

COURSE TITLE	SYSTEM ANALYSIS AND DESIGN
COURSE CODE	05CA0405
COURSE CREDITS	4

Objective:

- 1 Understand the complete lifecycle of application development, including key phases such as planning, designing, coding, testing, and maintenance
- 2 Recognize the significance of proper documentation in software development for effective communication, project tracking, and future reference

Course Outcomes: After completion of this course, student will be able to:

- 1 Recall and explain the fundamental concepts of the Software Development Life Cycle (SDLC) and its importance in software engineering
- 2 Construct and interpret data modeling diagrams such as Data Flow Diagrams (DFDs) and Entity-Relationship (ER) diagrams for real-world system scenarios
- 3 Design and develop UML diagrams including Use Case, Class, Sequence, and Activity diagrams to represent software system functionality and structure

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction to Systems and SAD Types of Systems (Manual vs Automated, Open vs Closed) , System Analyst Role and Responsibilities, Overview of SAD and SDLC Phases, Introduction to Agile and Waterfall models, Preliminary Investigation, Feasibility Study (Technical, Economic, Operational) , Cost-Benefit Analysis	10
2	Requirements Gathering and Analysis Techniques: Interviews, Questionnaires, Observation, Document Analysis, Functional vs Non-Functional Requirements, Data Flow Diagrams (DFDs), Use Case Modeling, Data Dictionary	10
3	System Design Logical Design vs Physical Design, Input & Output Design, User Interface Design Principles, Database Design (ER Diagrams, Normalization), Security & Control Design	12

Contents : Unit	Topics	Contact Hours
4	Object-Oriented Analysis and Design Introduction to UML, Classes and Relationships, Class Diagrams, Use Case Diagrams, Activity Diagrams, Human-Computer Interaction, UX Design, Designing Effective Output, Designing Effective Input, Project Work.	13
Total Hours		45

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Unit 1 Explain each phase of the Software Development Life Cycle (SDLC) using an example project, Create a Software Requirements Specification (SRS) document for a simple project (e.g., a Library Management System), Identify functional and non-functional requirements for a given system, Discuss the importance of SDLC in real-world software projects, Analyze a case study and identify which SDLC phase the project is in	15
2	Unit 2 Compare and contrast Waterfall, Agile, and Spiral SDLC models, Identify a real-world application for each SDLC model and justify its selection, Explain how the RAD Model speeds up development compared to other models, Implement a small prototype using the Prototype Model for a login system, Discuss the advantages and disadvantages of the Big-Bang Model with examples	15
3	Unit 3 Create a Data Flow Diagram (DFD) for a Student Management System, Develop an Entity Relationship Diagram (ERD) for an E-commerce website, Use Data Dictionaries to define attributes for a database schema, Write process specifications for a simple online ticket booking system, Analyze a system's functional components using structured decision-making techniques	15
4	Unit 4 Draw a Class Diagram for an Online Banking System, Create a Use Case Diagram for a Food Delivery App, Develop an Activity Diagram for the order checkout process in an E-commerce website, Implement basic UX design principles to create a mockup of a login page, Present a mini-project that includes UML diagrams and a simple working prototype	15
Total Hours		60

Textbook :

- 1 Systems Analysis and Design, Kenneth E. Kendall, Julie E. Kendall, Pearson Education, 2013
- 2 Systems Analysis and Design Methods, Jeffrey L. Whitten, Lonnie D. Bentley, McGraw-Hill Education, 2007

References:

- 1 Modern Systems Analysis and Design, Modern Systems Analysis and Design, Jeffrey A. Hoffer, Joey George, Joseph S. Valacich, Pearson Education, 2016
- 2 Analysis and Design of Information Systems, Analysis and Design of Information Systems, James A. Senn, McGraw-Hill Education, 2003

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

- 1 Board Work
- 2 PPT
- 3 Demo

Supplementary Resources:

- 1 https://www.tutorialspoint.com/system_analysis_and_design/index.htm
- 2 <https://www.geeksforgeeks.org/system-analysis-and-design-tutorials/>
- 3 https://www.w3computing.com/systemsanalysis/?utm_source=chatgpt.com
- 4 <https://systemdesignschool.io/>
- 5 <https://www.coursera.org/learn/it-systems-design-and-analysis>