 **Annexure ‘CD – 01’**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **L** | **T** | **P/S** | **SW/FW** | **No. of PSDA** | **TOTAL CREDIT UNITS** |
| 3 | 0 | 0 | 0 | 0 | 3 |

# Course Title: OBJECT ORIENTED SYSTEM DESIGN Credit Units: 3

**Course Level: UG**

**Course Code: CSE431**

**Course Objectives:** The purpose of this module is to acquaint students with key aspects of object-oriented principles and systems modeling. It also aims to give students skills in the use of appropriate tools and familiarity with techniques applied at different stages of the software development lifecycle. Object oriented concepts have been the backbone of software solution design across platform such as embedded, internet and business solution. Over the years the market is growing stronger and bigger size. Meanwhile, the need for reliable and scalable software solution design is ever-increasing. Hence, the skilled professionals with good foundation of object oriented concepts are needed to fulfill the ever increasing requirements.

**Pre-requisites:** Object oriented programming, Software Engineering, Software Project Management.

**Course Contents/Syllabus:**

|  |  |
| --- | --- |
|  | **Weightage (%)** |
| **Module I : Object Oriented Design** | **20%** |
| **Descriptors/Topics**   * Introduction to OOSD – What is OOSD? * What is UML? What are the Unitedprocess(UP) phases * Case study – the NextGen POS system, Inception * Use caseModeling * Relating Use cases * include, extend and generalization. |
| **Module II Systems modelling using the object oriented approach and UML** | **20%** |
| **Descriptors/Topics**   * Elaboration - Domain Models – * Finding conceptual classes and description classes * Associations – Attributes – Domain model refinement * Finding conceptual class hierarchies- Aggregation and Composition- * UML activity diagrams and modeling, * Scenario based examples for system modeling using object oriented approach. |
| **Module III Diagrams** | **20%** |
| **Descriptors/Topics**   * System sequence diagrams * Relationship between sequence diagrams and use cases * Logical architecture and UML package diagram , Logical architecture refinement * UML class diagrams * UML interaction diagrams * UML deployment and component diagrams |
| **Module IV** object oriented system design | **20%** |
| **Descriptors/Topics**   * Design Issues, Unified Approach to design, Partitioning of analysis model * Concurrency and subsystem allocation, task management component. * User interface component, Data management component, Resource management component * Inter-subsystem, Communication, Object description, Data structure, Component and interfaces * Design Patterns and reuse * Elaboration and implementation of Use cases Class * Object collaboration, Interaction, STD diagram and modeling – Operation contracts- Mapping design to code etc |
| **Module V** GRASP & UML | **20%** |
| **Descriptors/Topics**   * GRASP: Designing objects with responsibilities ,Creator , Information expert * Low Coupling –Controller – High Cohesion, Designing for visibility * Applying GoF design patterns – adapter, singleton, factory and observer patterns. * UML deployment and component diagrams * Tools for business requirement |

**Course Learning Outcomes:**

* Understanding the concept of OOSA & OOSD with UML.
* Create structure diagrams addressing a clearly defined problem
* Apply OOSD techniques to implement behavioral diagrams.
* Able to design real world problems using OOSD components
* Design software system with responsibility and design pattern concepts

**Pedagogy for Course Delivery:**

Remote teaching will take place for the subject, the topics will be discussed with the help of case presentations.

**List of Professional Skill Development Activities (PSDA):**

**NA**

**Lab/ Practical details, if applicable: NA**

**List of Experiments:**

**Assessment/ Examination Scheme:**

|  |  |
| --- | --- |
| **Theory L/T (%)** | **Lab/Practical/Studio (%)** |
| 100 | **NA** |

**Theory Assessment (L&T):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Continuous Assessment/Internal Assessment**  **(30 %)** | | | | | | **End Term Examination**  **(70%)** |
| **Components (Drop down)** | | Mid-Term Exam | Presentation | Case study/assignment | Quiz | Attendance |  |
| **Linkage of PSDA with Internal Assessment Component, if any** | |  |  |  |  |  |  |
| **Weightage (%)** | | 15% | 5% | 10% | 5% | 5% | 60  % |

**Lab/ Practical/ Studio Assessment: NA**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Continuous Assessment/Internal Assessment**  **(\_\_\_\_ %)** | | | | **End Term Examination**  **(\_\_\_\_ %)** | | |
| **Components (Drop down** |  |  |  |  |  |  |  |
| **Weightage (%)** |  |  |  |  |  |  |  |

**Text Reading:**

* Craig Larman,"Applying UML and Patterns: An Introduction to object-oriented Analysis and Design and iterative development”, Third Edition, Pearson Education, 2005
* James Rambaugh, Ivar Jacubson, Grady Booch “Unified modeling language reference manual”, Addison Wiley, 1995

**References:**

* Mike O’Docherty, “Object-Oriented Analysis & Design: Understanding System Development with UML 2.0”, John Wiley & Sons, 2005.
* James W- Cooper, Addison-Wesley, “Java Design Patterns – A Tutorial”, 2000.
* MichealBlaha, James Rambaugh, “Object-Oriented Modeling and Design with UML”, Second Edition, Prentice Hall of India Private Limited, 2007
* Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides,“Design patterns: Elements of Reusable object-oriented software”, Addison-Wesley, 1995, Inc., 1981, Los Altos, CA.

**Additional Reading:**

**Any other Study Material:**