COURSE OUTLINE

Course Code	IT-325
Course Title	Object Oriented Analysis and Design
Credit Hours	3
Prerequisite	• Knowledge and Experience in Object Oriented Programming • Software Engineering Processes
Amis and Objectives	• Critically analyze and apply a range of concepts, principles, and practices of the subject in the context of loosely specified problems, showing effective judgment in the selection and use of tools and techniques. • Produce work involving problem identification, analysis, design, and development of a software system, along with appropriate documentation. The work must show some problem-solving and evaluation skills drawing on some supporting evidence and demonstrate a requisite understanding of and appreciation for quality. • Requirements: Identify and analyze criteria and specifications appropriate to specific problems, and plan strategies for their solution. • Design and Implementation: Specify, design, and implement computer-based systems. • Appreciation of the interplay between theory and practice. • Significant project experience. • Knowledge and understanding: Demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to computer science and software applications. • Understand and apply essential concepts, principles, and practices in the context of well-defined scenarios, showing judgment in the selection and application of tools and techniques. • Understanding of unification and RUP • Analysis and design of object oriented
Learning Outcomes	• Drawing differences in different industrial project development standards. • Be able of implementing analysis of real world objects to software objects and their designing. • Able enough to implement basic design principles in software applications.
Text Book	Craig Larman “Applying UML and design patterns”, 2nd Edition

Week	Lecture	Topic	Source Book-Chapter No. Section No.	Recommendations for Learning Activities (mention Assignments, Test, Quizzes, Practical, Case Study, Projects, Lab Work or Reading Assignments)
1	1	• Introduction of the course; Overview of pre-requisite concepts/knowledge. • Object Oriented Concepts	1.1, 1.2	• Distribution of course outline
	2	• Object Oriented Analysis & Design Basics	1.3, 1.4, 1.5	• Test for the evaluation of pre-requisite knowledge • Class Assignment
2	3	• Introduction to UML, Unification, UML Diagrams • Unified Process & Rational Unified Process • RUP disciplines • Case Study analysis and basics • Case Study	1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2	• Case Study
	4	• About Inception • Feasibility and Risk Analysis	4.1, 4.2, 4.3	• Assignment-1
3	5	• Understanding Requirements • Requirements types	5.1	• Notes
	6	• Usecase Modeling: Usecase writing styles • EBP guidelines	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8	• Case Study • Quiz-1 • Due Assignment-1
4	7	• System usecase diagram, Usecase table • Activity Diagram • Supplementary specifications, Vision Document, Glossary	6.9, 6.12, 6.13, 6.16, 6.17, 7.2, 7.3, 7.4, 7.7	• Case Study • Quiz-1 • Project Assignment-1
	8	• Rational Rose overview	6.12, 6.13	• Practical • Lab Work

		• Usecase & Activity diagram modeling in Rose		
5	9	• About Elaboration, Configuration Management • System Sequence Diagram	8.2, 8.3, 8.5, 9.2, 9.3, 9.4	• Case Study • Handouts
	10	• Identifying business classes • Domain Model Associations • Domain Model Attributes	10.1, 10.2, 10.4, 11.1, 11.2, 11.3, 11.4, 11.7, 12.1, 12.3, 12.4	• Case Study • Assigment-2
6	11	• Implementation of System sequence & Domain model in Rose	11.10, 12.9	• Practical • Lab Work
	12	• Usecase Operational Contracts • Business Sequence, Analysis Sequence & Collaboration Diagrams	13.1, 13.2, 13.9, 15.1, 15.5, 15.6, 15.7	• Case Study • Handouts
7	13	• Usecase dependencies • Analysis usecase diagram	25.1, 25.2, 25.3, 25.4, 25.5	• Case Study • Due Assignment-2
	14	• Implementation of Sequence , Collaboration, Analysis usecase diagram in Rose	15.6, 15.7, 25.5	• Practical • Lab work
8	15	• State chart diagrams and implementation in Rose	29.1, 29.2, 29.4, 29.5, 29.8	• Case Study • Quiz-2
	16	• Pre Mid Term Revision	CH 1-13, 15, 25, 29	• Course Revision
9	17	• About Design Patterns • GRASP: Information Expert	16.1, 16.2, 16.3, 16.4, 16.5, 16.6	• Due Project-1
	18	• GRASP: Creator, Cohesion & Coupling, Controller	16.7, 16.8, 16.9, 16.10	• Case Study • Handouts

10	19	• Usecase Realization using GRASP Patterns	17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.9	• Case Study • Handouts
	20	• Design Model: Determining Visibility	18.1, 18.2, 18.3	• Case Study • Handouts
11	21	• Modeling Generalization	26.1, 26.2, 26.4, 26.6, 26.7, 27.1, 27.2, 27.4, 27.5, 27.6, 27.7, 27.8, 27.10	• Case Study • Handouts
	22	• Creating Design Class Diagram • Mapping Data Model to Domain Model	19.1, 19.4, 19.5, 19.6, 34.5, 34.6, 34.7, 34.8, 34.9	• Project Assignment-2
12	23	• Implementation of Design Class Diagram in Rose	19.6	• Practical • Lab work
	24	• Coding patterns • Mapping Design to Code	20.1, 20.2, 20.3, 20.4, 20.5, 20.7, 20.9, 20.11	• Case Study • Handouts
13	25	• More Patterns for Assigning Responsibilities, Polymorphism, Pure Fabrication • Indirection, Protected Variation	22.1, 22.2, 22.3, 22.4	• Case Study • Handouts
	26	• GoF Design Patterns: Adapter, Factory	23.1, 23.2	• Assignment-3
14	27	• GoF: Singleton, Strategy	23.4, 23.5, 23.6	• Case Study
	28	• GoF: Composition, Façade	23.7, 23.8	• Case Study
15	29	• Refining Domain Model	28.1, 28.2	• Due Assignment-3 • Quiz-3
	30	• Pre Final revision	CH 16-20, 22, 23, 27, 28, 34	• Due Project Assingment-2

16	31	• Project Presentation		• Demo, Viva, Presentation
	32	• Project Presentation		• Demo, Viva, Presentation