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LESSON PLAN

Course: MCA-104 – Object Oriented Software Engineering	
MCA – 2nd Semester	No. of Theory Hours per Week: 04

Course Outcomes (COs):

CO #	Detailed Statement of the CO
CO1	Illustrate system modeling and architecture using UML. (BTL2)
CO2	Apply suitable iterative process model. (BTL3)
CO3	Analyze requirements with use cases. (BTL4)
CO4	Appraise, analyze and design artifacts. (BTL5)
CO5	Create domain models for analysis phase. (BTL6)
CO6	Design object solutions with patterns and architectural layers. (BTL6)

Recommended Books:

Books	S. No.	Details of the Books
Text Books	1.	John W. Satzinger, Robert B. Jackson and Stephen D. Burd, “Object Oriented Analysis and Design with Unified Process”, Cengage Learning, 1st Edition, 2014. [TB1]
	2.	Mike O’Docherty, “Object Oriented Analysis and Design”, Wiley, 1st Edition, 2013. [TB2]
	3.	Ivar Jacobson, Magnus Christerson, Patrick Jonsson and Gunar Overgaard, “Object Oriented Software Engineering-Use Case Driven Approach”, Pearson, 7th Impression, 2009. [TB3]
Reference Books	1.	Grady Booch, James Rumbaugh, Ivar Jacobson, “The UML User Guide”, Pearson, 2nd Edition, 2008. [RB1]
	2.	Craig Larman, “Applying UML and Patterns – An Introduction to Object-Oriented Analysis and Design and Iterative Development”, Pearson, 3rd Edition, 2016. [RB2]
	3.	Martin C Robert and Martin Micah, “Agile Principles, Patterns, and Practices in C#”, Pearson, 1st Edition, 2007. [RB3]
	4.	Yogesh Singh and Ruchika Malhotra, “Object Oriented Software Engineering”, PHI, 1st Edition, 2012. [RB4]

	5.	Mahesh P. Matha, “Object Oriented Analysis and Design using UML”, PHI, 1st Edition, 2008. [RB5]
	6.	Michael Blaha and James Rumbaugh, “Object Oriented Modelling and Design with UML”, Pearson, 2nd Edition, 2013. [RB6]

Lesson Plan for Theory:

Lecture No.	Topics/Concepts to be Covered	Reference of the Book and its Chapter
UNIT - I		
1.	Introduction to Object Oriented Concepts: Review of Objects and Classes.	TB1 [Chapter 2]
2.	Links and association, Generalization and specialization, Inheritance	TB1 [Chapter 2,5]
3.	Grouping concepts, aggregation, composition, abstracts classes	TB1 [Chapter 5]
4.	Polymorphism, Metadata, Constraints, Reuse	TB1 [Chapter 2], RB6 [Chapter 4]
5.	Object Oriented Methodologies: Introduction to Rational Unified Process	TB1 [Chapter 2], RB6 [Chapter 1]
6.	Comparison of Traditional Lifecycle Model vs Object Oriented lifecycle model	TB1 [Chapter 2]
7.	UML: Origin of UML, 4+1 view architecture of UML	RB6 [Chapter 1]
8.	Architecture: Introduction, System development is model building	TB1 [Chapter 9]
9.	model architecture, requirements model, analysis model	TB1 [Chapter 4]
10.	the design model, the implementation model, test model	TB1 [Chapter 2]
11.	Buffer Reserved for Revision	
UNIT – II		
12.	Project Management and Inception Phase: Project Management	TB1 [Chapter 11]
13.	the unified process and the inception phase	RB6 [Chapter 1]
14.	Project Monitoring and Control	TB1 [Chapter 11]
15.	Analysis: Introduction, the requirements model	TB1 [Chapter 11]
16.	the analysis model	TB1 [Chapter 11]
17.	use cases and domain classes	TB1 [Chapter 8]
18.	Use case modelling and Detailed Requirements	TB1 [Chapter 8]
19.	UML: Use case model, Activity Diagram	TB1 [Chapter 8]
20.	System sequence Diagrams	RB6 [Chapter 9]
21.	Object Diagrams, Domain Class Model Diagrams	TB1 [Chapter 5]

Lecture No.	Topics/Concepts to be Covered	Reference of the Book and its Chapter
22.	Buffer Reserved for Revision	
UNIT – III		
23.	Construction: Introduction, the design model	TB1 [Chapter 6]
24.	block design, working with construction	
25.	Use case realization: the design discipline within UP iterations	TB1 [Chapter 4]
26.	Designing the Subsystem: Mapping design to code,	TB1 [Chapter 6]
27.	Designing the data access layer, UI interfaces and system interfaces.	
28.	Reusable Design Patterns: Importance of design patterns	
29.	Basic design patterns –Singleton, Multiton	
30.	Iterator, Adapter, Observer	
31.	UML: Communication Diagrams, Design Class Diagram, State Transition Diagram	RB6 [Chapter 5]
32.	Package Diagram, Component Diagram and Deployment Diagram	RB6 [Chapter 5,10]
33.	Buffer Reserved for Revision	
UNIT - IV		
34.	Object Oriented Testing Techniques: Testing Terminology	TB1 [Chapter 10]
35.	Types of tests, Automatic Tests	
36.	Testing Strategies	
37.	Agile Process: Agile Manifesto	TB1 [Chapter 12]
38.	Agile Principles, Introduction to Extreme Programming	
39.	Scrum	
40.	Lean processes	
41.	Case Studies.	
42.	Buffer Reserved for Revision	

Course: MCA-164 –Object Oriented Software Engineering Lab.	
MCA – 2nd Semester	No. of Practical Hours per Week: 02

Course/Lab Outcomes (COs):

COs for Practical (MCA-164)

CO1	Apply object-oriented software engineering concepts to a project. (BTL3)
CO2	Analyzing and constructing models and diagrams in analysis phase. (BTL6)
CO3	Creating design model diagrams for design phase. (BTL3)
CO4	Use advanced CASE tool. (BTL6)
CO5	Work in teams to design practical solutions for real life case studies using UML. (BTL6)

Lesson Plan for Practical:

Week No.	Lab No.	Topics/Concepts to be Covered	Reference of Lab Manual
1.	1.	Use Case Diagrams	Q1-Q4, AQ1-AQ2
2.	2.	Class Diagram & Java Stub Code	Q5-Q6, AQ3-AQ4
3.	3.	Object Diagram & Package Diagram	Q7-Q9, AQ5-AQ6
4.	4.	Activity Diagram	Q10-Q11, AQ7
5.	5.	Sequence Diagram	Q12-Q13, AQ8
6.	6.	State Diagram	Q14-Q15, AQ9
7.	7.	Communication Diagram	Q16-Q17, AQ10
8.	8.	Component Diagram	Q18-Q19, AQ11
9.	9.	Deployment Diagram	Q20-Q21, AQ12
10.	10.	PERT Chart	Q22
11.	11.	Gantt Chart	Q23
12.	12.	Buffer Reserved for Revision	-

Testing Schedule:

Nature of Test	February	March	April	May
Surprise Test (ST)	ST in 3 rd week	ST in 2 nd week	-	-
Mid Term Test (MT)	-		MT in 1 st week	-
Class Test (CT)	CT in 4 th week		-	-
Supplementary Test (Sp. T)	-	-	-	Sp. T in 3 rd week
Assignment Submission Schedule	<p>Assignment-1 is to be submitted One Week after completion of Unit-1 and Unit-2.</p> <p>Assignment-2 is to be submitted One Week after completion of Unit-3.</p> <p>Assignment-3 is to be submitted One Week after completion of Unit-4.</p>			

Suggested Topics for Presentation:

S. No.	Suggested Topics for Presentation
1.	Classes & Objects
2.	Message Exchange in Classes
3.	Object-Oriented methodologies
4.	Object Composition
5.	Difficulties and Risk in Project Management
6.	PERT Chart
7.	Gantt Chart
8.	SCRUM Methodology
9.	Modeling interactions and behavior through state, activity and interaction diagrams
10.	SOLID Principles of Software Design
11.	Glass Box Testing Strategies
12.	Black Box Testing Strategies
13.	Xtreme Programming
14.	Agile Development
15.	System Development is Model Building

Suggested Topics for Group Discussion:

S. No.	Suggested Topics for Group Discussion
1.	Need of Architectural Design Patterns
2.	Failure of Waterfall Model
3.	An object is an abstract software model of a problem domain entity
4.	Benefits of Object-Oriented Design
5.	Reuse: building on the work and experience of others
6.	Use cases: describing how the user will use the system
7.	Difficulties and risks when creating class diagrams
8.	Fundamentals of Object-Oriented Design
9.	Iterative and agile development
10.	Strategies for testing large systems