P<br>O<br>3 | P<br>O<br>4 | P<br>O<br>5 | P<br>O<br>6 | P<br>O<br>7 | P<br>O<br>8 | P<br>O<br>9 | P<br>O1<br>0 | P<br>O1<br>1 | P<br>O1<br>2 | PS<br>O1                                  | PSO<br>2 |
| <b>CLO1</b>                        |                        | H           | H           |             |             |             | L           |             |             |              | M            | M            | H                                         | M        |
| <b>CLO2</b>                        |                        | H           | H           |             |             | M           |             | M           |             | H            | M            | M            | H                                         | M        |
| <b>CLO3</b>                        |                        |             |             |             | M           | H           |             | M           |             |              |              |              | H                                         | M        |
| <b>CLO4</b>                        |                        | M           | M           | M           |             | M           |             | M           | M           |              |              |              |                                           | M        |
| <b>CLO5</b>                        |                        |             |             | M           | H           | M           | H           | M           | H           |              |              |              |                                           |          |
| <b>CLO6</b>                        |                        |             |             |             |             |             |             |             |             | L            |              | M            |                                           | H        |

**H:High, M:Medium, L:Low**