|  |  |
| --- | --- |
| MONO | **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  **NATIONAL INSTITUTE OF TECHNOLOGY PATNA**  Ashok Raj Path, PATNA 800 005 (Bihar), India |
| Phone No.: 0612 – 2372715, 2370419, 2370843, 2371929, 2371930, 2371715 Fax – 0612- 2670631 Website: [www.nitp.ac.in](http://www.nitp.ac.in) |

***CSX460* Object Oriented Systems Development**

**L-T-P-Cr: 3-0-0-3**

**Pre-requisites:** None

**Objectives/Overview:**

* To delves into the processes of both object-oriented analysis and object-oriented design using UML as the notation language to provide a common, standard notation for recording both analysis models and design artifacts.
* To cover facets of the Unified Process approach to designing and building a software system.

**Course Outcomes:**

At the end of the course, a student should come to know:

|  |  |  |
| --- | --- | --- |
| **S.NO.** | **Outcome** | **Mapping to POs** |
| CO-1 | Learn broad understanding of object oriented technology and architecture. Understand the development of object oriented systems. Learn about software development life cycle. | PO-1 |
| CO-2 | Learn about three main methodologies in Object Oriented architecture, and will also learn about patterns and frameworks. | PO-3 |
| CO-3 | Learn the basic concepts of object oriented modelling. | PO-5 |
| CO-4 | Learn about objects and class concepts, link and association, Generalization and Inheritance, Abstract class metadata, constraints which is used to create structure of any modern application. | PO-3 |
| CO-5 | Learn about transition and conditions, state diagram, state diagram behavior. This will help to create a model which shows the state in which the system resides and help create stable systems rapidly. | PO-3, PO-5 |
| CO-6 | Learn the basics of use case diagrams, sequence diagram, activity models and data flow diagram. | PO-11, PO-3 |
| CO-7 | Learn in detail about development lifecycles and different stages in domain and application analysis. | PO-3, PO-11 |
| CO-8 | Learn the basic estimating system performance and handling data management. | PO-12, PO-2 |
| CO-9 | Learn the basic of class design, refactoring and optimization of a class. | PO-3 |

**UNIT 1: Introduction Lectures: 4**

About Object Orientated Technology, Development and OO Modeling History. SDLC, Software development process, OO Systems development: A use case driven approach.

**UNIT 2:** **Object Oriented Methodologies Lectures: 4**

Rambaugh et al.’s OMT, The Booch Methodology, The Jacobson et al Methodologies, Patterns, Frameworks, The Unified Approach.

**UNIT 3: Modeling Concepts Lectures: 4**

Modeling design Technique, Three models, Class Model, State model and Interaction model.

**UNIT 4: Class Modeling Lectures: 5**

Object and class concepts, link and association, Generalization and Inheritance, Advanced class modeling- aggregation, Abstract class metadata, constraints.

**UNIT 5: State Modeling Lectures: 5**

Event, state, Transition and conditions, state diagram, state diagram behavior, concurrency, Relation of Class and State models, nested state diagrams.

**UNIT 6: Interaction & Functional Modeling Lectures: 5**

Use case Models, sequence models, activity models, DFD, Features of DFD, Advantages & Disadvantages of DFD, synchronous and asynchronous DFD

**UNIT 7: Domain & Application Analysis Lectures: 5**

Development Life cycle, Development stages, Domain Analysis-Domain class model, domain state model, domain interaction model, Iterating and analysis. Application Interaction model, Application class model, Application state Model, Adding operation.

**UNIT 8: System Design Lectures: 5**

Estimating Performance, making a reuse plan, breaking system into subsystems, identifying concurrency, allocation of subsystems, management of data storage, Handling Global resources, choosing a software control strategy, Handling boundary condition, common Architectural style.

**UNIT 9: Class Design Lectures: 5**

Overview of class design, designing algorithms recursing downward, refactoring, design optimization, Adjustment of Inheritance, Reification of Behavior.

**Text/ Reference Book:**

1. Michael R Blaha, James R Rumbaugh, “*Object-Oriented Modeling and Design with UML*”, Pearson Education.
2. Ali Bahrami, “*Object Oriented Systems development using the Unified Modeling Language*”, McGraw Hill.
3. Grady Booch, James Rumbaugh, Ivar Jacobson, “*The Unified Modeling Language*”, Pearson Education.
4. Grady Booch, “*Object Oriented Analysis and Design*”, Pearson Education.
5. Graig Larman, “*Applying UML and Patterns*”, Addison Wesley.
6. Perdita Stevens, Rob Pooley, “*Using UML Software Engineering with Objects and Components*”,Pearson.