



**K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BENGALURU - 560109**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CO-PO Mapping**

<b>Course: Object Oriented Modeling And Design</b>			
<b>Type: Elective</b>		<b>Course Code: 17CS551</b>	
<b>No of Hours</b>			
Theory (Lecture Class)	Practical/Field Work/Allied Activities	Total/Week	Total teaching hours
3	0	3	40
<b>Marks</b>			
Internal Assessment	Examination	Total	Credits
40	60	100	4

**Aim/Objectives of the Course**

1. Understand the concepts of object-oriented and basic class modeling.
2. Illustrate the use case modeling and its requirements.
3. Explain the system conception and domain analysis.
4. Discuss the object oriented design discipline.
5. Outline the design pattern for object oriented design modeling.

**Course Learning Outcomes**

After completing the course, the students will be able to

<b>CO1</b>	<b>Discuss</b> the concepts involved in Object-Oriented modeling and their benefits.	<b>Understanding (K2)</b>
<b>CO2</b>	<b>Explain</b> the concept of use-case model, sequence model and state chart model for a given problem.	<b>Understanding (K2)</b>
<b>CO3</b>	<b>Interpret</b> the facets of the unified process approach to design and build a Software system.	<b>Understanding (K2)</b>
<b>CO4</b>	<b>Summarize</b> the concepts of requirements into implementation for Object Oriented design.	<b>Understanding (K2)</b>
<b>CO5</b>	<b>Outline</b> an appropriate design pattern to facilitate development procedure .	<b>Understanding (K2)</b>

**Syllabus Content**

<p><b>Module 1:</b> Introduction, Modeling Concepts and Class Modeling: What is Object orientation? What is OO development? OO Themes; Evidence for usefulness of OO development; OO modeling history. Modeling as Design technique: Modeling; abstraction; The Three models. Class Modeling: Object and Class Concept; Link and associations concepts; Generalization and Inheritance; A sample class model; Navigation of class models; Advanced Class Modeling, Advanced object and class concepts; Association ends; N-ary associations; Aggregation; Abstract classes; Multiple inheritance; Metadata; Reification; Constraints; Derived Data; Package</p> <p><b>LO:</b> At the end of this session the student will be able to</p> <ol style="list-style-type: none"> <li>1. Outline the uses of system sequence diagram.</li> <li>2. Explain the software development stages in detail.</li> </ol>	<p><b>CO1</b></p> <p>8 hrs</p> <p>PO1-3 PO5-1 PO6-1 PO7-1 PO10-1 PO12-1 PSO1-3 PSO2-1</p>
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3. Define SSD. Summarize the steps to develop SSD based activity diagram.	
<p><b>Module 2:</b> UseCase Modeling and Detailed Requirements: Overview; Detailed object oriented Requirements definitions; System Processes-A use case/Scenario view; Identifying Input and outputs-The System sequence diagram; Identifying Object Behavior-The state chart Diagram; Integrated Object-oriented Models.</p> <p><b>LO:</b> At the end of this session the student will be able to</p> <ol style="list-style-type: none"> <li>1. Write a note on waterfall development life cycle and iterative development life cycle.</li> <li>2. Explain an overview of domain analysis.</li> <li>3. Draw the initial class diagram of ATM system.</li> </ol>	<p><b>CO2</b></p> <p>8hrs.</p> <p>PO1-3 PO5-1 PO6-1 PO7-1 PO10-1 PO12-1 PSO1-3 PSO2-1</p>
<p><b>Module 3:</b> Process Overview, System Conception and Domain Analysis: Process Overview: Development stages; Development life Cycle; System Conception: Devising a system concept; elaborating a concept; preparing a problem statement. Domain Analysis: Overview of analysis; Domain Class model: Domain state model; Domain interaction model; Iterating the analysis.</p> <p><b>LO:</b> At the end of this session the student will be able to</p> <ol style="list-style-type: none"> <li>1. Explain the software development stages in detail.</li> <li>2. Write a note on waterfall development life cycle .</li> <li>3. Discuss different way of finding new system concepts.</li> <li>4. Explain an overview of domain analysis.</li> </ol>	<p><b>CO3</b></p> <p>8 hrs</p> <p>PO1-3 PO5-1 PO6-1 PO7-1 PO10-1 PO12-1 PSO1-3 PSO2-1</p>
<p><b>Module4:</b> Use case Realization :The Design Discipline within up iterations: Object Oriented Design-The Bridge between Requirements and Implementation; Design Classes and Design within Class Diagrams; Interaction Diagrams-Realizing Use Case and defining methods; Designing with Communication Diagrams; Updating the Design Class Diagram; Package Diagrams-Structuring the Major Components; Implementation Issues for Three-Layer Design.</p> <p><b>LO:</b> At the end of this session the student will be able to</p> <ol style="list-style-type: none"> <li>1. Explain the process of Design with communication Diagrams.</li> <li>2. Outline the standard stereotypes found in design model with figure.</li> <li>3. Summarize the overview of object oriented programs with neat diagram.</li> </ol>	<p><b>CO4</b></p> <p>8 hrs</p> <p>PO1-3 PO5-1 PO6-1 PO7-1 PO10-1 PO12-1 PSO1-3 PSO2-1</p>
<p><b>Module 5:</b> Design Patterns: Introduction; what is a design pattern?, Describing design patterns, the catalogue of design patterns, Organizing the catalogue, How design patterns solve design problems, how to select a design patterns, how to use a design pattern; Creational patterns: prototype and singleton (only); structural patterns adaptor and proxy (only).</p> <p><b>LO:</b> At the end of this session the student will be able to</p> <ol style="list-style-type: none"> <li>1. Define Design pattern. Explain how to describe design pattern.</li> </ol>	<p><b>CO5</b></p> <p>8 hrs</p> <p>PO1-3 PO5-1 PO6-1 PO7-1</p>

<ol style="list-style-type: none"> <li>2. Summarize the applicability, benefits and liabilities of abstract factory pattern.</li> <li>3. List any five design problems. Explain how design pattern solves the design problems.</li> </ol>	PO10-1 PO12-1 PSO1-3 PSO2-1
<b>Text Books</b> <ol style="list-style-type: none"> <li>1. Michael Blaha, James Rumbaugh: Object Oriented Modelling and Design with UML, 2nd Edition, Pearson Education, 2005</li> <li>2. Satzinger, Jackson and Burd: Object-Oriented Analysis &amp; Design with the Unified Process Cengage Learning, 2005.</li> <li>3. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides: Design Patterns – Elements of Reusable Object-Oriented Software, Pearson Education, 2007.</li> </ol>	
<b>Reference Books</b> <ol style="list-style-type: none"> <li>1. Grady Booch et. al.: Object-Oriented Analysis and Design with Applications, 3rd Edition, Pearson Education, 2007.</li> <li>2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michel Stal: Pattern – Oriented Software Architecture. A system of patterns, Volume 1, John Wiley and Sons, 2007.</li> <li>3. Booch, Jacobson, Rumbaugh : Object-Oriented Analysis and Design with Applications, 3rd edition, Pearson, Reprint 2013</li> </ol>	
<b>Useful Websites</b> <ol style="list-style-type: none"> <li>1. <a href="https://levelup.gitconnected.com">https://levelup.gitconnected.com</a></li> <li>2. <a href="http://nptel.ac.in/courses/106105153">http://nptel.ac.in/courses/106105153</a></li> <li>3. <a href="https://www.digimat.in/nptel/courses">https://www.digimat.in/nptel/courses</a></li> </ol>	
<b>Useful Journals</b> <ol style="list-style-type: none"> <li>1. <a href="https://ieeexplore.ieee.org/document/7474471">https://ieeexplore.ieee.org/document/7474471</a></li> </ol>	
<b>Teaching and Learning Methods</b> <ol style="list-style-type: none"> <li>1. Lecture class : 40 hrs</li> </ol>	
<b>Assessment</b> <b>Type of test/examination:</b> Written examination <b>Continuous Internal Evaluation (CIE) :</b> 40 marks (Average of three tests will be considered for 30 marks+ Assignment 10 Marks) . All the three Assignments will be written type. <b>Semester End Exam (SEE) :</b> 100 marks (students have to answer all main questions) which will be reduced to 60 Marks. <b>Test duration:</b> 1 :30 hrs <b>Examination duration:</b> 3 hrs	


## CO to PO Mapping

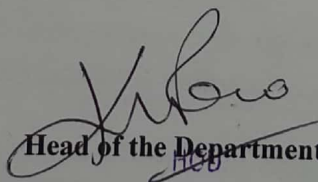
<p><b>PO1:</b> Science and engineering Knowledge</p> <p><b>PO2:</b> Problem Analysis</p> <p><b>PO3:</b> Design &amp; Development</p> <p><b>PO4:</b> Investigations of Complex Problems</p> <p><b>PO5:</b> Modern Tool Usage</p> <p><b>PO6:</b> Engineer &amp; Society</p>	<p><b>PO7:</b> Environment and Society</p> <p><b>PO8:</b> Ethics</p> <p><b>PO9:</b> Individual &amp; Team Work</p> <p><b>PO10:</b> Communication</p> <p><b>PO11:</b> Project Management &amp; Finance</p> <p><b>PO12:</b> Life long Learning</p>
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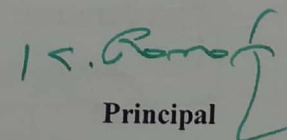
**PSO1:** Understand fundamental and advanced concepts in the core areas of Computer Science and Engineering to analyze, design and implement the solutions for the real world problems.

**PSO2:** Utilize modern technological innovations efficiently in various applications to work towards betterment of society and solve engineering problems.

CO	PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
17CS551	K-level														
CO1	K2	3	-	-	-	1	1	1	-	-	1	-	1	3	1
CO2	K3	3	-	-	-	1	1	1	-	-	1	-	1	3	1
CO3	K3	3	-	-	-	1	1	1	-	-	1	-	1	3	1
CO4	K3	3	-	-	-	1	1	1	-	-	1	-	1	3	1
CO5	K3	3	-	-	-	1	1	1	-	-	1	-	1	3	1

  
Course In charge

  
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