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| --- | --- | --- | --- | --- | --- |
| Subject Code  **20CST321** | **Project Based Learning in Java** | L | T | P | C |
| Total Contact Hours : 30Hours | 0 | 2 | 0 | 2 |
| Common to all Specializations of CSE 3rd Year |
| Prerequisite: Knowing Programming Language Java | | | | |

**Course Objectives**

1.To understand the use of Java in a variety of technologies and on different platforms.

2. Understand the server side programming

3.To understand the basic concepts and fundamentals of platform independent object oriented language.

4. To demonstrate skills in writing programs using exception handling techniques and multithreading.

5. To understand streams and efficient user interface design techniques.

### Course Outcomes

1. To gain knowledge of the structure and use the Java programming language for various technologies

2. Use the syntax and semantics of java programming language and basic concepts of OOP.

3. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.

4 . Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.

5. Design event driven GUI and web related applications which mimic the real word scenarios.

### Unit-I

Java Fundamentals: Introduction to Java. Difference between C++ and Java. Keywords, Tokens, Data types. Use of public, private and protected.

OOPS using Java: Use of class and method in Java. Inheritance, Abstraction, Polymorphism, Encapsulation and data privacy. Difference between method overloading and method overriding.

Exception Handing: Introduction to Exceptions. Difference between error and exception. Use of try, catch and throw. Difference between throw and throws. Types of Exceptions, Exception handling in Java.

### Unit-II

Collection Framework: Use of Collections in Java. ArrayList, LinkedList, HashMap, TreeMap, HashSet in Java.. Multithreading in Java. Thread Synchronization. Thread Priority, Thread LifeCycle.

Wrapper Classes, I/O Streams and Annotations: Use of wrapper classes in Java- Integer, Character, Long, Boolean. Autoboxing and Unboxing. Byte stream, Character stream, Object serialization, cloning. System defined annotations, Custom annotations, application of annotations, Testing using JUnit.

JDBC: Database connectivity, Types of Drivers for connection, Connection Example. CRUD operations using Database, Configuring various types of drivers for Java Database Connectivity, MVC Model for project development, Sequence, Dual table , Date type management in Java.

### Unit-III

Servlets and JSP: Servlet Lifecycle, Generic Servlet, Http Servlet, Linking Servlet to HTML, HttpServlet Request and Response, Servlet with JDBC, Configuring project using servlet, Servlet Config and Servlet Mapping JSP declaration, JSP directives, JSP Scriptlets, JSP include tag, JSP page tag, JSTL.

XML and Web Services: Structure of XML, Elements of XML 1.0, 2.0, DTDs, XML parser, DOM parser, Web services using REST and HTTP, Creating web services for database access via remote servers

### Text books:

1. Herbert Schildt, Java : The Complete Reference, 9th Edition, Oracle Press.
2. Gary Cornell, Core Java Volume II Advanced Features, 8th Edition, Pearson Education.
3. Jim Keogh, J2ee : Complete Reference, 1st Edition, Tata McGraw Hill.

### Reference books:

1. James Gosling, Ken Arnold and David Holmes, Java Programming Language, 5th Edition, Pearson Education.
2. Gary Cornell, Core Java Volume I, 3rd Edition, Pearson Education.

# Mode of Evaluation: The performance of students is evaluated as follows:

|  |  |  |
| --- | --- | --- |
|  | **Theory** | |
| **Components** | **Continuous Internal Assessment (CAE)** | **Semester End Examination (SEE)** |
| **Marks** | **40** | **60** |
| **Total Marks** | **100** | |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping Between COs and POs** | | |
| **SN** | **Course Outcome (CO)** | **Mapped Programme Outcome (PO)** |
| 1 | To understand the use of Java in a variety of technologies and on different platforms. | To gain knowledge of the structure and use the Java programming language for various technologies |
| 2 | Understand the server side programming | Use the syntax and semantics of java programming language and basic concepts of OOP. |
| 3 | To understand the basic concepts and fundamentals of platform independent object oriented language. | Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages |
| 4 | To demonstrate skills in writing programs using exception handling techniques and multithreading. | Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes. |
| 5 | To understand streams and efficient user interface design techniques. | Design event driven GUI and web related applications which mimic the real word scenarios. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | 3 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| **CO2** | 3 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| **CO3** | 3 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| **CO4** | 3 | 2 | 3 | – | – | – | – | – | – | – | – | – | – | 2 |
| **CO5** | 3 | 3 | 3 | 2 | – | – | – | – | – | – | – | – | – | 2 |
| **CO6** | 3 | 3 | 3 | 3 | – | – | – | – | – | – | – | – | – | 2 |

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|  |  | **Engineering Knowledge** | **Problem analysis** | **Design/development of solutions** | **Conduct investigations of complex** | **Modern tool usage** | **The engineer and society** | **Environment and sustainability** | **Ethics** | **Individual or team work** | **Communication** | **Project management and finance** | **Life-long Learning** |
| Course Code | Course Name | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **1**  **0** | **1**  **1** | **12** |
| **20CST321** | **Project Based learning in JAVA** |  |  |  |  |  |  |  |  |  |  |  |  |

1 = addressed to small extent

2 = addressed significantly

3 = major part of course