GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology					Branch/Spec.	Computer Science and Business Systems		
Semester	V					Version	1.0.0.0		
Effective from Academic Year	2023-24					Effective for the Batch admitted in			July 2021
Course Code	2CSBS5101	Course Name				Software Design with UML			
Teaching Scheme						Examination Scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2	0	1	-	3	Theory	40	60	100
Hours	2	0	2	-	4	Practical	30	20	50

Pre-requisites

Concept of object oriented programming.

Course Outcomes

On successful completion of the course, the students will be able to:

CO1	understand the importance of modelling in the software development life cycle.
CO2	apply Unified Modelling Language for creating software design models with object oriented approach.
CO3	differentiate and create static as well as dynamic models of any software problem to solve.
CO4	apply their knowledge of component modelling and deployment modelling for covering aspects (like database, network etc.) other than the basic software features in analysis and design.

Theory Syllabus

Unit	Content	Hrs.
1	**Introduction to on Object Oriented Technologies and the UML Method:** Software development process: The Waterfall Model vs. The Spiral Model; The Software Crisis, description of the real world using the Objects Model; Classes, inheritance and multiple configurations; Quality software characteristics; Description of the Object-Oriented Analysis process vs. the Structure Analysis Model.	04
2	**Introduction to the UML Language:** Standards; Elements of the language; General description of various models; The process of Object-Oriented software development; Description of Design Patterns; Technological Description of Distributed Systems.	04
3	**Requirements Analysis Using Case Modeling:** Analysis of system requirements; Actor definitions; Writing a case goal; Use Case Diagrams; Use Case Relationships.	03
4	**Transfer from Analysis to Design in the Characterization Stage: Interaction Diagrams:** Description of goal; Defining UML Method, Operation, Object Interface, Class; Sequence Diagram; Finding objects from Flow of Events; Describing the process of finding objects using a Sequence Diagram; Describing the process of finding objects using a Collaboration Diagram.	04
5	**The Logical View Design Stage: The Static Structure Diagrams:** The Class Diagram Model; Attributes descriptions; Operations descriptions; Connections descriptions in the Static Model; Association, Generalization, Aggregation, Dependency, Interfacing, Multiplicity.	03
6	**Package Diagram Model:** Description of the model, White box, black box; Connections between packagers; Interfaces; Create Package Diagram; Drill Down.	03
7	**Dynamic Model: State Diagram / Activity Diagram:** Description of the State Diagram; Events Handling; Description of the Activity Diagram; Exercise in State Machines.	03
8	**Component Diagram Model:** Physical Aspect; Logical Aspect; Connections and Dependencies; User face; Initial DB design in a UML environment.	03
9	**Deployment Model:** Processors; Connections; Components; Tasks; Threads; Signals and Events.	03

Practical Content

UML include the following 9 diagrams:

1. Class Diagram
2. Object Diagram

3. Use Case Diagram
4. Sequence Diagram
5. Collaboration Diagram
6. State Chart Diagram
7. Activity Diagram
8. Component Diagram
9. Deployment Diagram

For the following Applications:

- ATM Systems
- Stock Maintenance System
- Remote Procedure Call Implementation

Draw the UMLS diagrams.

Text Books	
1	The Unified Modelling Language User Guide by Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.
Reference Books	
1	Design Patterns: Elements of Reusable Object-Oriented Software by Erich Gamma, Richard Helm, Ralph Johnson, and John M. Vlissides.
ICT/MOOCs Reference	
1	https://nptel.ac.in/courses/106105153
2	https://nptel.ac.in/courses/106105224
3	https://nptel.ac.in/courses/106105153
4	https://www.edx.org/course/uml-class-diagrams-for-software-engineering-course-v1-kuleuvenx-umlx-3t2022
5	https://www.classcentral.com/course/software-engineering-modeling-software-systems-us-81469
6	https://www.udemy.com/course/djeyamala-ooad-uml/
7	https://www.udemy.com/course/oo-analysis-design-programming/
8	https://www.udemy.com/course/uml-the-complete-uml-unified-modeling-language-reference/
9	https://www.udemy.com/course/uml-fundamentals/
10	https://in.coursera.org/learn/software-engineering-modeling-software-systems-using-uml

Mapping of CO with PO and PSO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	0	1	0	3	3	3	1	3	2	0
CO2	3	3	3	2	2	0	1	0	2	3	3	1	2	3	0
CO3	3	2	3	3	2	0	1	0	2	2	3	1	3	3	0
CO4	2	2	3	2	2	0	0	0	1	2	2	0	1	2	0