

# **INSTITUTE OF AERONAUTICAL ENGINEERING**

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

# **COURSE CONTENT**

# **OBJECT ORIENTED SOFTWARE ENGINEERING LABORATORY**

#### V Semester: CSE (AI & ML)

Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACSD28	Core	L	Т	Р	С	CIA	SEE	Total
		0	0	2	1	40	60	100
Contact Classes: NIL	Tutorial Classes: NIL	Practical Classes: 45			То	Total Classes: 45		
Prerequisite: No Prerequites required								

#### I. COURSE OVERVIEW:

This course introduces analyses, design of a system by applying the object-orientated concepts, and develops a set of graphical system models during the development life cycle of the software. This course includes techniques to produce detailed object models and designs from system requirements, use the modeling concepts provided by UML, identify use cases and expand into full behavioral designs, expand the analysis into a design ready for implementation and construct designs that are reliable, various testing scenarios for the given problem statements.

#### **II. COURSES OBJECTIVES:**

The students will try to learn:

- I. How to select suitable software development process model for the given scenario.
- II. How to classify the requirements and prepare software requirement documents for analyzing the projects.
- III. The different design techniques and their implementation to develop the software.

#### **III. COURSE OUTCOMES:**

- CO1 Summarize the features of software in view of Software development process
- CO2 Make Use of UML notations to represent requirement of the system
- CO3 Develop a design model of the software system with the help of UML structural diagrams.
- CO4 Design a behavioral model of the software system with the help of UML structural diagrams
- CO5 Develop a design model for different real time application.

#### **IV. COURSE SYLLABUS:**

#### Week - 1: REQUIREMENT DEVELOPMENT

Background: Requirement engineering produces a specification of what a system should do. The intention of requirement engineering is to provide a clear definition of requirement of the systems. This phase is a very important phase because, if the customer requirements are not clearly understood, the ambiguity can get into the other phase of the development. To avoid such issues, requirement must be elicited using the right elicitation techniques, to be analyzed effectively, specified clearly and verified thoroughly. All activities are collectively termed as requirement development activities.

Problem Description: Identify the requirement development activities associated with each of the following scenarios,

a. Joe is creating an online survey questionnaire to request user feedback on the desired features of the

application to be developed.

- b. Mark is preparing a formal document which includes all of the desired features identified by the survey.
- c. Jack identified an incomplete requirement statement
- d. Jones is identifying all security related requirements and separating them from the performance related requirements
- e. Merlin, a team member, is sent to client to observe the business case and collect typical user requirements
- f. Leo is team member, is working on requirement and ensuring that requirement collected should not be vague and unclear.
- g. Lee is conducting a facilitated meeting with the stakeholder to capture the requirements. Amit a team member is distributing questionnaires to stack holder for gathering user requirements.

Scenario	Requirement Development Activities
А	
В	
С	
D	
E	
F	
G	
Н	

## Week - 2: ANALYSIS OF SYSTEM USING UML NOTATIONS

1. Demonstrate the Classes, relationships, common mechanisms. Create SRS for Recruitment System.

#### Week-3: DESIGN OF SYSTEM USING STRUCTURAL DIAGRAMS

1. Design and illustrate the static part of the system using the UML structural diagrams (Object, and Class diagrams).

# Week-4: DESIGN OF SYSTEM USING STRUCTURAL DIAGRAMS

1. Design and illustrate the static part of the system using the UML behavioral diagrams (Use case, Sequential and Collaboration)

#### Week-5: DESIGN OF SYSTEM USING BEHAVIORAL DIAGRAMS

1. Design and illustrate the static part of the system using the UML behavioral diagrams (Use case, Sequential and Collaboration)

#### Week-6: DESIGN OF SYSTEM USING BEHAVIORAL DIAGRAMS

1. Design and illustrate the static part of the system using the UML behavioral diagrams (Activity and State chart)

# Week-7: EXAM REGISTRATION SYSTEM

1. Create a UML model for a system to perform the Exam Registration system Problem Description: Exam Registration system.is used in the effective dispatch of registration form to all of the students. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, reg.no etc.) filled by the student whose testament is verified for its genuineness by the Exam Registration System with respect to the already existing information in the database.

# Week-8: STOCK MAINTENANCE

1. Create a UML model for a system to perform the Stock maintenance Problem Description: The stock

maintenance system must take care of sales information of the company and must analyze the potential of the trade. It maintains the number of items that are added or removed. The salesperson initiates this Use case. The salesperson is allowed to update information and view the database

# Week-9: PASSPORT PROCESS

1. Create an UML model for an automated system to perform the Passport Process. Problem Description: Passport Automation System is used in the effective dispatch of passport to all of the applicants. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, address etc.,) filled by the applicant whose testament is verified for its genuineness by the Passport Automation System with respect to the already existing information in the database.

## Week-10: E- BOOK MANAGEMENT SYSTEM

 Create a UML model for a system to perform E- book Management Problem Description: An E- Book lends books and magazines to members, who is registered in the system. Also, it handles the purchase of new titles for Book Bank. Popular titles are brought into multiple copies. Old books and magazines are removed when they are out or date or poor in condition. A member can reserve a book or magazine that is not currently available in the book bank, so that when it is returned or purchased by the book bank, that person is notified. The book bank can easily create, replace and delete information about the tiles, members, loans and reservations from the system.

#### Week-11: RECRUITMENT PROCESS

 Create a UML model for an automated system to perform the Recruitment System Process. Problem Description: The recruitment system allows the job seekers to enroll their names through the process of registration. The employee also can get the list of available candidates and shortlist for their company requirement. Once the applicant enrolls, he receives an id, which helps him in further Correspondence. A fees amount is received from the job seekers for enrollment. This system makes the job seeker easier than waiting in queues for enrollment. This also reduces the time consumption for both the job seeker and employee.

#### Week-12: EXAM REGISTRATION SYSTEM

1. Create a UML model for a system to perform the Exam Registration system Problem Description: Exam Registration system.is used in the effective dispatch of registration form to all the students. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, reg.no etc.,) filled by the student whose testament is verified for its genuineness by the Exam Registration System with respect to the already existing information in the database.

# Week-13: CONFERENCE MANAGEMENT SYSTEM

- 1. Create a UML model for Conference management system. Problem Description: The process of the candidates is to login to the conference system and submit the paper online. Then the reviewer reviews the paper and sends the acknowledgement to the candidate whether selected or rejected. This process of on conference management system are described sequentially through following steps,
  - The candidate logs in to the conference management system.
  - The paper title is submitted.
  - The paper has been reviewed by the reviewer.
  - The reviewer sends acknowledgement to the candidate.
  - Based on the selection, the best candidate is selected.
  - Finally, the candidate registers all the details.

#### Week-14: PERFORMANCE TESTING

1. Background: Performance testing tests the non-functional requirements of the system. The different types of performance testing are loading testing, stress testing, endurance testing and spike testing. Problem Description: Identify the type of performance testing for the following:

- A space craft is expected to function for nearly 8 years in space. The orbit control system of the spacecraft is a real-time embedded system. Before the launch, the embedded software is to be tested to ensure that it can work for 8 years in space. Identify the suitable performance testing category to be carried out to ensure that the spacecraft will be functioning for 8 years in space as required.
- Global Education Centre (GEC) at Infosys Mysore provides training for fresh entrants. GEC uses an automated tool for conducting objective type tests for the trainees. At the time, a maximum of 2000 trainees are expected to take the test. Before the tool is deployed, testing of the tool was carried out to ensure that it is capable of supporting 2000 simultaneous users. Indicate the performance testing category?
- A university uses its web-based portal for publishing the results of the students. When the results of an examination were announced on the website recently on a pre-planned date, the web site crashed. Which type of performance testing should have been done during web-site development to avoid this unpleasant situation?
- During unexpected terrorist attack, one of the popular websites crashed as many people logged into the website in a short span of time to know the consequences of terrorist attack and for immediate guidelines from the security personnel. After analyzing the situation, the maintenance team of that website came to know that it was the consequences of unexpected load on the system which had never happened previously. Which type of performance testing should have been done during web-site development to avoid this unpleasant situation?

Scenarios	Performance Testing Type
Scenario 1	
Scenario 2	
Scenario 3	
Scenario 4	

#### **IV. REFERENCE BOOKS:**

- Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Pearson Education, 2<sup>nd</sup> Edition, 2004.
- Craig Larman, "Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Iterative Development", Pearson Education, 3<sup>rd</sup> Edition, 2005.

#### **V. 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
- 4. http://www.tutorialspoint.com