GLS UNIVERSITY
Bachelor of Computer Applications (BCA)
(Core Course)
Semester-IV
0301403 STRUCTURED & OBJECT-ORIENTED ANALYSIS & DESIGN

1. Course Objective:

- To understand the concepts, role and importance of the Structured Approach and Object-Oriented approach for System Development in real life applications.
- To recognize the different phases of System Development Life Cycle for real-life applications.
- To identify the key points to take into account while using Structured and Object-Oriented approach for System Development.
- To comprehend the type of Structured and Object-Oriented model to apply according to the scenery of applications.
- To be aware of the real stages and phases for System Development.

2. Course Duration:

The course will have sessions which are divided into five modules. Each module consists of nine sessions of 60 minutes each and carries a weightage of 20%.

3. Course Contents:

Module No.	Modules/Sub-Modules	No. of Sessions	Weightage

I	**The System Analyst and Information System Development**
	• **Introduction**
	• **The System Analyst**
	  o System Analyst Skills
	  o System Analyst Roles
	• **The System Development Life Cycle & Deliverables**
	  o Planning
	  o Analysis
	  o Design
	  o Implementation
	• **Feasibility Analysis**
	  o Technical Feasibility
	  o Economic Feasibility
	  o Organizational Feasibility
	• **Introduction to Requirements Determination**
	• **Requirement elicitation Techniques**
	  o Interviews
	  o Joint Application Development
	  o Questionnaires
	  o Document Analysis
	  o Observation
		09	20%

II	**Process Modelling**
	• **Introduction**
	• **Data Flow Diagrams**
	  o Reading Data Flow Diagrams
	  o Elements of Data Flow Diagrams
	  o Defining Business Process
	  o Process Description
	• **Creating Data Flow Diagrams**
	  o Context Diagram
	  o Data Flow Diagrams Fragments
	  o Level 0 Diagram
	  o Level 1 Diagram
	  o Validating the Data Flow Diagrams
	  o Case study of DFDs
	  o Draw Case study with Draw.io
	• **Data Dictionary**
	• **Case study of data dictionary**
		09	20%

III	**Object Oriented Analysis & Design**
	• **Introduction**
	• **Object-Oriented Modelling**
	  o Analysis Model
	  o Architecture Model
	  o Component Design Model
	• **Object-Oriented Approach**
	  o Object Orientation
	  o Object-Oriented Analysis
	  o Object-Oriented Design
	• **The Constituents of OOAD**
	  o Objects and Classes
	  o Links and Association
	  o Generalization and Specialization
	  o Aggregation and Composition
	• **Pillars of Object-Oriented Analysis and Design**
	  o Abstraction
	  o Encapsulation
	  o Inheritance
	  o Polymorphism
	  o Coupling
	  o Cohesion
	  o Components
	  o Interfaces
	• **The Language of OOAD – Unified Modelling Language**
	  o UML Diagrams
		09	20%

IV	**Use Case Diagram, Class Diagram and Object Diagram**
	• **Use-Case Diagram**
	  o Introduction
	  o Scope of Use-Case Diagram
	  o Benefits of Use-Case Diagram
		09	20%

	○ 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 in draw.io • **Class Diagram** ○ Analysis and Design version of Class Diagram ○ Elements of Class Diagram ○ Guidelines for design of Class Diagram • **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 in draw.io		
V	**Sequence Diagram, Collaboration Diagram, Activity Diagram & State Chart Diagram.** • **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 in draw.io • **Collaboration Diagram** ○ Introduction ○ Elements of Collaboration Diagram ▪ Links ▪ Messages ▪ Objects ○ Guidelines for design of Sequence Diagram ○ Draw the Sequence Diagram for any case study in draw.io • **Activity Diagram** ○ Introduction ○ Elements of Activity Diagram ▪ Initial State ▪ Final State	09	20%

	▪ Action / Activity ▪ Transitions ▪ Decision ▪ Synchronization, Fork and Join ▪ Swimlanes ▪ Object and Object Flow o Guidelines for design of Activity Diagram o Draw the Activity Diagram for any case study • **State Chart Diagram** o Introduction o Elements of State Chart Diagram ▪ Initial State ▪ Final State ▪ State ▪ Transitions o Guidelines for design of State Chart Diagram o Draw the State Chart Diagram for any case study in draw.io		

4. Teaching Methods:

The following pedagogical tools will be used to teach this course:

1. Lectures and Discussions
2. E-learning
3. Assignments and Presentations

5. Evaluation:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

1.	Assignments / Presentations/ Quizzes	30% (Internal Assessment)
2.	Internal Examination	20%(Internal Assessment)
3.	External Examination	50% (External Assessment)

Note: Student should submit minor Website Development Project as a part of assignment.

6. Basic Text Books:

Sr. No	Author/s	Name of the book	Publisher	Edition
T1	Arpita Gopal, Netra Patil	Magnifying Object-Oriented Analysis and Design	PHI	2011
T2	Alan Dennis, Wixom and Roth	System Analysis and Design	Wiley	Fifth Edition

7. Reference Books:

Sr. No	Author/s	Name of the book	Publisher	Edition
R1	Bradley Milllspaugh	System Analysis and Design Methods Publisher: Cengage Learning By: Gary B. Shelly, Thomas J. Cashman, Harry J. Rosenblatt	TATA McGraw HILL	-
R2	Satzinger, Jackson, Burd	Object-Oriented Analysis & Design with Unified Process Publisher: Cengage Learning	Wrox Press	-
R3	Murach	System Analysis and Design with UML version 2.0 an Object-Oriented Approach Publisher: Wiley By: Alan Dennis, Barbara Haley Wixom, David Tegarden	BPB publications	2008

8. List of Journals / Periodicals / Magazines / Newspapers etc.:

Sr. No	Link
1	http://nptel.ac.in/courses/122105022/27
2	http://nptel.ac.in/courses/122105022/28
3	http://nptel.ac.in/courses/122105022/29
4	http://www.saigontech.edu.vn/faculty/huynq/SAD/Systems_Analysis_Design_UML_5th%20ed.pdf
5	http://www.cengagebrain.com/content/shelly81617_0538481617_01.01_toc.pdf
6	http://web.cs.sunyit.edu/~zaydons/classwork/is320/textbook.pdf
7	http://www.tutorialspoint.com/object_oriented_analysis_design/ooad_tutorial.pdf
8	For making diagrams use: https://app.diagrams.net/ [check draw.io]

9. Session Plan:

Session No.	Topics/Chapters
1	Introduction
2-3	The System Analyst, The System Development Life Cycle
4-5	Project Identification and Initiation Feasibility Analysis
6	Introduction to Requirements Determination
7-9	Analysis Phase, Requirements Determination and Requirement elicitation Techniques
10	Introduction
11-14	Data Flow Diagrams
15-18	Creating Data Flow Diagrams
19	Introduction
20-21	Object-Oriented Modelling,
22	Object-Oriented Approach
23	The Constituents of OOAD,

24-27	Pillars of Object-Oriented Analysis and Design The Language of OOAD – Unified Modelling Language:
28-30	Use-Case Diagram
31-33	Class Diagram
34-36	Object Diagram
37-39	Sequence Diagram:
40-41	Collaboration Diagram:
42-43	Activity Diagram:
44-45	State Chart Diagram:

10. Learning Outcome:

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

- Understand real stages and phases for System Development.
- Draw various diagrams for System Development
- Gain knowledge and understanding of concepts, role and importance of the structured Approach and Object-Oriented approach for System Development in real life applications.
- Gain concepts of OO analysis and design skills
- Draw UML design diagrams.
- Design and implement project using OO concept