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| Branch Name: | IMCA |
| Program Code: | CS301 |
| Course Name: | Fundamentals of Java Programming |
| Course Code: | 1CS3010401T |
| Pre-requisite Course: | Basic Knowledge of Object-Oriented Programming |

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. Aare of Core Java concepts. Students are expected to learn various terminologies related to Java Programming such as JVM, JDK, constructor, inheritance, interfaces, package, exception handling, etc.
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 | Tutorial | Practical | Credit | Theory | | Practical | | Total |
| | | | | University Assessment | Continuous Assessment | University Assessment | Continuous Assessment | |
| 4 | - | - | 4 | 60 | 40 | - | - | 100 |

Course Contents:

| Unit No | Topic | Total Hours | Weightage (%) |
|---------|--|-------------|---------------|
| 1 | <p>Object Oriented Programming & Introduction to Java: Features of Java, IDE for Java, Object-Oriented Programming in Java, Java Program Structure and Java's Class Library</p> <p>Data Types, Variables: The Simple Data Types, Literals, Variables, Type Conversion and Casting, Automatic Type, Promotion in expressions</p> <p>Operators, Selection Statements: Arithmetic, Bitwise, Relational, Boolean Logical, Assignment, Conditional Operators, Operator Precedence, Control Statements – if and switch, Scope of Variable, Iterative Statements – for, while, do... While, Jump Statements.</p> | 12 | 25 |
| 2 | <p>Defining a class, Objects and Methods: Definition of a Class, Definition of Methods, Constructors, Creating Objects of a Class, Assigning Object Reference Variables, The Variable this, Defining and Using a Class, Automatic Garbage Collection</p> <p>Arrays and Strings: Arrays, Arrays of Characters, String Handling Using String Class, Operations on String Handling Using String Buffer Class.</p> | 10 | 25 |
| 3 | <p>Extending Classes and Inheritance: Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, Polymorphism, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier, The Universal Super class-Object Class.</p> <p>Packages & Interfaces: Understanding Packages, Defining a Package, Packaging up Your Classes, Adding Classes from a Package to Your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface</p> | 10 | 25 |

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|----------|---|----|----|
| 4 | <p>Input/Output in Java: I/O Basics, Reading Console Input, Writing Console Output, Reading and Writing on Files, Random Access Files.</p> <p>Exception Handling: The Idea behind Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions</p> <p>Multithreading Programming: Understanding Threads, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Inter-thread communication.</p> | 12 | 25 |
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Text Books:

1. Programming with JAVA By E Balagurusamy, Tata McGraw Hill.
2. Head First Java: A Brain-Friendly Guide (2nd Edition)
3. The Complete Reference JAVA 2, 4th Edition, TMH Publication
4. Beginning JAVA 2 (JDK1.3 Edition), Ivor Horton, WROX Public.

References Books:

1. Teach Yourself JAVA, Joseph O'Neil & Herb Schildt, Tata McGraw Hill.
2. JAVA 2 UNLEASHED, Tech Media Publications.
3. JAVA 2(1.3) API Documentations.
4. Programming with JAVA: A primer, Balagurusamy, 2nd Edition, Tata McGraw Hill.

List of Open-Source Software/learning website:

1. <http://williamstallings.com/ComputerOrganization>
2. <https://www.pearsonhighered.com/cs-resources/products/product.html#product,isbn=0132916525>
3. <https://www.codecademy.com>
4. <https://www.geeksforgeeks.org>
5. <https://www.programiz.com/java-programming>

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

| CLO | Description | Bloom's Taxonomy Level |
|------|--|---|
| CLO1 | To solve a problem in Core Java using object oriented programming. | 1 Remembering 2. Understanding 6 Creating |
| CLO2 | To have fundamental knowledge of the Java programming language. | 1 Remembering 2. Understanding 6. Creating |
| CLO3 | To understand the basic syntax/terminology used in the Java programming language. | 1 Remembering 2. Understanding 6. Creati |
| CLO4 | To write, compile and interpret Java programs. | 3. Applying, 6. Creating |
| CLO5 | Apply the concepts of Multithreading and Exception handling to develop efficient and error free code | 6. Creating, 5. Evaluate 3. Applying 4. Analyze |
| CLO6 | Develop reusable programs using the concepts of inheritance, Polymorphism, interfaces and packages. | 6. Creating, 5. Evaluate 3. Applying 4. Analyze |

Mapping of CLOs with Pos & PSOs

| Course Learning Outcomes | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes(PSOs) | |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---------------------------------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CLO1 | L | L | | M | | L | | L | M | | L | | M | |
| CLO2 | | M | L | | M | | M | | M | L | | | | M |
| CLO3 | M | | M | M | | L | | L | | M | | M | H | |
| CLO4 | M | | H | | M | | | | M | | L | | L | |
| CLO5 | | M | | H | H | H | | M | | M | | L | | L |
| CLO6 | M | | L | | H | H | | H | | | M | | M | |

H:High, M:Medium, L:Low