V SEMESTER: G 603.5: OBJECT ORIENTED ANALYSIS & DESIGN

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UNIT – 1

Introduction

object orientation concept, OO development concept – Modelling concept, OO methodology, Three methods, OO Themes – Abstraction, Encapsulation, Combining data & behaviour, Sharing , Emphasis on the essence of an Object, Synergy

Modeling as a design Technique

Modeling, Abstraction, The 3 models

Class modeling

Object and class concepts – Objects, Classes, Class diagram, Values & attributes, Operation and methods, Link and Association Concepts – Link and association, Multiplicity, Association and names, Ordering, Bags & Sequences, Association Class, Qualified Association, Generalization and Inheritance- Definition, Use of generalization, Overriding features

Advanced Class Modeling

Multiplicity, Association Ends, Aggregation, Aggregation versus Association, Aggregation versus Composition

generalization, overriding features

Advanced Class Modeling

Multiplicity, Association Ends, Aggregation, Aggregation versus Association, Aggregation versus Composition

Case Study: A Sample class model **12 HOURS**

UNIT – 2

State Modeling

Events – Signal event, Change event, Time event, States, Transistors and conditions

State Diagrams – Sample State Diagram, One shot state Diagrams, Summary of Basic state diagram notations, State Diagram Behavior – Activity Effects, Do Activities, Entry and Exit Activities, Completion Transition, Sending Signals

Interaction Modeling:

Use Case Models

Actors, Use Cases, Use case Diagram, Guidelines for use case models

Sequence Model: Scenarios, Sequence Diagram, ***Communication Diagram,*** Activity Model – Activities, Branches, Introduction & termination, Concurrent Activities, Executable Activity diagram, Guidelines for

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Advanced Interaction modeling

Use Case relationships- Include Relationships, Extend Relationship, Generalization, Combinations of use case relationships, Guidelines for use case relationships

Procedural Sequence Models- Sequence Diagrams with Passive Objects, Sequence Diagrams with Transient Objects, Guidelines for Procedural Sequence Models.

12 HOURS

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UNIT – 3

Part 2: Analysis and Design

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Part 2: Analysis and Design

Process Overview

Development Stages – System Conception, Analysis, System Design, Class Design, Implementation, Testing, Training, Deployment, Maintenance

System Design – Overview of System Design, Estimating Performance, Making a Reuse Plan – Library, Framework Pattern`Breaking a System into Sub-systems – Layers, Partitions, Combining Layers and Partitions, Identifying Concurrency – Identifying, inherent Concurrency, Defining Concurrent Tasks, Allocation of Sub-Systems – Estimating hardware Resource Requirement, Making Hardware and Software Trade-offs, Allocating Tasks to processors, Determining Physical Connectivity, Management of Data Storage, Handling Global Resources, Choosing a Software Controlled Strategy – Procedure Driven Control, Event Driven Control, Concurrent Driven Control, Internal Control, Other Paradigms, Handling Boundary Conditions, Setting Trade-off Priorities, Common Architectural Styles – Batch Transformation, Continuous Transformation, Interactive Interface, Dynamic Simulation, Real-time System, Transaction Manage 12 **HOURS**

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UNIT – 4

UNIT – 4

Class Design

Overview of Class Design, Bridging the Gap, Realizing Use Cases, Designing Algorithms – Choosing Algorithms, Choosing Data structures, Defining Internal classes and Operations, Assigning Operations to Classes, Recursing Downward – Functionality Layers, Mechanism Layers, Refactoring, Design Optimization – Adding Redundant associations for Efficient Access, Saving derived values to avoid Re-computation, Rectification of Behavior, Adjustment of Inheritance – Rearranging Classes and Operations, Abstracting out Common Behavior, Using Delegation to share Behavior

Organizing a Class Design – Information Hiding, Coherence of Entities, Fine Tuning Packages

Case Study – ATM, Library Management System (Class Diagram, Object Diagram ,Use case Diagram ,Sequence Diagram, Collaboration Diagram ,State Diagram ,Activity Diagram ,Component Diagram ,Deployment Diagram)

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12 HOURS

Text Book