

St. Xavier's College (Autonomous), Ahmedabad

**Syllabus of Semester – IV of the following departments under
Faculty of Computer Science based on Undergraduate Curriculum
Framework to be implemented from the Academic Year 2024-25.**

DEPARTMENT OF COMPUTER SCIENCE

BCA(Hons.) Category-IV

Major Course – 1: Object Oriented Analysis and Design

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Pre-requisite(s) of the Course (if any)
	Lecture	Tutorial	Practical / Practice		
Object Oriented Analysis and Design BCAMN441C	4	0	0	Students with basic coding knowledge	Nil

Course Objective:

The objective of the course is to make student aware about fundamentals of software development life cycle and needs of different diagrams during development process at different levels. It covers various feasibility studies and all UML diagrams so students can analyze the requirements of the user and can develop the system. This course helps students to know about the significance and importance of every stage of software development in industry.

Course Outcome:

At the end of the course, a student will be able to:

- Understand how a software development process takes place in the IT industry and which models they use.
- What are the different stages of software development process like 'user requirement, collecting data, analysis of data, system design, system testing' and 'implementation' and also learn their importance.
- Learn different methods to collect data for the system.
- Draw data flow diagram where they can show how data flows in the system from one module to another.
- Design data dictionary
- Identify main entities of a software and how entities interact with the processes and how processes interact with the database.
- Analyze system requirement specifications and after that prepare a design of the system.
- Study various feasibility study and decide that the project is feasible or not. COBC4504.09: Understand the concept of Object oriented modeling and approach along with the Pillars of OOAD
- Use of various UML and draw a specific UML for one particular stage of software development process.

Unit	Unit Details	Hours
	System Analysis and Design – Introduction - Software Development Models - Waterfall Model - The Incremental Model - The Spiral Model	
	System Analysis & Design (SAD) - Introduction - Overview Feasibility Study - Operational Feasibility - Technical Feasibility - Economic Feasibility - Schedule Feasibility	
I	Requirement Modeling / Fact-finding techniques - Interview - Document review - Observation - Questionnaires and surveys - Data and Process Modeling - Data Flow Diagram: Concepts – Symbols - Rules - Construction of DFD for any Case Study	10
	Data Dictionary – Concepts – Rules - Construction of Data Dictionary for any Case Study.	
II	Object Oriented Analysis & Design – Introduction Object-Oriented Modeling - Analysis Model - Architecture Model - Component Design Model Object-Oriented Approach - Object Orientation - Object-Oriented Analysis - Object-Oriented Design The Constituents of OOAD - Objects and Classes - Links and Association - Generalization and Specialization - Aggregation and Composition	10

Pillars of Object-Oriented Analysis and Design - Abstraction - Encapsulation
- Inheritance - Polymorphism - Coupling - Cohesion - Components - Interfaces

The Language of OOAD – Unified Modelling Language - UML Diagrams

III **Use Case Diagram, Class Diagram and Object Diagram** 10

Use-Case Diagram - Introduction - Scope of Use-Case Diagram - Benefits of Use-Case Diagram - Elements of Use-Case Diagram - Actors - Use-Cases - Relationship between Actor and Use Case - Relationship between Use-Cases - Relationship between Actors - Guidelines for design of Use-Case Diagram - Draw the Use-Case diagram for any Case study

Class Diagram - Analysis and Design version of Class Diagram - Elements of Class Diagram - Guidelines for design of Class Diagram

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Object Diagram - Introduction - Elements of Object Diagram: Objects Links - Guidelines for design of Object Diagram - Draw the Class and Object Diagram for any Case Study

IV **Sequence Diagram, Collaboration Diagram, Activity Diagram & State Chart Diagram.** 10

Sequence Diagram - Introduction - Elements of Sequence Diagram - Life Lines

- Messages - Activation - Guards - Combined Fragments - Objects - Guidelines for design of Sequence Diagram - Draw the Sequence Diagram for any case study

Collaboration Diagram - Introduction - Elements of Collaboration Diagram - Links - Messages - Objects - Guidelines for design of Sequence Diagram - Draw the Sequence Diagram for any case study

Activity Diagram - Introduction - Elements of Activity Diagram - Initial State

- Final State - Action / Activity - Transitions - Decision - Synchronization, Fork and Join - Swimlanes - Object and Object Flow - Guidelines for design of Activity Diagram - Draw the Activity Diagram for any case study

State Chart Diagram - Introduction - Elements of State Chart Diagram - Initial

State - Final State - State - Transitions - Guidelines for design of State Chart Diagram - Draw the State Chart Diagram for any case study

Text Book:

- 1) Magnifying Object-Oriented Analysis and Design Publisher: PHI Author: Arpita Gopal and Netra Patil System Analysis and Design Methods Publisher: Cengage Learning By: Gary B. Shelly, Thomas J. Cashman, Harry J. Rosenblatt

Note: Only Unit-1 will be covered from Text Book-2.

Reference Books:

- 1) System Analysis and Design with UML version 2.0 an Object-Oriented Approach Publisher: Wiley By: Alan Dennis, Barbara Haley Wixom, David Tegarden Object-Oriented Analysis & Design with Unified Process Publisher: Cengage Learning By: Satzinger, Jackson, Burd