



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

SOFTWARE ENGINEERING AND COMPUTER NETWORKS LABORATORY								
IV Semester: CSE IT CSE(AI&ML) CSE(DS)								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AITE07	Core	0	0	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 36			
Prerequisites: There are no prerequisites to take this course.								

I. COURSE OVERVIEW:

This laboratory course provides hands-on experience in applying software engineering principles and computer networking concepts. Students perform experiments related to software development life cycle activities such as requirements analysis, design, implementation, testing, and project management. The course also introduces practical networking concepts including network configuration, protocols, socket programming, and performance analysis. Through practical exercises and mini-projects, students gain skills to design, develop, test, and analyze software systems and networked applications effectively.

II. COURSE OBJECTIVES:

The students will try to learn:

- I. Software engineering principles in the design, development, and testing of software applications.
- II. Computer networking concepts, protocols, and client-server communication.
- III. The skills required to problem-solving, teamwork, and technical documentation through laboratory experiments.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

- CO1: Apply software engineering principles to analyze requirements and develop software solutions.
CO2: Design and implement software applications following standard coding and documentation practices.
CO3: Perform software testing and debugging to ensure functionality and quality.
CO4: Implement and analyze computer network protocols and client-server applications.
CO5: Evaluate network and software performance using appropriate tools and metrics.
CO6: Work effectively in teams and communicate technical solutions through proper reports and presentations.

IV. COURSES CONTENT:

EXERCISE –1: CREATION OF TABLES

- a. Installation
- b. Software Requirement Specification
- c. Software Requirement Specification Document for e-Health billing software
- d. Software Requirement Specification Document for electronic shopping System

EXERCISE – 2: QUERIES USING DDL AND DML

- a. Object diagram for a Company's structure
- b. Object diagram for a course department
- c. Class Diagram for Intelligent Information Service System of Smart Library
- d. Class Diagram for On line Purchase System

EXERCISE – 3: QUERIES USING AGGREGATE FUNCTIONS

- a. Component diagram for Passport Issuance Automation
- b. Component diagram for Smart bank services
- c. Deployment diagram for Mobile Banking Android Services
- d. Deployment diagram for Gaming and Entertainment System

EXERCISE – 4: PROGRAMS ON PL/SQL

- a. Use case diagram for Airport check-in and security screening business model
- b. Use case diagram for Credit Card Processing System
- c. Use case diagram for Software Protection and Licensing
- d. Use case diagram for Transportation and Logistics

EXERCISE – 5: PROCEDURES AND FUNCTIONS

- a. Sequence diagram for Traffic Monitoring System
- b. Sequence diagram for IoT platform in a smart home company
- c. Collaboration diagram for Stock Maintenance
- d. Collaboration Diagram for Music Streaming Service

EXERCISE – 6: TRIGGERS

- a. Activity Diagram for Garage Parking Solution
- b. Activity diagram for a chatbot system design
- c. Activity diagram for Document Automation Process
- d. Activity diagram for to resolve an issue in a software design

EXERCISE – 7: PROCEDURES

- a. State chart diagram for Augmented Reality (AR) Game
- b. State Chart diagram for Educational Learning Management System
- c. State chart diagram for an AI-based image recognition system
- d. State Chart diagram for Stock Trading Platform

EXERCISE – 8: PROCEDURES

- A. BIT STUFFING IN COMPUTER NETWORK
- b. Bit Stuffing in python

EXERCISE – 9: CURSORS

- a. Character stuffing in computer Network
- b. Character stuffing in Python

EXERCISE – 10: CURSORS

- a. Character Count
- b. Basic Character Count
- c. Case-Insensitive Character Count

EXERCISE – 11: CASE STUDY: BOOK PUBLISHING COMPANY

- a. Cyclic Redundancy Check
- b. CRC at server side
- c. CRC at client side

EXERCISE – 12: CASE STUDY GENERAL HOSPITAL

- a. Shortest path in graph
- b. Shortest path by Dijkstra's algorithm
- c. Basic Floyd-Warshall Implementation

EXERCISE – 13: CASE STUDY: CAR RENTAL COMPANY

- a. Distance Vector Routing (DVR) Protocol
- b. Distance Vector Algorithm
- c. Subnet Calculator

EXERCISE – 14: CASE STUDY: STUDENT PROGRESS MONITORING SYSTEM

- a. Basic UDP Echo Server
- b. Basic UDP Echo Client
- c. Implementing a Simple File Transfer
- d. Simple TCP Server
- e. Simple TCP Client

V.TEXTBOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition.
2. The unified modeling language user guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.
3. Andrew S. Tanenbaum, David.j.Wetherall, "Computer Networks", Prentice-Hall, 5th Edition, 2010.

VI.REFERENCE BOOKS:

1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill.
3. Douglas E. Comer, "Internetworking with TCP/IP", Prentice-Hall, 5th Edition, 2011.
4. Peterson, Davie, Elsevier, "Computer Networks", 5th Edition, 2011.

VII.ELECTRONICS RESOURCES

1. [https://staruml.sourceforge.net/docs/user-guide\(en\)/ch04.html](https://staruml.sourceforge.net/docs/user-guide(en)/ch04.html)
2. https://www.tutorialspoint.com/uml/uml_standard_diagrams.html
3. <https://www.uml-diagrams.org/>
4. <https://www.geeksforgeeks.org/unified-modeling-language-uml-introduction/>
5. <https://www.geeksforgeeks.org/computer-network-tutorials/>

VIII. MATERIALS ONLINE

1. Course outline Description
2. Lab Manual
3. Lab Exercises