VIT-AP UNIVERSITY

Course title : **CSE2005**

Course title : **Object Oriented Programming**

Module : **0**

Topic : **0**

Zero Hour

Objectives

This session will give the knowledge about

- Course syllabus
- Objectives
- Course outcome
- CO's Mapping with PO's and PEO’s
- Couse plan

Objectives

1. To understand the concepts of object-oriented, event driven, and concurrent programming paradigms and develop skills by using these paradigms in Java.

2. To understand the principals of inheritance, dynamic polymorphism and interfaces.

3. To learn writing a computer program to solve specified problems.

4. To enable using the Java SDK environment to create, debug and run simple applications.

Expected Outcome

1. Understand the structure of the Java programming language
2. Identify classes, objects, members of a class, and relationships among them needed for a specific problem
3. Develop applications using Object Oriented programming principles and proper programming structuring
4. Develop Java programs to implement error handling techniques using exception handling
5. Develop and understand multithreaded applications with synchronization
6. Develop standalone applications using the JavaFX framework

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Course Outcomes

Course Outcomes	Course Outcome Statement	POs / PEOs
CO1	Understand the structure of the Java programming language	PO1 / PEO4
CO2	Identify classes, objects, members of a class, and relationships among them needed for a specific problem	PO1 / PEO4
CO3	Develop applications using Object Oriented programming principles and proper programming structuring	PO2, PO11 / PEO2
CO4	Develop Java programs to implement error handling techniques using exception handling	PO2, PO5 / PEO2
CO5	Develop and understand multithreaded applications with synchronization	PO3, / PEO3
CO6	Develop standalone applications using the JavaFX framework	PO2, PO3, PO5 / PEO3

Programme Outcomes (PO) (CSE-All Specialization)

After successful completion of the program a student is expected to have abilities to:

- **PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2. Problem analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Programme Outcomes (PO) (CSE-All Specialization)

- **PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Programme Outcomes (PO) (CSE-All Specialization)

- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- **PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Programme Outcomes (PO) (CSE-All Specialization)

- **PO8.Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9. Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Programme Outcomes (PO) (CSE-All Specialization)

- **PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12. Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Syllabus

Module No. 1 Object-Oriented Programming – Fundamentals 9 Hours

Features of OOP – Data types, variables, Array, Operators, String function, Control statements, Objects and Classes in Java – Defining Classes – Methods - Access Specifiers – Static Members – Constructors, this Keyword- Encapsulation. Inheritance: Inheritance Hierarchies- Super and Subclasses - access control - super keyword – final keyword-final classes and methods.

Syllabus

Module No. 2 Polymorphism, Packages and Interfaces 8 Hours

Polymorphism: dynamic binding, method overriding. Abstraction-abstract classes and methods. The Object class –Packages – Object Cloning – Inner Classes- Garbage Collection - Finalize Method. Interfaces - Interfaces vs. Abstract classes, defining an interface, implementing interfaces - extending interfaces.

Syllabus

Module No. 3 Exception Handling 6 Hours

Exceptions – Exception Hierarchy-– Throwing and Catching Exceptions-Multiple Catch Clause-Nested Try statement- throw-throws-finally- Built in exceptions - User Defined Exceptions.

Syllabus

Module No. 4 The Collections Framework and Generic Programming 8 Hours

Collection, overview, Collection interface –List, Set, Map, Collection Classes- Array List, HashSet, HashMap- Using an Iterator- For-Each- Comparators, Wrapper classes, Motivation for Generic Programming – Generic Classes and Methods – Bounded Types –Wildcard Arguments –Generic Constructors and Interfaces.

Syllabus

Module No. 5 Concurrent Programming 7 Hours

Multi-Threaded Programming – Process Vs Thread - Thread Life Cycle - Thread class – Runnable interface- Thread Creation- Interrupting Threads – Thread States – Thread Properties –-Thread Control and Priorities - Inter Thread Communication -Thread Synchronization – Synchronization.

Syllabus

Module No. 6 Introducing to JavaFX 7 Hours

JavaFX Basic Concepts – Event Basics – Drawing directly on Canvas – JavaFX Controls – Button – Checkbox – Label – List View – Radio Button – Scroll Pane – Text Field – Toggle Button – Tree View – Menu Basics

Syllabus

Text Books:

1. Herbert Schildt, “Java: The Complete Reference”, McGraw-Hill Education, Twelfth edition,2021.

Syllabus

Reference Books:

1. Kishori Sharan, Peter Späth “Learn JavaFX 17: Building User Experience and Interfaces with Java”, Apress Publication, 2nd Edition, 2022

2. Kathy Sierra, Bert Bates , Trisha Gee, “ Head First Java: A Brain-Friendly Guide”, Shroff Publishers & Distributor, Third Edition, June 2022

Mark Configuration

CAT-1: Module 1 and Module 2 – 20%

CAT-2: Module 3 and Module 4 – 20%

FAT: Module 5 and Module 6 and 10% from CAT portion – 20%

Non-CAT Assessment (15%):

Digital Assignment-1: 10 Marks

Attendance: 5 Marks

Lab Component (25%)

Summary

We have discussed about

- Course syllabus
- Objectives
- Course outcome
- CO's Mapping with PO's and PEO’s
- Couse plan