INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad -500 043

COMPUTER SCIENCE AND ENGINEERING

COURSE DESCRIPTOR

Course Title	OBJECT ORIENTED ANALYSIS AND DESIGN PATTERNS LABORATORY				
Course Code	ACS108				
Programme	B.Tech				
Semester	VI	CSE			
Course Type	Core				
Regulation	IARE - R16				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	-	-	-	3	2
Chief Coordinator	Ms. N Shalini, Assistant Professor				
Course Faculty	Mr. R M Noorullah, Associate Professor Dr. Y Mohana Roopa, Professor Mr. C Raghavendra, Assistant Professor				

I. COURSE OVERVIEW:

The Unified Modeling Language is a graphical language for visualizing, specifying, constructing and documenting the artifacts of a software intensive system. The UML gives you a standard way to write systems blueprints covering conceptual things such as business processes and system functions as well as concrete things such as classes written in a specific programming language database schemas and reusable software components. Learn what the UML is what it is not and why the UML is relevant to the process of developing software intensivesystems.

II. COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites	Credits
UG	ACS003	III	Object Oriented Programming through JAVA	4
UG	ACS008	V	Software Engineering	4

III. MARKSDISTRIBUTION:

Subject	SEE Examination	CIA Examination	Total Marks
Object Oriented Analysis And Design Patterns Laboratory	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONALMETHODOLOGIES:

✘	Chalk & Talk	✘	Quiz	✘	Assignments	✘	MOOCs
✔	LCD / PPT	✘	Seminars	✘	Mini Project	✘	Videos
✘	Open Ended Experiments						

V. EVALUATIONMETHODOLOGY:

Each laboratory will be evaluated for a total of 100 marks consisting of 30 marks for internal assessment and 70 marks for semester end lab examination. Out of 30 marks of internal assessment, continuous lab assessment will be done for 20 marks for the day to day performance and 10 marks for the final internal lab assessment.

Semester End Examination (SEE): The semester end lab examination for 70 marks shall be conducted by two examiners, one of them being Internal Examiner and the other being External Examiner, both nominated by the Principal from the panel of experts recommended by Chairman, BOS.

The emphasis on the experiments is broadly based on the following criteria:

20 %	To test the preparedness for the experiment.
20 %	To test the performance in the laboratory.
20 %	To test the calculations and graphs related to the concern experiment.
20 %	To test the results and the error analysis of the experiment.
20 %	To test the subject knowledge through viva – voce.

Continuous Internal Assessment (CIA):
CIA is conducted for a total of 30 marks (Table 1), with 20 marks for continuous lab assessment during day to day performance, 10 marks for final internal lab assessment.

Table 1: Assessment pattern for CIA

Component	Laboratory		Total Marks
Type of Assessment	Day to dayperformance	Final internal lab assessment	
CIA Marks	20	10	30

Continuous Internal Examination(CIE):
One CIE exams shall be conducted at the end of the 16th week of the semester. The CIE exam is conducted for 10 marks of 3 hoursduration.

Preparation	Performance	Calculations and Graph	Results and Error Analysis	Viva	Total
2	2	2	2	2	10

VI. HOW PROGRAM OUTCOMES AREASSESSED:

	Program Outcomes (POs)	Strength	Proficiency assessed by
PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	3	Videos
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences**.**	3	Case studies
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, andenvironmental considerations	2	Videos

3 = High; 2 = Medium; 1 = Low

VII. HOW PROGRAM SPECIFIC OUTCOMES AREASSESSED:

	Program Specific Outcomes (PSOs)	Strength	Proficiency assessed by
PSO 1	**Professional Skills:** The ability to research, understand and implement computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient analysis and design of computer-based systems ofvarying complexity.	2	Videos
PSO 2	**Problem-Solving Skills:** The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.	3	Case studies
PSO 3	**Successful Career and Entrepreneurship:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths, to be an entrepreneur, and a zest for higher studies.	1	Videos

3 = High; 2 = Medium; 1 = Low

VIII. COURSE OBJECTIVES:

The course should enable the students to:	
I	Design use cases and develop the use case model.
II	Capture a business process model.
III	Practice the object oriented analysis and design through UML on a particular application
IV	Explore tools that support UML and object oriented software development.

IX. COURSE OUTCOMES:

COs	Course Outcome	CLOs	Course Learning Outcome
CO 1	Understand Object Oriented and UML concepts	CLO 1	Demonstrate the Conceptual model of UML and SDLC.
		CLO 2	Define classes modeling techniques and instances modeling techniques.
		CLO 3	Analyze the Objects and Classes are required for the development of software system.
CO 2	Apply advanced behavioral modeling techniques in design and drawing UML diagrams for various systems	CLO 4	Describe interaction diagrams and their modeling techniques.
		CLO 5	Creation of interaction diagram that model the dynamic aspects of a software system.
CO 3	Apply architectural modeling techniques in design and drawing UML diagrams for different systems	CLO 6	Use case and activity studies to illustrate the analysis and design concepts.
		CLO 7	Demonstrate activity diagram and their modeling techniques
		CLO 8	Demonstrate component and deployment diagram
		CLO 9	Identify, analyze, and model behavioral concepts of the system and also know the importance of events and signals and their modeling techniques.
CO 4	Create design solutions for design problems by using ERASP and GOF patterns	CLO 10	Analyze and understand the uses of process and threads and time and space to model and development of a system.
		CLO 11	Demonstrate state machines and state chart diagrams and their modeling techniques
CO 5	Apply design patterns for some case studies	CLO 12	Illustrate the uses of component and deployment diagram and their modeling techniques
		CLO 13	Analyze the Objects and Classes are required for the development of software system.

X. COURSE LEARNING OUTCOMES(CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
ACS108.01	CLO 1	Demonstrate the Conceptual model of UML and SDLC.	PO 1	3
ACS108.02	CLO 2	Define classes modeling techniques and instances modeling techniques.	PO 1	3
ACS108.03	CLO 3	Analyze the Objects and Classes are required for the development of software system.	PO 1	3
ACS108.04	CLO 4	Describe interaction diagrams and their modeling techniques.	PO 1	3

ACS108.05	CLO 5	Creation of interaction diagram that model the dynamic aspects of asoftware system.	PO 2	3
ACS108.06	CLO 6	Use case and activity studies to illustrate the analysis and design concepts.	PO 2	3
ACS108.07	CLO 7	Demonstrate activity diagram and their modeling techniques	PO 1	2
ACS108.08	CLO 8	Demonstrate component and deployment diagram	PO 1,PO 2,PO 3	2
ACS108.09	CLO 9	Identify, analyze, and model behavioral concepts of the system and also know the importance of events and signals and their modeling techniques.	PO 1, PO 2	3
ACS108.10	CLO 10	Analyze and understand the uses of process and threads and time and space to model and development of a system.	PO 2	3
ACS108.11	CLO 11	Demonstrate state machines and state chart diagrams and their modeling techniques	PO 1	3
ACS108.12	CLO 12	Illustrate the uses of component and deployment diagram and their modeling techniques.	PO 1	3
ACS108.13	CLO 13	Analyze the Objects and Classes are required for the development of software system.	PO 1	3

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XI. MAPPING COURSE LEARNING OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFICOUTCOMES:

Course Learning Outcomes (CLOs)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO 1	3												2		
CLO 2	3													3	
CLO 3	3												2		1
CLO 4	3													3	

Course Learning Outcomes (CLOs)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO 5		3											2		
CLO 6		3												3	
CLO 7	2												2		1
CLO 8	2	2	3											3	
CLO 9	2	2											2		
CLO 10		3												3	
CLO 11	3												2		
CLO 12	3													3	
CLO 13	3													3	

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XII. ASSESSMENT METHODOLOGIES –DIRECT

CIE Exams	PO 1,PO 2,PO ,PSO 1,PSO 2, PSO 3	SEE Exams	PO 1, PO 2, PO 3, PSO 1, PSO 2,PSO 3	Assignments	-	Seminars	-
Laboratory Practices	PO 1,PO 2,PO 3, PSO 1,PSO 2, PSO 3	Student Viva	PO 1, PO 2, PO 3, PSO 1, PSO 2,PSO 3	Mini Project	-	Certification	-

XIII. ASSESSMENT METHODOLOGIES -INDIRECT

✔	Early Semester Feedback	✔	End Semester OBE Feedback
✘	Assessment of Mini Projects by Experts		

XIV. SYLLABUS

LIST OF EXPERIMENTS	
Week-1	**SOFTWARE REQUIREMENTS SPECIFICATION**
Introduction to UML Diagrams. Create SRS for Recruitment System	
Week-2	**USE CASE DIAGRAM**

a. Passport AutomationSystem
b. Book bank managementsystem
c. Online course reservationsystem
d. Foreign tradingsystem
e. Conference ManagementSystem
f. BPO ManagementSystem

Week-3	ACTIVITY DIAGRAM

a. Passport AutomationSystem b. Book bank managementsystem c. Online course reservationsystem d. Foreign tradingsystem e. Conference ManagementSystem f. BPO ManagementSystem	
Week-4	**DOMAIN MODEL**
Identity the conceptual classes and Develop a domain model with UML Class diagram forpassport automation system	
Week-5	**SCENARIOS**
Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.	
Week-6	**STATE CHART DIAGRAM**
Draw a state chart diagram for a. Passport AutomationSystem b. Book bank managementsystem c. Online course reservationsystem	
Week-7	**STATE CHART DIAGRAM**
a. Foreign tradingsystem b. Conference ManagementSystem c. BPO ManagementSystem	
Week-8	**ARCHITECTURE DIAGRAM**
Identify the User Interface, Domain objects, and Technical services	
Week-9	**ARCHITECTURE DIAGRAM**
Draw the partial layered, logical architecture diagram with UML package diagram notation	
Week-10	**COMPONENT DIAGRAM**
Draw a Component diagram for a. Passport AutomationSystem b. Book bank managementsystem c. Online course reservationsystem	
Week-11	**COMPONENT DIAGRAM**
Draw a Component diagram for a. Foreign tradingsystem b. Conference ManagementSystem c. BPO ManagementSystem	
Week-12	**DEPLOYMENT DIAGRAMS**
Draw a Component diagram for a. Passport AutomationSystem b. Book bank managementsystem c. Online course reservationsystem	
Week-13	**DEPLOYMENT DIAGRAMS**
Draw a Component diagram for a. Passport AutomationSystem b. Book bank managementsystem c. Online course reservationsystem	

Text Books:
1. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Pearson Education, 2ndEdition,2004.
2. Enrich Gamma, Richard Helm, Ralph Johnson, John Vlissides, "Design Patterns", Pearson Education, 2ndEdition,2009.
3. Craig Larman, "Applying UML and Patterns", 3rdEdition,2011.
Reference Books:
1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis and Design Using UML", McGraw-Hill Education, 4thEdition,2010.
2. Pascal Roques, "Modeling Software Systems Using UML 2", WILEY- Dreamtech India Pvt. Ltd, 2ndEdition,2007.
Web References:
1. https://www.tutorialspoint.com/uml/uml_overview.html
2. https://www.utdallas.edu/~chung/OOAD/M03_1_StructuralDiagrams.ppt
3. https://onedrive.live.com/download?cid=99CBBF765926367
SOFTWARE AND HARDWARE REQUIREMENTS FOR A BATCH OF 60 STUDENTS: HARDWARE: Intel Desktop Systems: 60 no's   SOFTWARE: System software: Windows 7.   Application software: IBM Rational Rose 7.0.

XV. COURSEPLAN:

The course plan is meant as a guideline. Probably there may be changes.

Week No.	Topics to be covered	Course Learning Outcomes (CLOs)	Reference
1	Software Requirements Specification	CLO 1, CLO 2	T1:1.1
2	Use Case Diagram	CLO 1, CLO 2, CLO 3	T1:2.3
3	Activity Diagram	CLO 5, CLO 6	T1:4.1
4	Domain Model	CLO 6, CLO 7	T1:5.1
5	Scenarios	CLO 8, CLO 6,CLO 4	T1:6.1
6-7	State Chart Diagram	CLO 8, CLO 9	T1:7.1.1
8-9	Architecture Diagram	CLO 9, CLO 10	T1:12.5
10-11	Component Diagram	CLO 11, CLO 12	T1:15.1
12-13	Deployment Diagrams	CLO 11, CLO 13	T1:20.5

XVI. GAPS IN THE SYLLABUS - TO MEET INDUSTRY / PROFESSIONREQUIREMENTS:

S No	Description	Proposed actions	Relevance with POs	Relevance with PSOs
1	Real time Online Transform System	Videos	PO 3	PSO 1
2	Case study of next gen POS system and other applications	Case studies	PO 2	PSO 1

Prepared by:
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HOD, CSE