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| **Course Title:** | **Object Oriented Programming** | | | | **Course Code:** | **R204GA05302** |
| **Class & Sem:** | **II B. Tech I Sem Section A & B** | | | | **Regulations:** | **SRIT-R20** |
| **Course Structure:** | **Theory** | **Tutorial** | **Lab** | **Credits** | **Core/Elective:** | **Core** |
| **3** | **0** | **0** | **3** |
| **Instructor 1:** | **Dr. P. CHITRALINGAPPA** | | | **Instructor 2:** |  | **AY: 2023-24** |

**1. Prerequisites:** Action Script, Procedural Languages, Object-Oriented Languages.

**2. Course Description:** This course deals with the concepts of Introduction, Data Types, Operators and Expressions, Classes and Methods, Inheritance, Exceptions, Packages, Interfaces, I/O, packages, collection Framework, AWT components, Event handling and swings.

**3. Detailed Syllabus:**

**UNIT – I: (13 Periods)**

**Introduction to Java:** Object Oriented Programming, History and Evolution of java, Java’s magic: The byte code, Java Buzzwords, Java Keywords, The Java class Libraries.

**Data Types, Operators and Control Statements:** Java Data Types, Variables and Constants, Naming Conventions, Type conversion and casting, Arrays, Operators & Expressions, Java Control Statements.

**Introducing Classes and Methods:** Classes and Objects, Introducing Methods, Constructors, this Keyword, Garbage Collection. Overloading Methods and Constructors, Argument passing, Recursion, Introducing Access Control, understanding static, Command Line Arguments, Exploring the String class.

**UNIT – II: (11 Periods)**

**Inheritance:** Basics, super keyword, method overriding, dynamic method dispatch, Abstract classes, using final with inheritance, Introducing Nested and Inner classes.

**Exception Handling:** Fundamentals, Exception Types, Using try and catch, Multiple catch clauses, Nested try statements, throw, throws, finally, Java Built-in Exceptions, Creating user-defined exceptions.

**UNIT – III: (14 Periods)**

**Packages and Interfaces:** Basics of Packages, Access protection, Importing Packages, Creating and Importing User-defined Packages.

**Interfaces:** Declaring, Implementing and Extending Interfaces, using static methods in an Interface, using final keyword in interfaces.

**Multithreaded Programming:** Multithreading in Java, The Java Thread Model, Life Cycle of a Thread, the main thread, Creating Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Inter Thread Communication, Suspending, resuming and stopping threads, obtaining a thread state, The finalize () method.

**UNIT – IV: (11 Periods)**

**Collections Framework:** Overview, Collection Interfaces, Collection Classes. Working with Maps, Comparators.

**Introduction to AWT: Windows, Graphics and Text**

AWT classes, window fundamentals, frame windows, creating and displaying information within a window, Graphics, Color, Fonts, managing text output using Font Metrics.

**UNIT – V: (14 Periods)**

**Event Handling in Java:** The Delegation Event Model, Event Classes and Event Listener Interfaces.

**AWT Controls, Layout Managers, and Menus:** AWT Control Fundamentals, Labels, Buttons, Check Boxes, CheckboxGroup, Choice Controls, Lists, Scroll Bars, TextField and TextArea, Layout Managers, Menu Bars and Menus, Dialog Boxes, FileDialog.

**Swings:** Swing Features, MVC Connection, Components and Containers, JLabel, ImageIcon, JTextField, Swing Buttons, Check Boxes, Radio Buttons, JTabbedPane, JScrollPane, JList, JComboBox, JTree, and JTable.

**Total Periods: 63**

**4. Text Books:**

1. **“The Complete Reference -Java”,** Herbert Schildt, Mc GRAW HILL Edition, 11th Edition, 2018.
2. **“Java – How to Program”**, Paul Deitel, Harvey Deitel, PHI, 11th Edition, 2017.

**5. Reference Books:**

1. **“A Programmers Guide to Java SCJP”**, Third Edition, Mughal, Rasmussen, Pearson, 2009.
2. **“Programming with Java”** T.V.Suresh Kumar, B.Eswara Reddy, P.Raghavan Pearson Edition, 2011.
3. **“Java Fundamentals - A Comprehensive Introduction”**, Herbert Schildt and Dale Skrien, Special Indian Edition, McGrawHill, 2013.

**6. Course Outcomes:**

On successful completion of this course the students will be able:

1. Describe the object-oriented principles in Java.
2. Develop programs using type casting, type promotion control statements for efficient problem solving.
3. implement Inheritance and Exceptional handling for problem solving.
4. Implement threaded programming and usage of inheritance and packages.
5. Develop programs using Collection Framework and AWT frame work.
6. Develop programs using layout manager, Swing frame work and AWT controls suitable for the given problem scenario.
7. **Lesson Plan**

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| **S. No.** | **Topics to be covered** | **Mode of Delivery** | **Periods Required** | **Books followed** | **Scheduled Date** |
| **UNIT I**  **Introduction to Java, Data types, Arrays and Variables, Operators, Control Statements, Introducing Classes** | | | | | |
| **1** | Introduction to JAVA – Object Oriented Programming | ICT | 1 | T1, T2, R1 | 28-08-2023 |
| **2** | History and Evolution of java, | ICT | 1 | T1, T2, R1 | 28-08-2023 |
| **3** | Java’s magic: The byte code, Java Buzzwords, OOP Concepts, Java Keywords, | ICT | 1 | T1, T2, R1 | 29-08-2023 |
| **4** | The Java class Libraries | ICT | 2 | T1, T2, R1 | 30-08-2023 |
| **5** | Java Data Types, Variables and Constants, | ICT | 1 | T1, T2, R1 | 31-08-2023 |
| **6** | Naming Conventions, | ICT | 1 | T1, T2, R1 | 07-09-2023 |
| **7** | Type conversion and casting, Arrays | ICT | 1 | T1, T2, R1 | 12-09-2023 |
| **8** | Operators & Expressions, Java Control Statements, Classes and Objects | ICT | 1 | T1, T2, R1 | 12-09-2023 |
| **9** | Introducing Methods, Constructors, this Keyword, Garbage Collection. | ICT | 1 | T1, T2, R1 | 13-09-2023 |
| 10 | Overloading Methods and Constructors | ICT | 1 | T1, T2, R1 | 14-09-2023 |
| 11 | Argument passing, Recursion, Introducing Access Control, understanding static, Command Line Arguments, Exploring the String class. | ICT | 2 | T1, T2, R1 | 19-09-2023 |
| **UNIT II**  **Inheritance, Exception Handling** | | | | | |
| **1** | Inheritance: Basics, super keyword, method overriding | ICT | 2 | T1, T2, R1 | 20-09-2023 |
| **2** | dynamic method dispatch, | ICT | 1 | T1, T2, R1 | 21-09-2023 |
| **3** | Abstract classes, using final with inheritance | ICT | 1 | T1, T2, R1 | 26-09-2023 |
| **4** | Introducing Nested and Inner classes, Exception Handling: Fundamentals | ICT | 2 | T1, T2, R1 | 27-09-2023 |
| **5** | Exception Types, Using try and catch | ICT | 1 | T1, T2, R1 | 28-10-2022 |
| **6** | Multiple catch clauses | ICT | 1 | T1, T2, R1 | 2-10-2023 |
| **7** | Nested try statements, throw, throws | ICT | 1 | T1, T2, R1 | 2-10-2023 |
| **8** | finally, Java Built-in Exceptions | ICT | 1 | T1, T2, R1 | 3-10-2023 |
| **9** | Creating user- defined exceptions | ICT | 1 | T1, T2, R1 | 4-10-2023 |
| **UNIT III**  **Packages, Interfaces and Multithreading** | | | | | |
| **1** | Packages: Basics, Access protection, Importing Packages | ICT | 2 | T1, T2, R1 | 11-10-2023 |
| **2** | Creating and Importing User-defined Packages | ICT | 1 | T1, T2, R1 | 16-10-2023 |
| **3** | Interfaces: Declaring, Implementing and Extending Interfaces, using static methods in an Interface | ICT | 1 | T1, T2, R1 | 16-10-2023 |
| **4** | using final keyword in interfaces, Multithreaded Programming: Multithreading in Java | ICT | 1 | T1, T2, R1 | 17-10-2023 |
| **5** | The Java Thread Model | ICT | 1 | T1, T2, R1 | 18-10-2023 |
| **6** | Life Cycle of a Thread, the main thread, Creating Thread | ICT | 1 | T1, T2, R1 | 30-10-2023 |
| **7** | Creating Multiple Threads | ICT | 1 | T1, T2, R1 | 30-10-2023 |
| **8** | Thread Priorities, Synchronization, Inter Thread Communication, Suspending | ICT | 2 | T1, T2, R1 | 1-11-2023 |
| **9** | resuming and stopping threads | ICT | 1 | T1, T2, R1 | 2-11-2023 |
| **10** | Obtaining a thread state, the finalize () method | ICT | 1 | T1, T2, R1 | 7-11-2023 |
| **UNIT IV**  **Collections Framework & Introduction to AWT** | | | | | |
| **1** | Collections Framework: Overview & Introduction to AWT, Collection Interfaces | ICT | 2 | T1, T2, R1 | 8-11-2023 |
| **2** | Collection Classes | ICT | 2 | T1, T2, R1 | 9-11-2023 |
| **3** | Working with Maps, Comparators | ICT | 1 | T1, T2, R1 | 14-11-2023 |
| **4** | Introduction to AWT: Graphics and Text AWT Classes, Windows fundamentals | ICT | 1 | T1, T2, R1 | 14-11-2023 |
| **5** | frame windows | ICT | 2 | T1, T2, R1 | 15-11-2023 |
| **6** | creating and displaying information within a window Graphics, Color, Fonts | ICT | 2 | T1, T2, R1 | 16-11-2023 |
| **7** | Managing text output using Font Metrics | ICT | 1 | T1, T2, R1 | 21-11-2023 |
| **UNIT V**  **Introduction to AWT, Event Handling, Swings** | | | | | |
| **1** | Event Handling in Java: The Delegation Event Model | ICT | 1 | T1, T2, R1 | 22-11-2023 |
| **2** | Event Classes and Event Listener Interfaces | ICT | 1 | T1, T2, R1 | 23-11-2023 |
| **3** | AWT Controls, Layout Managers, and Menus: AWT Control Fundamentals, Labels, Buttons, Check Boxes | ICT | 1 | T1, T2, R1 | 28-11-2023 |
| **4** | Checkbox Groups, Choice Controls, Lists, Scroll Bars | ICT | 1 | T1, T2, R1 | 28-11-2023 |
| **5** | TextField and TextArea | ICT | 1 | T1, T2, R1 | 29-11-2023 |
| **6** | Layout Managers, Menu Bars and Menus | ICT | 1 | T1, T2, R1 | 05-01-2024 |
| **7** | Dialog Boxes, File Dialog | ICT | 1 | T1, T2, R1 | 06-01-2024 |
| **8** | Swings: Swing Features, MVC Connection | ICT | 1 | T1, T2, R1 | 11-01-2024 |
| **9** | Components and Containers | ICT | 1 | T1, T2, R1 | 12-01-2024 |
| **10** | JLabel, ImageIcon, JTextField | ICT | 1 | T1, T2, R1 | 12-01-2024 |
| **11** | Swing Buttons, Check Boxes, Radio Buttons, JTabbedPane | ICT | 1 | T1, T2, R1 | 18-01-2024 |
| **12** | JScrollPane, JList | ICT | 1 | T1, T2, R1 | 18-01-2024 |
| **13** | JComboBox | ICT | 1 | T1, T2, R1 | 19-01-2024 |
| **14** | JTree, and JTable | ICT | 1 | T1, T2, R1 | 20-01-2024 |

**7. Additional Topics:**

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| **S. No.** | **Topic** | **Course Outcome** |
| **1** |  |  |
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**8. Course Assessment & Evaluation:**

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| **Mode of assessment** | **Frequency** | **Marks** |
| Mid-Term Examinations  (Internal) | Two exams CIE-1 and CIE-2 will be conducted. The consolidated CIE marks will be arrived by considering the marks secured by the student in both the CIEs with 80% weightage given to the better CIE and 20% to the other.  For each theory course, during the semester, there shall be two CAAs. Each CAA will be evaluated for 10 marks. The consolidated CAA marks will be arrived by considering the average of marks secured by the student in both the CAAs.  The final marks for CIA (for 40 marks) = Consolidated CIE marks (for 30 marks) + Consolidated CAA marks (for 10 marks) | 40 |
| Semester End Examinations (External) | Once | 60 |
| **Total** | | **100** |

**9. Mapping(X) of Course Outcomes with Program Outcomes & Program Specific Outcomes:**

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| **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | x |  | x |  |  |  |  |  |  |  |  |  |  | x |  |
| **CO2** |  |  | x |  |  |  |  |  |  |  |  |  |  | x |  |
| **CO3** |  |  | x |  |  |  |  |  |  |  |  |  |  | x |  |
| **CO4** |  |  | x |  |  |  |  |  |  |  |  |  |  | x |  |
| **CO5** |  |  | x |  |  |  |  |  |  |  |  |  |  | x |  |
| **CO6** |  |  | x |  |  |  |  |  |  |  |  |  |  | x |  |

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**Course Coordinator**