

SEMESTER III

Course Code	PCA20C07J	Course Name	OBJECT ORIENTED ANALYSIS AND DESIGN	Course Category	C	Professional Core Course	L	T	P	C
							3	0	2	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)
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CLR-1 :	To understand the fundamentals of object modeling	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	To understand and differentiate Unified Process from other approaches.																		
CLR-3 :	To design with static UML diagrams.																		
CLR-4 :	To design with the UML dynamic and implementation diagrams																		
CLR-5 :	To improve the software design with design patterns.																		
CLR-6 :	To test the software against its requirements specification																		

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Disciplinary Knowledge	Critical Thinking	Problem Solving	Analytical Reasoning	Research Skills	Team Work	Scientific Reasoning	Reflective Thinking	Self-Directed Learning	Multicultural Competence	Ethical Reasoning	Community Engagement	ICT Skills	Leadership Skills	Life Long Learning
CLO-1 :	Express software design with UML diagrams.	3	80	70	L	H	H	H	H	M	-	H	M	H	-	H	-	-	-
CLO-2 :	Design software applications using OO concepts.	3	85	75	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	Identify various scenarios based on software requirements.	3	75	70	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	Transform UML based software design into pattern based design using design patterns	3	85	80	M	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	Understand the various testing methodologies for OO software	3	75	70	L	H	H	H	H	-	-	M	M	L	-	M	-	-	-
CLO-6 :	Apply the concepts of architectural design for deploying the code for software	3	85	80	M	H	H	H	H	-	-	H	M	L	-	H	-	-	-

Duration (hour)	15	15	15	15	15
S-1	SLO-1	Introduction to OOAD with OO Basics	Class Diagram	Dynamic Diagrams	GRASP: Designing objects with responsibilities
S-2	SLO-1	Unified Process	Elaboration – Domain Model	UML interaction diagrams	Creator – Information expert
S-3	SLO-1	UML diagrams-Basics	Finding conceptual classes	System sequence diagram-Basics	Low Coupling
					Object Oriented Methodologies
					Software Quality Assurance
					Impact of object orientation on Testing

	SLO-2	UML diagrams	Finding description classes.	System sequence diagram	High Cohesion	Impact of object orientation on Testing - Feedback
S-4-S-5	SLO-1	Lab 1:Case study – the Next Gen POS system	Lab 4: Identify use cases	Lab7: Using the identified scenarios, find the interaction between objects and represent them using UML	Lab 10: Implement the system as per the detailed design.	Lab 13:Improve the reusability and maintainability of the software system
S-6	SLO-1	Use Case	Associations – Attributes	Collaboration diagram – When to use Communication Diagrams	Controller ,Design Patterns	Develop Test Cases and Test Plans
S-7	SLO-1	Inception -Use case Modelling	Domain model refinement	State machine diagram and Modelling –When to use State Diagrams	creational – factory method	APPLICATIONS-Satellite Based Navigation
S-8	SLO-1	Relating Use cases	Finding conceptual class Hierarchies	Activity diagram – When to use activity diagrams	Adapter – behavioural	Traffic Management
S-9-S10	SLO-1	Lab 2 :Identify a software system that needs to be developed.	Lab 5: Develop the Use Case model	Lab 8:Sequence and Collaboration Diagrams.	Lab 11: package diagrams -Component and Deployment Diagrams.	Lab 14 By applying appropriate design patterns.
S-11	SLO-1	include, extend and generalization.	Aggregation and Composition	Implementation Diagrams - UML package diagram	Strategy – observer	Crypt Analysis
S-12	SLO-1	When to use Use-cases	- Relationship between sequence diagrams and use cases	When to use package diagrams - Component and Deployment Diagrams	Applying GoF design patterns	Weather Monitoring Station,
S-13	SLO-1	UML modeling tool	When to use Class Diagrams	When to use Component and Deployment diagrams	Mapping design to code	Vacation Tracking System.
S-14-15	SLO-1	Lab 3: Document the Software Requirements Specification (SRS) for the identified system.	Lab 6: Identify the conceptual classes and develop a Domain Model and also derive a Class Diagram from that.	Lab 9: Draw relevant State Chart and Activity Diagrams for the same system	Lab 12: Test the software system for all the scenarios identified as per the use case diagram.	Lab 15: Implement the modified system and test it for various scenarios. SUGGESTED DOMAINS FOR MINI-PROJECT: 1.Passport automation system. 2. Book bank 3. Exam registration 4. Stock maintenance system. 5.Online course reservation system

Learning Resources	1. Craig Larman, – <i>Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development</i> , Third Edition, Pearson Education, 2005. 2. Ali Bahrami - <i>Object Oriented Systems Development - McGraw Hill International Edition</i> – 1999.	1. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, – <i>Design patterns: Elements of Reusable Object-Oriented Software</i> , Addison-Wesley, 1995. 2. Martin Fowler, – <i>UML Distilled: A Brief Guide to the Standard Object Modeling Language</i> , Third edition, Addison Wesley, 2003.
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Learning Assessment											
Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	20%	20%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	10%	10%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

CLA-1, CLA-2 and CLA-3 can be from any combination of these: Online Aptitude Tests, Classroom Activities, Case Studies, Poster Presentations, Power-point Presentations, Mini Talks, Group Discussions, Mock interviews, etc.

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	Mr.D.B.Shanmugam, SRMIST
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