

**ANNAMACHARYA UNIVERSITY**  
**Department of Artificial Intelligence and Machine Learning**

**Semester V (Third year)**

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	PC	24ACSE52T	Computer Networks	3	0	0	3
2	PC	24ACSM51T	Machine Learning	3	0	0	3
3	PC	24AAIM51T	Data Wrangling and Exploratory Data Analysis	3	0	0	3
4	PE	24ACSE5DT	Quantum Computing	3	0	0	3
		24ACSE5AT	Software Testing Methodologies				
		24AAIM5AT	AI Chatbots				
		24ACSE5BT	Object Oriented Analysis and Design				
5	OE	24AAIM5BT	MOOC	3	0	0	3
6	PC	24ACSE52L	Computer Networks Lab	0	0	3	1.5
7	PC	24ACSM51L	Machine Learning Lab	0	0	3	1.5
8	PC	24AAIM51L	Data Wrangling and Exploratory Data Analysis Lab	0	0	3	1.5
9	MC	24AUD51T	Gender Sensitization	2	0	0	0
10	Internship	24AAIM51I	Summer Internship 2 Months after second year (to be evaluated during V semester)	0	0	0	2
Total Credits							21.5

Category	Credits
Professional Core Courses	13.5
Professional Elective courses	3
Open Elective Courses	3
Industrial/Research Internship	2
Total Credits	21.5

**Semester VI (Third year)**

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	PC	24ACSM62T	Natural Language Processing	3	0	0	3
2	PC	24ACAI62T	AI for Cloud Computing	3	0	0	3
3	PC	24ACSM61T	Data Visualization	3	0	0	3
4	PE	24ACSM6AT	Internet of Things	3	0	0	3
		24ACSE6AT	Software Project Management				
		24ACSM6BT	Cryptography and Network Security				
		24AAID61T	Big Data Analytics				
5	OE	24AAIM6BT	MOOC	3	0	0	3
6	PC	24ACSM62L	Natural Language Processing Lab	0	0	3	1.5
7	PC	24ACAI62L	AI for Cloud Computing Lab	0	0	3	1.5
8	PC	24ACSM61L	Data Visualization Lab	0	0	3	1.5
9	SEC	24AENG61S	Soft Skills	1	0	2	2
10	MC	24AMBA61T	Technical Paper Writing and Intellectual Property Right	2	0	0	0
<b>Total Credits</b>							<b>21.5</b>

<b>Category</b>	<b>Credits</b>
Professional Core courses	13.5
Professional Elective courses	3
Open Elective Course/Job oriented elective	3
Skill Enhanced Courses	2
<b>Total Credits</b>	<b>21.5</b>



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

<b>Title of the Course:</b>	<b>Computer Networks</b>
<b>Category:</b>	PC
<b>Year:</b>	III
<b>Semester:</b>	I
<b>Course Code:</b>	24ACSE52T
<b>Branch/es:</b>	CSE, AI&ML, CSE(AI), CSE(AIML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	52

**Course Objectives:** This course is designed to

1. Understand the protocol layering and physical level communication.
2. Analyze the performance of a network.
3. Describe the functions of network layer and the various routing protocols.
4. Familiarize the functions and protocols of the Transport layer.
5. Understand the working of various Application Layer Protocols.

**Course Outcomes:**

After completion of the course, students will be able to

1. Explain protocol layering, OSI/TCP-IP models, and physical layer communication.
2. Analyze network performance using metrics like throughput and delay.
3. Apply network layer functions and routing protocols.
4. Explain transport layer functions and differentiate TCP and UDP.
5. Illustrate the working of application layer protocols such as DNS and HTTP.

## **Unit 1 Introduction to Physical Layer 10**

Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet. Physical Layer: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wireless transmission.

## **Unit 2 Data Link Layer 12**

Data link layer: Design issues, framing, Error detection and correction. Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel. Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols. Medium Access sub layer: The channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols, collision free protocols.

## **Unit 3 The Network Layer 10**

Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Quality of Service, Internetworking, The Network layer in the internet.

## **Unit 4 The Transport Layer 10**

Transport Services, Elements of Transport protocols, Connection management, TCP and UDP protocols: RTP, RTTP.

**Textbook:**

1. Andrew S.Tanenbaum, David j.wetherall, Computer Networks, 7th Edition, PEARSON.

**Reference Books:**

1. James F. Kurose, Keith W. Ross, —Computer Networking: A Top-Down Approach||, 6th edition, Pearson, 2019.
2. Forouzan, Datacommunications and Networking, 5th Edition, McGraw Hill Publication.
3. Youlu Zheng, Shakil Akthar, —Networks for Computer Scientists and Engineers||, Oxford Publishers, 2016.

**Online Learning Resources:**

1. <https://nptel.ac.in/courses/106105183/25>
2. <http://www.nptelvideos.in/2012/11/computer-networks.html>
3. <https://nptel.ac.in/courses/106105183/3>

**CO-PO MAPPING:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSE52T.1	3	2	1	1	2	-	-	-	1	-	2	3	-	2
24ACSE52T.2	3	3	1	2	2	-	-	-	1	-	2	3	-	1
24ACSE52T.3	3	2	2	2	2	1	-	-	1	-	2	3	-	1
24ACSE52T.4	3	2	2	1	2	-	-	-	1	-	2	3	-	1
24ACSE52T.5	3	2	2	1	2	1	-	-	2	-	2	3	1	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126,

**Title of the Course:** Machine Learning  
**Category:** PC  
**Year:** III  
**Semester:** I  
**Course Code:** 24ACSM51T  
**Branch/es:** CSE, AI&ML, CSE(AIML) & CSE(IOTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	56

**Course Objectives:** The course is introduced for students

1. To understand the fundamentals, applications, and learning techniques of Machine Learning.
2. To learn and apply regression and classification algorithms for predictive analysis.
3. To analyze advanced machine learning methods including SVM and ensemble techniques.
4. To develop unsupervised learning models using clustering and dimensionality reduction methods.
5. To explore advanced machine learning concepts, model deployment, and real-world applications.

**Course Outcomes:**

After completion of the course, students will be able to:

1. Understand Machine Learning concepts, learning paradigms, and regression techniques.
2. Apply classification algorithms and evaluate model performance using suitable metrics.
3. Analyze and implement SVM and ensemble learning techniques for predictive modeling.
4. Develop clustering and dimensionality reduction models for unsupervised learning tasks.
5. Apply advanced machine learning concepts and deploy models for real-world applications

**Unit 1 Introduction to Machine Learning and Concept Learning 12**

Definition and Scope of Machine Learning, Applications and Types of Learning: Supervised, Unsupervised, Reinforcement, Linear Regression: Least Squares, Cost Function, Gradient Descent, Polynomial Regression and Overfitting, Evaluation Metrics: RMSE, MAE, R<sup>2</sup> Score, Bias-Variance Trade off.

Concept Learning: FIND –S Algorithm, Candidate Elimination Algorithm.

**Unit 2 Classification Algorithms 12**

Classification Overview and Decision Boundaries, Logistic Regression: Sigmoid Function and Cost, K Nearest Neighbors (KNN), Naïve Bayes Classifier, Decision Trees and Random Forests, Model Evaluation: Confusion Matrix, Precision, Recall, F1-Score.

**Unit 3 Support Vector Machines and Ensemble Methods 10**

Support Vector Machines: Concepts, Kernels, Hyperplane and Margin Concepts, Kernel Tricks: RBF and Polynomial, Ensemble Learning: Bagging, Boosting, and Voting, Gradient Boosting, AdaBoost, and XGBoost, Model Tuning and Hyperparameter Optimization.

**Unit 4 Unsupervised Learning Techniques 10**

Clustering Overview: Applications, K-Means Clustering Algorithm, Expectation- Maximization(EM) Algorithm, Principal Component Analysis (PCA) for Dimensionality Reduction, Silhouette Score, Davies-Bouldin Index for Cluster Validation.

**Unit 5 Neural Networks and Advanced Topics 12**

Artificial Neural Networks using Back propagation algorithm, Introduction to Deep Learning, Reinforcement Learning Basics and Markov Decision Processes, Cross-Validation Techniques: k-Fold, Leave-One-Out, Feature Engineering and Feature Selection, Deployment of ML Models (Flask, Streamlit, etc.), Case Studies: Medical Diagnosis, Spam Detection, Credit Scoring.

**Textbook:**

1. Tom Mitchell, Machine Learning, McGraw-Hill Education.

**Reference Books:**

1. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer.
2. Kevin P. Murphy, Machine Learning: A Probabilistic Perspective, MIT Press.
3. Christopher Bishop, Pattern Recognition and Machine Learning, Springer.

**Online Learning Resources:**

1. Coursera – Machine Learning by Andrew Ng (Stanford University)
2. Scikit-learn Documentation
3. Kaggle Learn – Machine Learning
4. Google’s Machine Learning Crash Course
5. YouTube – StatQuest with Josh Starmer

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSM51T.1	3	2	1	1	2	-	-	1	1	-	2	3	2	1
24ACSM51T.2	3	3	2	2	3	-	-	1	1	-	2	3	3	2
24ACSM51T.3	3	3	3	2	3	-	-	1	1	1	2	3	3	3
24ACSM51T.4	2	3	2	3	3	-	-	1	1	-	2	2	3	2
24ACSM51T.5	2	2	3	2	3	1	-	2	2	1	3	3	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamaya District, AP – 516126, INDIA

Title of the Course : Data Wrangling and Exploratory Data Analysis  
Category : PC  
Year : III  
Semester : I  
Course Code : 24AAIM51T  
Branch/es : AI&ML

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	52

### Course Objectives:

1. Understand the fundamentals of EDA and data wrangling using Python for structured data.
2. Apply data cleaning and pre-processing techniques to prepare high-quality datasets.
3. Extract and manage data from Excel, PDFs, and databases using Python and SQL.
4. Analyse and visualize data to uncover patterns and insights.
5. Perform real-world EDA and collect data through web scraping for machine learning.

### Course Outcomes:

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

1. Demonstrate understanding of EDA and perform data wrangling on structured datasets.
2. Apply data preprocessing techniques to handle missing values, duplicates, and outliers.
3. Extract, process, and integrate data from Excel files, PDFs, and relational databases.
4. Analyze data using statistical methods and visualize insights through various plots.
5. Conduct end-to-end EDA on real-world datasets and perform web scraping for data collection.

### Unit 1 Introduction to EDA and Data Wrangling 10

Introduction to Data Science and EDA, Importance of EDA in Data Science Life Cycle, What Is Data Wrangling, Importance of Data Wrangling, Tasks of Data Wrangling, Data Wrangling Tools, Introduction to Python for Data Wrangling, Python Basics for Data Wrangling, Handling Structured Data: CSV, JSON, and XML Formats, Data Meant to Be Read by Machines.

### Unit 2 Data Wrangling and Preprocessing 10

Handling Missing Data (mean, median, drop, and interpolation), Dealing with Duplicates, Removing duplicates and Fuzzy Matching, Outliers, and Anomalies, Encoding Categorical Variables (Label, One-hot), Data Transformation: Scaling, Normalization, Binning, Data Types Conversion and Data Type Casting, Measures of central tendency and disperency.

### Unit 3 Working with Excel Files, PDFs, and Databases 11

Installing Python Packages for Data Wrangling, Parsing Excel Files, Programmatic Approaches to PDF Parsing, Converting PDF to Text (pdfminer), Acquiring and Storing Data, Introduction to Databases for Data Wrangling, Relational Databases: MySQL, Data Exploration: Table functions and Joining Datasets.

**Unit 4 Exploratory Data Analysis****10**

Visualization with Matplotlib and Seaborn, Customizing Plots: Titles, Legends, Labels and Themes  
 Distribution Plots: Histograms, Boxplots, KDE, Bar Charts, Count Plots, Pie Charts, Scatter Plots, Pair Plots, Heatmaps, Correlation and Covariance Analysis, Advanced Visuals: Violin Plots, Strip Plots, Swarm Plots, Multivariate Visualization and Subplots

**Unit 5 EDA Case Studies and Web Scraping****11**

Step-by-step EDA on Sample Datasets (Titanic, Iris, Sales, etc.), Feature Engineering Techniques in EDA, EDA Report Generation using Python Notebooks, Preparing Data for Machine Learning Models, Web Scraping: What to Scrape and How, Analyzing and Parsing Web Pages with LXML and XPath, Advanced Web Scraping Using Selenium.

**Textbook:**

1. Jake VanderPlas, Python Data Science Handbook: Essential Tools for Working with Data, O'Reilly, 2016.

**Reference Books:**

1. Jacqueline Kazil and Katharine Jarmul, Data Wrangling with Python: Tips and Tools to Make Your Life Easier, O'Reilly Media, Sebastopol, CA, USA, 2016
2. Web Scraping with Python: Collecting More Data from the Modern Web" – Ryan Mitchell, O'Reilly Media.
3. Wes McKinney, Python for Data Analysis, 2nd Edition, O'Reilly, 2018.
4. Allen B. Downey, Think Stats: Probability and Statistics for Programmers, O'Reilly, 2014.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24AAIM51T.1	3	2	1	1	3	-	-	-	-	-	2	3	2	1
24AAIM51T.2	2	3	2	2	3	-	-	-	-	-	2	3	3	2
24AAIM51T.3	2	3	2	3	2	-	-	-	-	-	1	3	3	2
24AAIM51T.4	1	2	2	2	3	-	-	-	2	-	1	2	3	2
24AAIM51T.5	2	3	3	3	3	-	-	-	2	1	2	3	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course : **Quantum Computing**  
Category : PE  
Course Code : 24ACSE5DT  
Year : III  
Semester : I  
Branch : CSE, AI&ML, CSE(AI)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	52

## Course Objectives:

1. Introduce fundamentals and history of quantum computing.
2. Develop background in mathematics, physics, and biology for quantum systems.
3. Explain qubits and quantum circuit design.
4. Present key quantum algorithms and their significance.
5. Study quantum error correction and cryptography applications.

## Course Outcomes

1. Understand differences between classical and quantum computing.
2. Grasp core principles like superposition, entanglement, and measurement.
3. Analyze qubits and basic quantum circuits.
4. Evaluate major quantum algorithms.
5. Understand quantum error correction and impact on cryptography.

## UNIT – 1

10

History of Quantum Computing: Importance of Mathematics, Physics and Biology. Introduction to Quantum Computing: Bits Vs Qubits, Classical Vs Quantum logical operations

## UNIT – 2

12

Background Mathematics: Basics of Linear Algebra, Hilbert space, Probabilities and measurements. Background Physics: Paul's exclusion Principle, Superposition, Entanglement and super-symmetry, density operators and correlation, basics of quantum mechanics, Measurements in bases other than computational basis. Background Biology: Basic concepts of Genomics and Proteomics (Central Dogma)

## UNIT – 3

10

Qubit: Physical implementations of Qubit. Qubit as a quantum unit of information. The Bloch sphere  
Quantum Circuits: single qubit gates, multiple qubit gates, designing the quantum circuits. Bell states.

## UNIT – 4

10

Quantum Algorithms: Classical computation on quantum computers. Relationship between quantum and classical complexity classes. Deutsch's algorithm, Deutsch's-Jozsa algorithm, Shor's factorization algorithm, Grover's search algorithm.

## UNIT – 5

10

Noise and error correction: Graph states and codes, Quantum error correction, fault-tolerant computation. Quantum Information and Cryptography: Comparison between classical and quantum information theory. Quantum Cryptography, Quantum teleportation.

**TEXT BOOK:**

1. Nielsen M. A., Quantum Computation and Quantum Information, Cambridge.

**REFERENCE BOOKS:**

1. Quantum Computing for Computer Scientists by Noson S. Yanofsky and Mirco A. Mannucci
2. Benenti G., Casati G. and Strini G., Principles of Quantum Computation and Information, Vol.I: Basic Concepts, Vol II.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and	Life-long learning	PSO1	PSO2	PSO3
24ACSE5DT.1	3	2	-	-	1	-	-	-	-	-	-	2	2	-
24ACSE5DT.2	3	2	1	1	2	-	-	-	-	-	-	2	2	-
24ACSE5DT.3	3	3	2	2	2	-	-	-	1	1	-	2	3	-
24ACSE5DT.4	3	2	1	1	1	2	-	2	-	1	-	2	2	-
24ACSE5DT.5	3	3	2	2	2	1	-	1	-	1	-	3	3	-



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: Software Testing Methodologies

Category: PE

Couse Code: 24ACSE5AT

Year: III

Semester: I

Branch: CSE, AI&ML, CSE(AI)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	52

### Course Objectives:

1. To understand the fundamental concepts of software testing, including software testing objectives, the taxonomy of bugs
2. To analyze testing techniques such as path testing and transaction flow testing
3. To understand the concepts of data flow testing and its applications
4. To build the paths and decision tables for a software project
5. To apply the concepts of State Graphs, Transition testing and Graph Testing

### Course Outcomes:

1. Understand the concepts of software testing and taxonomy of bugs.
2. Construct control flow graphs for different programs.
3. Apply and Test the applications using different testing methods and automation tools.
4. Build paths and decision tables for various problems
5. Analyze state graphs for different problems and apply transition testing on them.

### Unit 1: Introduction 10

Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

### Unit 2: Flow Graphs and Path Testing 10

Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

### Unit 3: Transaction Flow Testing & Domain Testing 12

Transaction flows, transaction flow testing techniques. Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

Domain Testing: Domains and paths, Nice & ugly domains, domain testing, domains.

### Unit 4: Paths, Path Products and Regular Expressions 10

Path Products & Path Expression, Reduction Procedure, Applications, Regular Expressions & Flow Anomaly.

Detection. Logic Based Testing: Overview, Decision Tables, Path Expressions, KV Charts and Specifications.

### Unit 5 State, State graphs and Transaction Testing 10

State Graphs, Good & Bad State Graphs, State Testing, Testability Tips.

Graph Matrices and Application: Motivational Overview, Matrix of Graph, Relations, Power of a Matrix, Node Reduction Algorithm, Building Tools.

### Text Book:

1. Baris Beizer, *Software testing techniques*. Dreamtech, 2nd Ed.

**Reference books:**

1. Dr.K.V.K.K.Prasad, Software Testing Tools. Dreamtech.
2. Brian Marick, The craft of software testing. Pearson Education.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSE5AT.1	3	2	1	2	2	-	-	-	-	-	3	2	2	-
24ACSE5AT.2	3	2	1	2	2	-	-	-	-	-	3	2	2	-
24ACSE5AT.3	3	3	3	3	2	-	-	-	-	-	3	2	2	-
24ACSE5AT.4	3	3	3	3	2	-	-	-	-	-	3	2	2	-
24ACSE5AT.5	3	3	3	3	2	-	-	-	-	-	3	2	2	-



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course : AI CHATBOTS  
Category : PE  
Year : III  
Semester : I  
Course Code : 24AAIM5AT  
Branch/es : AI&ML

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	51

### Course Objectives:

- Knowledge on concepts of chatbots and understanding the developer environment bot framework.

### Course Outcomes:

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

1. Explain chatbot fundamentals, evolution, and platforms.
2. Set up a chatbot development environment and build a basic bot with database support.
3. Design intent- and entity-based conversational models.
4. Develop advanced chatbots using design principles and custom intent classifiers.
5. Analyze chatbot performance and design solutions for various business communication models.

**Unit 1** **10**  
Introduction to Chatbots: Definition of chatbots, Journey of Chatbots, Rise of Chatbots, Messaging Platforms

**Unit 2** **10**  
Setting Up the Developer Environment Botframework Local Installation, Installing NodeJS, Following the Development Pipeline, Storing Messages in Database.

**Unit 3** **9**  
Basics of Bot Building- Intents, Entities

**Unit 4** **10**  
Advanced Bot Building Design Principles, Showing Product Results, Saving Messages, Building Your Own Intent Classifier.

**Unit 5** **12**  
Analytics, Chatbot Use Cases- Modes of Communication- Business-to-Business (B2B), Chap Business to-Consumer (B2C) Consumer-to-Consumer (C2C) Business-to-Employee (B2E), Employee-to-Employee (E2E), Chatbots by Industry Vertical

### Textbook:

1. Rashid Khan and Anik Das, Build Better Chatbots: A Complete Guide to Getting Started with Chatbots, Apress (Springer Nature), Berkeley, CA, 2017

**Reference Books:**

1. Drexen Braxley: A Comprehensive Guide to AI: Elevate Your Daily Life, Increase Work Output, Secure Financial Gains, Foster Career Growth, and Cultivate Modern Talents Paperback
2. D. Nardo Publications, ChatGPT Made Simple How Anyone Can Harness AI To Streamline Their Work, Study & Everyday Tasks to Boost Productivity & Maintain Competitive Edge by Mastering Prompt Engineering
3. Robert E. Miller, Prompt Engineering Bible Join and Master the AI Revolutions Profit Online with GPT-4 & Plugins for Effortless Money Making!
4. Lucas Foster, Chat GPT Bible Developer and Coder Special Edition: Enhancing Coding Productivity with AI-Assisted Conversations.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24AAIM5AT.1	3	2	1	-	1	-	-	-	2	-	2	2	1	-
24AAIM5AT.2	3	2	3	1	3	-	-	1	1	1	2	3	2	1
24AAIM5AT.3	3	3	3	2	3	-	-	1	1	-	2	3	3	2
24AAIM5AT.4	3	3	3	2	3	-	-	2	1	1	2	3	3	2
24AAIM5AT.5	2	3	3	2	2	-	-	2	2	2	3	2	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamaya District, AP – 516126, INDIA

**Title of the Course:** Object Oriented Analysis and Design  
**Category:** PE  
**Year:** III  
**Semester:** I  
**Course Code:** 24ACSE5BT  
**Branch/es:** CSE, AI&ML, CSE(AI), CSE(AIML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	54

### Course Objectives:

1. Describe the activities in the different phases of the object-oriented development lifecycle.
2. Understand the concepts of object-oriented model with the E-R and EER models.
3. Model a real-world application by using UML diagram.
4. Design architectural modelling.
5. Describing an application of UML.

### Course Outcomes:

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

1. The importance of modelling in UML.
2. Compare and contrast the object-oriented model with the E-R and EER models.
3. Design use case diagram. Design an application using deployment diagram.
4. Apply UML diagrams to build library application.
5. Demonstrate the ability to implement standard design patterns.

<b>Unit 1</b>	10
Introduction to UML: Importance of modelling, principles of modelling, object-oriented modelling, conceptual model of the UML, Architecture, Software Development Life Cycle.	
<b>Unit 2</b>	12
Basic Structural Modelling: Classes, Relationships, common Mechanisms, and diagrams. Advanced Structural Modelling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages. Class & Object Diagrams: Terms, concepts, modelling techniques for Class & Object Diagrams.	
<b>Unit 3</b>	10
Basic Behavioural Modelling-I: Interactions, Interaction diagrams. Basic Behavioural Modelling-II: Use cases, Use case Diagrams, Activity Diagrams.	
<b>Unit 4</b>	12
Advanced Behavioral Modelling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.	
<b>Unit 5</b>	10
Architectural Modelling: Component Deployment, Component diagrams and Deployment diagrams. Case Study: The Unified Library application, ATM.	

**Text Book:**

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modelling Language User Guide, Pearson Education 2nd Edition.

**Reference Books:**

1. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, Cengage Learning
2. Meilir Page-Jones: Fundamentals of Object-Oriented Design in UML, Pearson Education.
3. Pascal Roques: Modelling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
<b>24ACSEBT.1</b>	3	2	1	1	1	-	-	-	-	-	2	2	1	-
<b>24ACSEBT.2</b>	3	3	2	2	3	-	-	-	-	-	2	3	2	-
<b>24ACSEBT.3</b>	3	3	2	2	1	-	-	-	-	-	3	2	2	-
<b>24ACSEBT.4</b>	3	3	3	3	2	-	-	-	-	-	3	2	2	-
<b>24ACSEBT.5</b>	3	3	3	3	3	-	-	2	2	2	3	3	3	1



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

**Title of the Course:** Computer Networks Lab  
**Category:** PC  
**Year:** III  
**Semester:** I  
**Course Code:** 24ACSE52L  
**Branch/es:** CSE, AI&ML, CSE(AI), CSE(AIML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

**Course Objectives:** This course is designed to

1. Understand the basic concepts of Computer Networks.
2. Introduce the layered approach for design of computer networks.
3. Expose the network protocols used in Internet environment.
4. Explain the format of headers of IP, TCP and UDP Familiarize with the applications of Internet
5. Familiarize with the applications of Internet

#### Course Outcomes:

After completion of the course, students will be able to

1. Understand the working principle of various communication protocols.
2. Understand the network simulator environment and visualize a network topology and observe its performance.
3. Analyze the traffic flow and the contents of protocol frames.
4. Critique the existing routing protocols.

**Note: It is suggested for every student to complete all the experiments in the semester.**

1. Simulate network topologies Star, Bus, Mesh and Ring using Packet Tracer Tool.
2. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
3. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
4. Implement Dijkstra's algorithm to compute the shortest path through a graph.
5. Implement and simulate algorithm for Distance vector routing protocol.
6. Implement and simulate algorithm for Link state routing protocol.
7. Install network simulator NS-2 in any of the Linux operating system and simulate wired and wireless scenarios.
8. Using Wireshark observe data transferred in client server communication using UDP and identify the UDP datagram

9. Using Wireshark observe Three Way Handshaking Connection Establishment, Data Transfer and Three-Way Handshaking Connection Termination in client server communication using TCP.
10. Design and configure a network with multiple subnets with wired and wireless LANs using required network devices. Configure the following services in the network- TELNET, SSH, FTP server, Web server, File server, DHCP server and DNS server.
11. Implement Simple Mail Transfer Protocol.
12. Create a simple LAN connection between two PCs using a switch in Packet Tracer and test connectivity using the ping command.
13. Configure IP addresses manually for hosts in different subnets and verify communication between them using a router.
14. Observe and analyze basic network packets such as ARP, ICMP, TCP, and UDP using Wireshark.

**Textbook:**

1. Andrew S.Tanenbaum, David j.wetherall, Computer Networks, 6th Edition, PEARSON.

**Reference Books:**

1. James F.Kurose, Keith W. Ross, Computer Networking: A Top-Down 6th edition, Pearson, 2019.
2. Computer Networks: A Systems Approach-Bruce Davie, VMware-Larry Peterson, Princeton University-2019.
3. Computer Networks–B. K. MathanNagan, T. Mahalakshmi- Charulatha Publications PrivateLimited-2019.
4. Computer Networks-Dr.Amol V. Dhumane Nitin N. Sakhare-NiraliPrakashan Publishers-2024
5. Data Communications and Networking with TCP/IP Protocol Suite-Behrouz A. Forouzan-McGraw Hill-6th Edition.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSE52T.1	3	2	1	1	2	-	-	-	1	-	2	3	-	2
24ACSE52T.2	3	3	1	2	2	-	-	-	1	-	2	3	-	1
24ACSE52T.3	3	2	2	2	2	1	-	-	1	-	2	3	-	1
24ACSE52T.4	3	2	2	1	2	-	-	-	1	-	2	3	-	1
24ACSE52T.5	3	2	2	1	2	1	-	-	2	-	2	3	1	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126,

**Title of the Course:** Machine Learning Lab  
**Category:** PC  
**Year:** III  
**Semester:** I  
**Course Code:** 24ACSM51L  
**Branch/es:** CSE, AI&ML, CSE(AIML) & CSE(IOTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

### Course Objectives:

1. Make use of Data sets in implementing the machine learning algorithms
2. Implement the machine learning concepts and algorithms in any suitable language of choice.

### Course Outcomes:

After completion of the course, students will be able to

1. Understand the Mathematical and statistical perspectives of machine learning algorithms through python programming
2. Appreciate the importance of visualization in the data analytics solution.
3. Derive insights using Machine learning algorithms

### List of Experiments:

#### Note:

- a. The programs can be implemented in either JAVA or Python.
- b. For Problems 1 to 6 and 10, programs are to be developed without using the built-in classes or APIs of Java/Python.
- c. Data sets can be taken from standard repositories (<https://archive.ics.uci.edu/ml/datasets.html>) or constructed by the students.
- d. **It is suggested for every student to complete all the experiments in the semester.**

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.
3. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
4. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.

6. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.
7. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.
8. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.
9. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
10. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.
11. Write a program to implement the Support Vector Machine (SVM) algorithm for classification using a suitable data set stored in a .CSV file. Evaluate the performance of the classifier using accuracy and confusion matrix.
12. Implement the Random Forest algorithm for classification on a given data set. Compare its performance with the Decision Tree algorithm and analyze the results.
13. Write a program to perform Principal Component Analysis (PCA) for dimensionality reduction on a given data set. Visualize the transformed data using graphs.
14. Implement the Linear Regression algorithm to predict values from a given training data set stored in a .CSV file. Plot the regression line and calculate the prediction error.

### **Projects**

1. Predicting the Sale price of a house using Linear regression
2. Spam classification using Naïve Bayes algorithm
3. Predict car sale prices using Artificial Neural Networks
4. Predict Stock market trends using LSTM
5. Detecting faces from images

### **Reference Book:**

1. Python Machine Learning Workbook for Beginners: AI Publishing LLC (AI Sciences), 2020.

### **Online Learning Resources/ Virtual Labs:**

1. Machine Learning A-Z (Python & R in Data Science Course) | Udemy
2. Machine Learning | Coursera

**CO-PO Mapping:**

<b>Course Outcomes</b>	<b>Engineering Knowledge</b>	<b>Problem Analysis</b>	<b>Design/Development of solutions</b>	<b>Conduct investigations of complex problems</b>	<b>Engineering tool usage</b>	<b>The engineer and The world</b>	<b>Ethics</b>	<b>Individual and Collaborative team work</b>	<b>Communication</b>	<b>Project management and finance</b>	<b>Life-long learning</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>24ACSM51L-1</b>	3	2	1	1	2	-	-	-	-	2	3	2	2	-
<b>24ACSM51L-2</b>	3	3	2	2	2	-	-	-	-	2	3	2	2	-
<b>24ACSM51L-3</b>	3	3	3	3	2	-	-	1	-	2	3	2	2	-
<b>24ACSM51L-4</b>	3	3	3	3	3	-	-	2	1	2	3	2	2	-
<b>24ACSM51L-5</b>	3	3	3	3	3	-	-	3	2	3	3	2	2	-



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

<b>Title of the Course:</b>	<b>DATA WRANGLING AND EXPLORATORY DATA ANALYSIS LAB</b>
<b>Category:</b>	PC
<b>Year</b>	III
<b>Semester:</b>	I
<b>Course Code:</b>	24AAIM51L
<b>Branch/es:</b>	AI&ML

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

**Course Objectives:** This course will be able to

1. To provide practical exposure to data wrangling and exploratory data analysis using Python.
2. To enable students to clean, preprocess, and transform structured datasets.
3. To develop skills in extracting data from Excel, PDFs, and databases.
4. To apply visualization techniques to analyze and interpret data.
5. To perform real-world EDA workflows and web scraping for data collection.

**Course Outcomes:**

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

1. Perform data wrangling operations on structured datasets using Python.
2. Handle missing values, duplicates, and outliers effectively.
3. Extract and integrate data from Excel, PDFs, and relational databases.
4. Analyze datasets using statistical methods and visualization tools.
5. Conduct end-to-end EDA and collect data through web scraping.

**Note:** It is suggested for every student to complete all the experiments in the semester.

## 1. Python Environment Setup and Basics

- a) Install and configure Python, Jupyter Notebook / Google Colab
- b) Perform basic operations: variables, data types, lists, dictionaries

## 2. Data Loading and Inspection

- a) Load datasets from CSV, JSON files using Pandas
- b) Perform inspection using head(), tail(), shape, info(), describe()

## 3. Handling Missing Data

- a) Identify missing values using isnull()
- b) Apply techniques: mean, median, mode imputation
- c) Use dropna() and interpolation

## 4. Handling Duplicates and Inconsistencies

- a) Detect duplicate rows using duplicated()
- b) Remove duplicates using drop\_duplicates()
- c) Handle inconsistent data (case mismatch, formatting issues)

## 5. Data Transformation and Type Conversion

- a) Convert data types (astype())
- b) Perform string operations and datetime parsing
- c) Apply normalization and standardization

## 6. Encoding and Feature Engineering

- a) Apply Label Encoding and One-Hot Encoding
- b) Perform binning and discretization
- c) Create new derived features

## 7. Working with Excel Files

- a) Read Excel files using Pandas
- b) Write data into Excel files
- c) Perform multi-sheet data extraction

## 8. PDF Data Extraction

- a) Extract text from PDF using Python libraries
- b) Convert PDF data into structured format (DataFrame)

## 9. Database Operations

- a) Connect to SQLite/MySQL database
- b) Perform CRUD operations (Create, Read, Update, Delete)
- c) Execute SQL queries and joins

## 10. Data Visualization

- a) Create plots using Matplotlib (line, bar, histogram)
- b) Use Seaborn for advanced plots (boxplot, heatmap, pairplot)
- c) Customize plots (titles, labels, legends)

## 11. Exploratory Data Analysis

3

- a) Perform univariate and bivariate analysis
- b) Detect outliers using boxplots and IQR
- c) Analyze correlations using heatmaps

## 12. Mini Project (EDA + Web Scraping)

3

- a) Scrape data using BeautifulSoup/Selenium
- b) Clean and preprocess the collected dataset
- c) Perform complete EDA and visualization
- d) Prepare dataset for machine learning

### Text Book:

1. Jake VanderPlas, Python Data Science Handbook: Essential Tools for Working with Data, O'Reilly, 2016.

### Reference Books:

1. Jacqueline Kazil & Katharine Jarmul, Data Wrangling with Python, O'Reilly
2. Ryan Mitchell, Web Scraping with Python, O'Reilly
3. Wes McKinney, Python for Data Analysis, O'Reilly
4. Allen B. Downey, Think Stats, O'Reilly

### Online Learning Resources:

- NPTEL – Data Science for Engineers
- Coursera – Applied Data Science with Python (University of Michigan)
- Kaggle (Datasets & Practice)
- Google Colab Documentation
- Pandas & NumPy Official Documentation

**CO-PO Mapping:**

<b>Course Outcomes</b>	<b>Engineering Knowledge</b>	<b>Problem Analysis</b>	<b>Design/Development of solutions</b>	<b>Conduct investigations of complex problems</b>	<b>Engineering tool usage</b>	<b>The Engineer and world</b>	<b>Ethics</b>	<b>Individual and Collaborative teamwork</b>	<b>Communication</b>	<b>Project management and finance</b>	<b>Life-long learning</b>
<b>24AAIM51L.1</b>	3	2	1	1	3	-	-	-	-	-	2
<b>24AAIM51L.2</b>	2	3	2	2	3	-	-	-	-	-	2
<b>24AAIM51L.3</b>	2	3	2	3	2	-	-	-	-	-	1
<b>24AAIM51L.4</b>	1	2	2	2	3	-	-	-	-	-	1
<b>24AAIM51L.5</b>	2	3	3	3	3	-	-	2	-	1	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

**Title of the Course:** GENDER SENSITIZATION  
**Category:** MC  
**Couse Code:** 24AAUD51T  
**Branch/es:** Common to all branches  
**Year:** III  
**Semester:** I

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
2	0	0	0	32

### Course Objectives:

1. To enable students to understand the gender related issues, foster humane attitude and creative thinking
2. To familiarize them about constitutional safeguard for gender equality
3. To expose students to debates on the politics and economics of work and disclination
4. To help students reflect critically on gender violence
5. To make them understand that gender identities and gender relations are part of culture as they shape the way daily life is lived in the family as well as wider community and the workplace.

### Course Outcomes:

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

1. Understand the basic concepts of gender and its related terminology.
2. Identify the biological, sociological, psychological and legal aspects of gender.
3. Use the knowledge in understanding how gender discrimination works in our society and how to counter it.
4. Analyze the gender division of labor and its relation to politics and economics.
5. Appraise how gender-role beliefs and sharing behavior are associated with more well-being

### Unit 1 UNDERSTANDING GENDER 6

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.

### Unit 2 GENDER ROLES AND RELATIONS 6

Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and its Consequences- Declining Sex Ratio-Demographic Consequences-Gender Spectrum.

### Unit 3 GENDER AND LABOUR 7

Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work". "Share the Load"- Unrecognized and Unaccounted work -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

### Unit 4 GENDER-BASED VIOLENCE 7

The Concept of Violence- Types of Gender-based Violence- Human Rights Perspective-Sexual Harassment - Domestic Violence - Different forms of violence against women - Causes of violence, impact of violence against women - Consequences of gender-based violence.

Gender and Films-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender-Gender Sensitive Language- Just Relationships

**Textbooks:**

1. A.Suneetha, Uma Bhugubanda, et al. Towards a World of Equals: A Bilingual Textbook on Gender, Telugu Akademi, Telangana, 2015.
2. Butler, Judith. Gender Trouble: Feminism and the Subversion of Identity. UK Paperback Edn. March 1990

**Reference Books:**

1. Wtatt, Robin and Massood, Nazia, Broken Mirrors: The dowry Problems in India, London : Sage Publications, 2011.
2. Datt, R. and Kornberg, J.(eds), Women in Developing Countries, Assessing Strategies for Empowerment, London: Lynne Rienner Publishers, 2002.
3. Brush, Lisa D., Gender and Governance, New Delhi, Rawat Publication, 2007.
4. Singh, Direeti, Women and Politics World Wide, New Delhi, Axis Publications, 2010 5.
5. Raj Pal Singh, Anupama Sihag, Gender Sensitization: Issues and Challenges (English, Hardcover), Raj Publications, 2019.
6. A.Revathy& Murali, Nandini, A Life in Trans Activism(Lakshmi Narayan Tripathi). The University of Chicago Press, 2016.

**Online Learning Resources():**

1. Understanding Gender chrome-extension:  
//kdpelmjpfafjppnhbloffcjpeomlnpah/https://www.arvindguptatoys.com/arvindgupta/kamla-gender1.pdf [https://onlinecourses.swayam2.ac.in/nou24\\_hs53/preview](https://onlinecourses.swayam2.ac.in/nou24_hs53/preview)
2. Gender Roles and Relations  
<https://www.plannedparenthood.org/learn/gender-identity/sex-gender-identity/what-are-gender-roles-and-stereotypes>  
<https://www.verywellmind.com/understanding-gender-roles-and-their-effect-on-our-relationships-7499408>  
[https://onlinecourses.swayam2.ac.in/cec23\\_hs29/preview](https://onlinecourses.swayam2.ac.in/cec23_hs29/preview)
3. Gender and Labour  
<https://www.economicsobservatory.com/what-explains-the-gender-division-of-labour-and-how-can-it-be-redressed>  
[https://onlinecourses.nptel.ac.in/noc23\\_mg67/preview](https://onlinecourses.nptel.ac.in/noc23_mg67/preview)
4. GENDER-BASED VIOLENCE  
[https://eige.europa.eu/gender-based-violence/what-is-gender-based-violence?language\\_content\\_entity=en](https://eige.europa.eu/gender-based-violence/what-is-gender-based-violence?language_content_entity=en)  
<https://www.worldbank.org/en/topic/socialsustainability/brief/violence-against-women-and-girls>  
[https://onlinecourses.swayam2.ac.in/nou25\\_ge38/preview](https://onlinecourses.swayam2.ac.in/nou25_ge38/preview)
5. GENDER AND CULTURE  
<https://gender.study/psychology-of-gender/culture-impact-gender-roles-identities/>  
<https://sociology.iresearchnet.com/sociology-of-culture/gender-and-culture/>  
<https://archive.nptel.ac.in/courses/109/106/109106136/>



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

<b>Title of the Course:</b>	NATURAL LANGUAGE PROCESSING
<b>Category:</b>	PC
<b>Year:</b>	III
<b>Semester:</b>	II
<b>Course Code:</b>	24ACSM62T
<b>Branch/es:</b>	CSE, AIML, CSE(AI), CSE(AIML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	54

## COURSE OBJECTIVES:

1. To provide a strong foundation in the principles and techniques of Natural Language Processing (NLP).
2. To introduce classical and deep learning-based approaches to NLP tasks.
3. To enable students to build and evaluate models for various NLP applications such as text classification, sentiment analysis, and machine translation.
4. To expose students to modern tools and libraries used in NLP such as NLTK, SpaCy, and Hugging Face Transformers.
5. To provide insights into the challenges of multilingual NLP and ethical concerns.

## COURSE OUTCOMES:

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

1. Understand the fundamentals and challenges of natural language understanding.
2. Apply linguistic preprocessing techniques such as tokenization, stemming, POS tagging, and parsing.
3. Implement NLP algorithms for tasks like classification, translation, and information retrieval.
4. Develop deep learning models using RNNs, LSTMs, and Transformer-based architectures for NLP.
5. Use NLP tools and libraries to analyze and interpret natural language data in real-world scenarios.

### UNIT 1: Fundamentals of Natural Language Processing 10

Introduction to NLP: Definitions, Applications, Challenges, Linguistic Essentials: Syntax, Semantics, Pragmatics, Text Processing: Tokenization, Lemmatization, Stemming, Stopword Removal, Normalization, and N-gram Generation, POS Tagging and Named Entity Recognition, NLP Libraries: NLTK, SpaCy Overview.

### UNIT 2: Text Representation and Statistical NLP 12

Bag of Words and TF-IDF, Language Modeling: Unigrams, Bigrams, N-gram Models, Word Embeddings: Word2Vec, GloVe, FastText, Cosine Similarity and Distance Measures, Text Classification using Naive Bayes and SVM, Evaluation Metrics: Accuracy, Precision, Recall, F1.

### UNIT 3: Deep Learning for NLP 12

Neural Network Basics for NLP, Recurrent Neural Networks (RNNs) and Limitations, LSTM and GRU Networks, Sequence Labeling: POS Tagging, NER using Bi-LSTM, Text Classification using CNNs and RNNs, Model Evaluation and Hyperparameter Tuning.

### UNIT 4: Transformers and Advanced NLP 10

Attention Mechanism and Self-Attention, Transformer Architecture: Encoder-Decoder Models, Pretrained Language Models: BERT, RoBERTa, GPT, Fine-tuning Transformers for Text Classification, Question Answering and Text Summarization using Transformers, Sentiment Analysis and Zero-shot Classification.

**UNIT 5: Applications, Ethics, and Multilingual NLP****10**

Machine Translation: Rule-based vs Neural MT, Chatbots and Conversational AI, Information Retrieval and Question Answering, Speech-to-Text and Text-to-Speech Overview, Multilingual NLP and Low-Resource Languages, Bias, Fairness, and Ethics in NLP.

**TEXTBOOKS:**

1. Daniel Jurafsky and James H. Martin, Speech and Language Processing, Pearson Education.
2. Steven Bird, Ewan Klein, Edward Loper, Natural Language Processing with Python, O'Reilly Media.
3. Yoav Goldberg, Neural Network Methods in NLP, Morgan & Claypool.

**REFERENCE BOOKS:**

1. Jacob Eisenstein, Introduction to Natural Language Processing, MIT Press.
2. Delip Rao and Brian McMahan, Natural Language Processing with PyTorch, O'Reilly.
3. Thushan Ganegedara, Transformers for Natural Language Processing, Packt Publishing.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSM62T.1	3	2	-	-	-	-	-	-	-	-	2	2	-	-
24ACSM62T.2	3	3	2	-	2	-	-	-	-	-	2	3	2	2
24ACSM62T.3	3	3	3	2	3	-	-	-	-	-	2	3	2	2
24ACSM62T.4	3	3	3	3	3	-	-	-	-	-	3	2	-	3
24ACSM62T.5	3	3	3	3	3	2	-	2	2	-	3	3	3	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course: AI FOR CLOUD COMPUTING  
Category : PC  
Year : III  
Semester : II  
Course Code : 24ACAI62T  
Branch/es : AI&ML, CSE(AI)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	52

### Course Objectives:

1. To introduce the concepts, models, and services of cloud computing and its role in AI.
2. To explore the architecture and deployment of AI applications on cloud platforms.
3. To equip students with skills in using cloud-based tools and services for AI/ML workloads.
4. To understand data storage, processing, and security in cloud for AI tasks.
5. To apply cloud computing principles to real-world AI-based solutions.

### Course Outcomes:

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

1. Explain cloud computing architecture, services, and deployment models.
2. Utilize cloud platforms (AWS, GCP, Azure) for training and deploying AI models.
3. Handle large-scale data storage and processing in the cloud environment.
4. Integrate AI workflows using serverless and container-based architectures.
5. Analyze challenges in security, cost, scalability, and performance of cloud-based AI systems.

### Unit 1 INTRODUCTION TO CLOUD COMPUTING AND AI INTEGRATION 10

Basics of Cloud Computing: Characteristics, Models, and Services, Cloud Service Models: IaaS, PaaS, SaaS, Deployment Models: Public, Private, Hybrid, Community, AI and Cloud Convergence: Benefits and Challenges, Use Cases of AI in Cloud: NLP, Vision, Analytics, Overview of Cloud Providers for AI: AWS, Azure, GCP.

### Unit 2 STORAGE, COMPUTING, AND DATA PROCESSING IN THE CLOUD 10

Cloud Storage Services: S3, Blob, BigQuery, Virtualization and Elastic Computing, Distributed Computing with Hadoop and Spark, Data Ingestion and Processing Pipelines, Data Lakes and Warehousing in the Cloud, Cost Optimization for Storage and Compute Resources.

### Unit 3 CLOUD-BASED MACHINE LEARNING AND DEEP LEARNING 10

ML Services on AWS (SageMaker), Azure ML, GCP Vertex AI, Training and Deploying Models on Cloud, AutoML and Custom ML Model Workflows, GPUs/TPUs for Model Training, Experiment Tracking and Model Evaluation, Integration of Notebooks (Jupyter, Colab) with Cloud Storage.

### Unit 4 ADVANCED CLOUD CONCEPTS FOR AI APPLICATIONS 12

Containers and Docker for AI Applications, Kubernetes and Cloud-native AI Workflows, Serverless Computing: AWS Lambda, Azure Functions, CI/CD Pipelines for AI Models in Cloud, Scaling AI Applications using Load Balancers and Auto-Scaling. Monitoring and Logging in Cloud for AI Workflows.

**Unit 5 SECURITY, ETHICS, AND CASE STUDIES IN CLOUD AI**

10

Security and Privacy in Cloud-based AI, Identity and Access Management (IAM) in Cloud, Cost Management and Billing for AI Services, Ethical Issues and Fairness in Cloud AI, Case Study: AI in Healthcare Cloud Solutions, Case Study: Real-Time Analytics in Financial Cloud Services.

**Textbook:**

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, Mastering Cloud Computing, McGraw-Hill.

**Reference Books:**

1. Judith Hurwitz et al., Cloud Computing for Dummies, Wiley.
2. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACAI62T.1	3	2	-	-	1	-	-	-	-	-	2	3	2	1
24ACAI62T.2	2	3	2	2	3	-	-	-	-	3	2	3	3	2
24ACAI62T.3	2	2	3	2	3	-	-	-	-	-	3	3	3	2
24ACAI62T.4	2	2	3	2	3	-	-	2	-	2	2	3	3	3
24ACAI62T.5	2	2	2	-	2	-	-	-	-	3	2	3	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

**Title of the Course:** Data Visualization

**Category:** PC

**Year:** III

**Semester:** II

**Course Code:** 24ACSM61T

**Branches:** CSE, AI&ML, CSE(AIML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Credits
3	0	0	3	52

## COURSE OBJECTIVES

1. To understand the principles, techniques, and tools of data visualization.
2. To develop the ability to transform data into visual insights using different types of charts and plots.
3. To introduce the cognitive and perceptual foundations of effective data visualization.
4. To apply tools and programming environments (like Python, Tableau, or Power BI) for creating interactive and dynamic visualizations.
5. To analyze real-world datasets and effectively communicate data-driven findings visually.

## COURSE OUTCOMES

1. Interpret different types of data and recognize the appropriate visualization methods.
2. Design effective and interactive data visualizations using various tools.
3. Apply visual encoding and perceptual principles in presenting complex data.
4. Analyze and visualize real-world data sets using Python libraries and dashboards.
5. Create visual stories and dashboards for effective communication of insights.

## UNIT 1 - INTRODUCTION TO DATA VISUALIZATION & PERCEPTION 10

Introduction to Data Visualization, Importance and Scope of Data Visualization, Data Types and Sources, Visual Perception: Pre-attentive Processing, Gestalt Principles, Data-Ink Ratio, Data Density, Lie Factor, Visualization Process and Design Principles, Tools Overview: Tableau, Power BI, Python Libraries.

## UNIT 2 - VISUALIZATION TECHNIQUES FOR CATEGORICAL & QUANTITATIVE DATA 10

Charts for Categorical Data: Bar Charts, Pie Charts, Column Charts, Charts for Quantitative Data: Histograms, Line Charts, Boxplots, Scatter Plots, Bubble Charts, Heatmaps, Choosing the Right Chart Type, Best Practices in Labeling, Coloring, and Scaling.

## UNIT 3 - MULTIDIMENSIONAL, TEMPORAL AND HIERARCHICAL DATA VISUALIZATION 12

Visualizing Multivariate Data: Parallel Coordinates, Radar Charts, Time-Series Visualization: Time Plots, Animation over Time, Geographic Data Visualization: Maps, Choropleths, Hierarchical Data: Treemaps, Sunburst Charts, Network and Graph Visualization.

## UNIT 4 - DATA VISUALIZATION USING PYTHON AND DASHBOARDS 10

Introduction to Matplotlib, Seaborn, and Plotly, Creating Static and Interactive Charts, Pandas Visualization Capabilities, Dashboards with Dash, Streamlit, Power BI, Case Studies: Real-world Dataset Visualization.

## UNIT 5 - STORYTELLING WITH DATA AND ETHICAL VISUALIZATION 10

Storytelling and Narrative Techniques in Visualization, Dashboards and Reporting, Misleading Visualizations and Bias, Ethical Principles in Data Visualization, Final Project: Create a Storytelling Dashboard with Real Data.

### TEXT BOOKS

1. Tamara Munzner, Visualization Analysis and Design, CRC Press, 2014.
2. Nathan Yau, Data Points: Visualization That Means Something, Wiley, 2013.

### REFERENCE BOOKS

1. Alberto Cairo, The Truthful Art: Data, Charts, and Maps for Communication, New Riders, 2016.
2. Cole Nussbaumer Knaflic, Storytelling with Data: A Data Visualization Guide for Business Professionals, Wiley, 2015.
3. Claus O. Wilke, Fundamentals of Data Visualization, O'Reilly, 2019.
4. Rohan Chopra, Hands-On Data Visualization with Bokeh, Packt Publishing, 2019.

### ONLINE LEARNING RESOURCES

1. NPTEL: Data Visualization - IIT Madras
2. Coursera: Data Visualization with Python by IBM

### CO-PO MAPPING:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSM61T.1	3	2	-	-	-	-	-	-	-	-	-	2	-	-
24ACSM61T.2	3	3	2	-	-	-	-	-	-	-	-	3	2	2
24ACSM61T.3	3	3	2	1	-	-	-	-	-	-	-	3	2	2
24ACSM61T.4	3	2	-	2	-	-	-	-	-	-	3	2	-	3
24ACSM61T.5	3	3	3	2	2	-	-	-	1	1	3	3	3	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

**Title of the Course** Internet of Things  
**Category** PE  
**Year:** III  
**Semester** II  
**Course Code** 24ACSM6AT  
**Branch** AI&ML, CSE(AI), CSE(AIML)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	50

### Course Objectives:

1. Understand the terminology, technology and its applications of IoT.
2. Know the concept of M2M (machine to machine) with necessary protocols.
3. Memorize the software platforms which are used for developing the applications.
4. Learn the concepts of python programming language which is used to develop the IoT projects.
5. Know the hardware platforms which are necessary to develop the IoT applications.

### Course Outcomes:

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

1. Understand the vision of IoT from a global context
2. Identify the difference between IoT and M2M communication.
3. Determine the usage of 6LoWPAN and select the appropriate network protocols for IoT project.
4. Develop the IoT experiments with the help of Python programs.
5. Design the IoT applications using Raspberry Pi kit.

### Unit 1 Introduction to Internet of Things 10

Introduction to Internet of Things, History of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels & Deployment Templates, Applications of IoT.

### Unit 2 IoT and M2M & IoT Platforms Design Methodology 9

IoT and M2M: Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT. IoT Platforms Design Methodology: Introduction, IoT Design Methodology.

### Unit 3 The Wireless Embedded Internet 10

Introduction to 6LoWPAN, the 6LoWPAN Architecture, The Basic 6LoWPAN Format, Addressing MQ telemetry transport for sensor networks (MQTT-S), ZigBee compact application protocol, Contiki and uIPv6, Wireless RFID Infrastructure.

### Unit 4 IoT Systems- Logical Design Using Python 11

Introduction, Installing Python, Python Data Types and Data Structures, Control Flow, Functions, Modules, Packages and File Handling.

### Unit 5 IoT Physical Devices and Endpoints 10

What is an IoT Device, Exemplary Device: Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python, Other IoT Devices.

**Text Books:**

1. Internet of Things, A Hands-On Approach, Arshdeep Bahga, Vijay Madiseti, University Press, 2015.
2. 6LoWPAN: The Wireless Embedded Internet, Zach Shelby and Carsten Bormann, Wiley publications, first edition, 2009. (Unit III).

**Reference Books:**

1. The Internet of Things Connecting Objects to the Web, Hakima Chaouchi, Wiley publications, 2010.
2. Designing the Internet of Things, Adrian McEwen, Hakim Cassimally, Wiley 2014.
3. Enterprise IoT, A Definitive Handbook by Naveen Balani.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSM6AT.1	2	2	2	3	3	-	-	2	-	-	3	3	2	-
24ACSM6AT.2	2	3	2	3	3	-	-	2	-	-	3	3	2	-
24ACSM6AT.3	2	3	3	3	3	-	-	2	-	-	3	2	2	-
24ACSM6AT.4	3	3	3	2	3	-	-	2	-	-	3	3	3	-
24ACSM6AT.5	3	3	3	3	3	-	-	3	-	-	3	3	3	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

**Title of the Course:** Software Project Management  
**Category:** PE  
**Year:** III  
**Semester:** II  
**Course Code:** 24ACSE6AT  
**Branch/es:** CSE, AI&ML, CSE(AI), CSE(AI ML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	54

### Course Objectives:

1. Understand the basics of the project management and requirements management throughout the product development cycle.
2. To Know the distinction between conventional and modern approaches for developing a software project.
3. Learn about the life cycle phases and artifacts in software development process.
4. Understand the importance of Work breakdown structures and responsibilities while working in a real time projects.
5. Know how to measure the software quality and risk management in a modern project profiles

### Course Outcomes:

After completion of the course, students will be able to

1. Understand the conventional software Management and Software Economics factors that affect the development of a software project.
2. Recognize Artifacts of the software process and can also use artifacts in Software Development lifecycle.
3. Analyze the workflows and can create check points of process in a project management
4. Organize the work breakdown structures and assign the roles & responsibilities in a project organization for establishing an active network.
5. Apply project metrics in managing software project

### Unit 1

12

**Conventional Software Management:** The water fall model, conventional software Management performance Evolution of Software Economics: Software Economics. Pragmatic Software Cost Estimation Improving Software Economics: Reducing Software Product Size, Improving Software Processes, Improving Team Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

### Unit 2

10

**The old way and the new:** The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Lifecycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

**Artifacts of the process:** The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts

**Unit 3****12****Workflows of the process:** Software process workflows, Inter Trans workflows.**Check points of the Process:** Major Mile Stones, Minor Milestones, Periodic status assessments.**Iterative Process Planning:** work break down structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning**Unit 4****10****Process Automation:** Automation Building Blocks, The Project Environment. Project Control and**Process instrumentation:** The seven core Metrics, Management indicators, quality indicators**Tailoring the Process:** Process discriminants. Managing people and organizing teams.**Unit 5****10****Project Organizations and Responsibilities:** Line-of-Business Organizations, Project Organizations, evolution of Organizations.**Future Software Project Management:** modern Project Profiles, Next generation Software economics, modern process transitions.**Case Study:** The Command Center Processing and Display System-Replacement (CCPDS-R)**Text books:**

1. Software Project Management, Walker Royce, Pearson Education,2012
2. Bob Hughes, Mike Cotterell and RajibMall–SoftwareProjectManagement,6thEdition, Mc Graw Hill Edition, 2017

**Reference Books:**

1. Pankaj Jalote, –SoftwareProjectManagementinpractice,5<sup>th</sup> Edition, Pearson Education, 2017.
2. Murali K.Chemuturi, Thomas M.Cagley Jr.Mastering Software Project Management: Best Practices, Tools and Techniques||, J.Ross Publishing, 2010
3. Sanjay Mohapatra, –Software Project Management, Cengage Learning,2011

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and Life-long learning	PSO1	PSO2	PSO3	
24ACSE6AT.1	3	2	-	-	-	-	-	-	-	-	2	2	2	1
24ACSE6AT.2	3	2	1	1	1	-	-	-	-	-	2	2	2	2
24ACSE6AT.3	2	3	2	2	1	-	-	-	1	1	2	2	3	2
24ACSE6AT.4	2	2	3	1	1	1	-	1	3	2	3	2	2	3
24ACSE6AT.5	3	3	2	2	2	1	-	1	1	2	3	3	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamaya District, AP – 516126, INDIA

---

Title of the Course:	<b>CRYPTOGRAPHY &amp; NETWORK SECURITY</b>				
Category:	PC				
Course Code:	24ACSM6BT				
Year:	III				
Semester:	II				
Branch:	CSE, AI&ML, CSE(AI), CSE (IoTCSBCT)				
Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours	
3	0	0	3	51	

**Course Objectives:** This course aims at training students to master the:

1. The concepts of classical encryption techniques and concepts of finite fields and number theory
2. Working principles and utilities of various cryptographic algorithms including secret key cryptography, hashes, and message digests, and public key algorithms
3. Design issues and working principles of various authentication protocols, PKI standards
4. Various secure communication standards including Kerberos, IPsec, TLS and email
5. Concepts of cryptographic utilities and authentication mechanisms to design secure applications

**Course Outcomes:**

After completion of the course, students will be able to

1. Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory
2. Compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
3. Apply the knowledge of cryptographic check sums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
4. Demonstrate the ability to apply user authentication principles including Kerberos for secure authentication
5. Gain proficiency in securing web communications using TLS and HTTPS, manage secure remote access with SSH, and design firewall policies

**Unit 1 Computer and Network Security Concepts 11**

**Computer and Network Security Concepts:** Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security.

**Classical Encryption Techniques:** Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Steganography.

**Unit 2 Number Theory 10**

The Euclidean Algorithm, Modular Arithmetic, Fermat's and Euler's Theorems, The Chinese Remainder Theorem, Discrete Logarithms.

**Finite Fields:** Finite Fields of the Form  $GF(p)$ , Finite Fields of the Form  $GF(2^n)$ .

**Public Key Cryptography:** Principles, Public Key Cryptography Algorithms, RSA Algorithm, Diffie Hellman Key Exchange, Elliptic Curve Cryptography.

**Block Ciphers:** Traditional Block Cipher Structure, The Data Encryption Standard, Advanced Encryption Standard: AES Structure, AES Transformation Functions.

**Unit 3 Cryptographic Hash Functions**

10

**Cryptographic Hash Functions:** Application of Cryptographic Hash Functions, Requirements & Security, Secure Hash Algorithm, Message Authentication Functions, Requirements & Security, HMAC &CMAC. Digital Signatures: NIST Digital Signature Algorithm, Distribution of Public Keys, X.509 Certificates, Public- Key Infrastructure

**Unit 4 User Authentication**

10

**User Authentication:** Remote User Authentication Principles, Kerberos. Electronic Mail Security: Pretty Good Privacy (PGP) And S/MIME.

**IP Security:** IP Security Overview, IP Security Policy, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange.

**Unit 5 Transport Level Security**

10

**Transport Level Security:** Web Security Requirements, Transport Layer Security (TLS), HTTPS, Secure Shell (SSH).

**Firewalls:** Fire wall Character is tics and Access Policy, Types of Fire walls, Fire wall Location and Configurations.

**Textbook:**

1. Cryptography and Network Security – William Stallings, Pearson Education, 8<sup>th</sup> Edition.

**Reference Books:**

1. Cryptography, Network Security and Cyber Laws–Bernard Menezes,Cengage Learning, 2010 edition
2. Cryptography and Network Security-BehrouzA Forouzan, Debdeep Mukhopadhyaya, McGraw Hill, 3<sup>rd</sup> Edition, 2015.
3. Network Security Illustrated, Jason Albanese and Wes Sonnenreich, MGH Publishers, 2003.

**Online Learning Resources:**

1. <https://nptel.ac.in/courses/106/105/106105031/lecture>
2. <https://nptel.ac.in/courses/106/105/106105162/lecturebyDr.SouravMukhopadhyayIITKharagpur>[Video Lecture]
3. <https://www.mitel.com/articles/web-communication-cryptography-and-network-securityweb> articles by Mitel Power Connections

**CO-PO Mapping:**

<b>Course Outcomes</b>	<b>Engineering Knowledge</b>	<b>Problem Analysis</b>	<b>Design/Development of solutions</b>	<b>Conduct investigations of complex problems</b>	<b>Engineering tool usage</b>	<b>The engineer and The world</b>	<b>Ethics</b>	<b>Individual and Collaborative team work</b>	<b>Communication</b>	<b>Project management and finance</b>	<b>Life-long learning</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>24ACSM6BT.1</b>	3	2	1	1	2	-	-	-	-	-	2	2	2	-
<b>24ACSM6BT.2</b>	3	3	2	2	2	-	-	-	-	-	2	2	2	-
<b>24ACSM6BT.3</b>	3	3	3	3	2	-	-	-	-	-	2	3	2	-
<b>24ACSM6BT.4</b>	3	2	2	2	2	1	-	-	-	-	2	2	3	-
<b>24ACSM6BT.5</b>	3	3	3	2	3	2	-	-	-	-	3	3	3	-



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course : Big Data Analytics  
 Category : PE  
 Year : III  
 Semester : II  
 Course Code : 24AAID61T  
 Branch/es : AI&ML, AI&DS

Lecture Hours	Tutorial Hours	Practice Hours	Credits	Total Hours
3	0	0	3	52

### Course Objectives:

1. Understand the basic concepts and importance of Big Data
2. Understand the design concepts of HDFS
3. Provide good insight for developing a MapReduce application
4. Understand Hadoop environment
5. Explore the concepts of Pig, Hive, Spark and HBase

### Course Outcomes:

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

1. Understand the concepts and challenges of big data
2. Outline the operations viz. Collect, manage, store, query, and analyze various forms of big data.
3. Apply large-scale analytic tools to solve some of the open big data problems
4. Analyze the impact of big data for business decisions and strategies.
5. Design different big data applications.

### Unit 1 Introduction to Big Data 10

What is Big Data? Why Big Data is Important? Meet Hadoop, Data, Data Storage and Analysis, Comparison with other systems, History of Apache Hadoop, Hadoop Ecosystem, VMWare Installation of Hadoop. Analyzing the Data with Hadoop, Scaling.

### Unit 2 HDFS and MapReduce 10

HDFS: The Design of HDFS, HDFS Concepts, The Command-Line Interface, Hadoop File systems, The Java Interface, Data flow. MapReduce: Developing a MapReduce application, The Configuration API, Setting up the Development Environment, Running Locally on Test Data, Running on a Cluster

### Unit 3 MapReduce Types and Formats 10

How MapReduce Works: Anatomy of a MapReduce, Job Run, Failures, Shuffle and Sort, Task Execution. MapReduce Types and Formats: MapReduce Types, Input formats, output formats.

### Unit 4 Hadoop Environment 11

Hadoop Environment: Setting up a Hadoop Cluster, Cluster specification, Cluster Setup and Installation, Hadoop Configuration, Security. Pig: Installing and Running Pig, an Example, Comparison with Databases, Pig Latin, UserDefined Functions, Data Processing Operators.

### Unit 5 Hive, Spark, HBase 11

Hive: Installing Hive, Running Hive, Comparison with traditional Databases, HiveQL, Tables, Querying Data. Spark: Installing Spark, Resilient Distributed Datasets, Shared Variables, Anatomy of a Spark Job Run. HBase: HBasics, Installation, clients, Building an Online Query Application.

**Textbook:**

1. Tom White, "Hadoop: The Definitive Guide" Fourth Edition, O'Reilly Media, 2015

**Reference Books:**

1. Big Data, Big Analytics: Emerging business intelligence and analytic trends for today's businesses, Michael Minnelli, Michelle Chambers, and Ambiga Dhiraj, Wiley Co Series
2. Glenn J. Myatt, Making Sense of Data, John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O'Reilly, 2011
3. Michael Berthold, David J. Hand, Intelligent Data Analysis, Spingers, 2007
4. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGraw Hill Publishing, 2012

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24AAID61T.1	3	2	3	1	2	-	-	2	-	1	-	3	2	1
24AAID61T.2	3	2	2	2	2	-	-	2	-	1	-	3	3	2
24AAID61T.3	3	3	2	2	2	2	-	2	-	2	2	2	3	3
24AAID61T.4	3	2	2	3	2	2	-	2	-	2	2	3	3	2
24AAID61T.5	3	2	2	2	2	-	-	2	-	2	2	3	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

<b>Title of the Course:</b>	NATURAL LANGUAGE PROCESSING LAB		
<b>Category:</b>	PC		
<b>Year:</b>	III		
<b>Semester:</b>	II		
<b>Course Code:</b>	24ACSM62L		
<b>Branch/es:</b>	CSE, AI&ML, CSE(AI), CSE(AIML) & CSE (IoTCSBCT)		
<b>Lecture Hours</b>	<b>Tutorial Hours</b>	<b>Practice Hours</b>	<b>Credits</b>
0	0	3	1.5

### Course Objectives

1. Understand fundamental NLP techniques such as tokenization, stemming, lemmatization, and stopword removal using Python.
2. Apply syntactic and semantic analysis methods including POS tagging, chunking, and Named Entity Recognition.
3. Implement statistical NLP approaches such as n-grams, TF-IDF, and probabilistic language models.
4. Develop parsing and grammar-based models like CYK and chart parsing for sentence structure analysis.
5. Build real-world NLP applications such as sentiment analysis, spam detection, and fake news classification.

### Course Outcomes

1. Perform text preprocessing and normalization using various NLP techniques.
2. Analyze linguistic structures through POS tagging, chunking, and named entity recognition.
3. Apply statistical methods like TF-IDF and n-gram models for text representation and probability estimation.
4. Design and implement NLP-based models for parsing and information extraction tasks.
5. Develop practical NLP applications including sentiment analysis, spam filtering, and fake news detection using Python.

**Note: It is suggested for every student to complete all the experiments in the semester.**

- 1
  - a. Write a python program to perform tokenization by word and sentence using nltk.
  - b. Write a python program to eliminate stopwords using nltk.
  - c. Write a python program to perform stemming using nltk.
- 2
  - a. Write a python program to perform Parts of Speech tagging using nltk.
  - b. Write a python program to perform lemmatization using nltk.
- 3
  - a. Write a python program for chunking using nltk.
  - b. Write a python program to perform Named Entity Recognition using nltk.

- 4
  - a. Write a python program to find Term Frequency and Inverse Document Frequency (TF-IDF).
  - b. Write a python program for CYK parsing (Cocke- Younger-Kasami Parsing) or Chart Parsing.
- 5
  - a. Write a python program to find all unigrams, bigrams and trigrams present in the given corpus.
  - b. Write a python program to find the probability of the given statement “This is my cat” by taking the an exmple corpus into consideration.
- 6 Use the Stanford named Entity recognizer to extract entities from the documents. Use it programmatically and output for each document which named entities it contains and of which type.
- 7 Choose any corpus available on the internet freely. For the corpus, for each document, count how many times each stop word occurs and find out which are the most frequently occurring stop words. Further, calculate the term frequency and inverse document frequency as The motivation behind this is basically to find out how important a document is to a given query. For e.g.: If the query is say: “The brown crow”. “The” is less important. “Brown” and “crow” are relatively more important. Since “the” is a more common word, its tf will be high. Hence we multiply it by idf, by knowing how common it is to reduce its weight.
- 8 Write the python code to perform sentiment analysis using NLP
- 9 Write the python code to develop Spam Filter using NLP
- 10 Write the python code to detect Fake News using NLP
- 11 Write a python program to perform text preprocessing techniques such as tokenization, stop word removal, stemming, and lemmatization on a given text document.
- 12 Write a python program to implement Word Frequency Analysis and display the top most frequent words from a given corpus using nltk.
- 13 Write a python program to generate Word Cloud visualization for a given text corpus and analyze the important terms.
- 14 Write a python program to classify text documents using Machine Learning algorithms such as Naive Bayes or Logistic Regression with TF-IDF features.

#### **TEXTBOOKS:**

1. Speech and Language Processing – Daniel Jurafsky and James H. Martin, Pearson Education.
2. Natural Language Processing with Python – Steven Bird, Ewan Klein, Edward Loper, O’Reilly Media.

#### **REFERENCE BOOKS:**

1. Introduction to Natural Language Processing – Jacob Eisenstein, MIT Press.
2. Natural Language Processing with PyTorch – Delip Rao and Brian McMahan, O’Reilly.
3. Transformers for Natural Language Processing – Thushan Ganegedara, Packt Publishing.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSM62L.1	3	2	-	-	-	-	-	-	-	-	2	2	-	-
24ACSM62L.2	3	3	2	-	2	-	-	-	-	-	2	3	2	2
24ACSM62L.3	3	3	3	2	3	-	-	-	-	-	2	3	2	2
24ACSM62L.4	3	3	3	3	3	-	-	-	-	-	3	2	-	3
24ACSM62L.5	3	3	3	3	3	2	-	2	2	-	3	3	3	2



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

Title of the Course:	AI FOR CLOUD COMPUTING LAB
Category:	PC
Year	III
Semester:	II
Course Code:	24ACAI62L
Branch/es:	AI&ML, CSE(AI)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

**Course Objectives:** This course will be able to

1. To introduce the concepts, models, and services of cloud computing and its role in AI.
2. To explore the architecture and deployment of AI applications on cloud platforms.
3. To equip students with skills in using cloud-based tools and services for AI/ML workloads.
4. To understand data storage, processing, and security in cloud for AI tasks.
5. To apply cloud computing principles to real-world AI-based solutions.

**Course Outcomes:**

At the end of the course

1. Explain cloud computing architecture, services, and deployment models.
2. Utilize cloud platforms (AWS, GCP, Azure) for training and deploying AI models.
3. Handle large-scale data storage and processing in the cloud environment.
4. Integrate AI workflows using serverless and container-based architectures.
5. Analyze challenges in security, cost, scalability, and performance of cloud-based AI systems.

**Note: It is suggested for every student to complete all the experiments in the semester.**

## 1. Exploring Cloud Service Models (IaaS, PaaS, SaaS)

- a) Study IaaS, PaaS, SaaS models using AWS/Azure/GCP.
- b) Explore Public, Private, Hybrid, and Community cloud models.
- c) Deploy a basic cloud service or virtual machine.
- d) Compare cloud providers for AI applications.

## 2. AI Services in Cloud Platforms

- a) Explore NLP, Vision, and Analytics services in AWS/Azure/GCP.
- b) Test one AI cloud API service.
- c) Analyze benefits and challenges of AI-cloud integration.

## 3. Cloud Storage Services

- a) Manage objects in Amazon S3 and Azure Blob Storage.
- b) Query datasets using Google BigQuery.
- c) Compare storage performance and pricing.

## 4. Data Ingestion and Processing Pipelines

- a) Create a cloud-based data ingestion pipeline.
- b) Store and process data in cloud platforms.
- c) Generate analytics reports using Spark.

## **5. Distributed Computing using Hadoop and Spark**

- a) Setup Hadoop pseudo-distributed mode.
- b) Execute MapReduce and Spark jobs.
- c) Compare distributed and local processing performance.

## **6. Cost Optimization for Cloud Resources**

- a) Monitor compute/storage usage and billing.
- b) Apply cost optimization techniques.
- c) Analyze pricing for cloud services.

## **7. ML Model Training and Deployment using Cloud Services**

- a) Train ML models using SageMaker/Azure ML/Vertex AI.
- b) Deploy and test ML models in cloud platforms.
- c) Evaluate model performance.

## **8. AutoML and Notebook Integration**

- a) Train models using AutoML platforms.
- b) Integrate Jupyter/Colab with cloud storage.
- c) Compare AutoML and custom ML workflows.

## **9. Deep Learning using GPUs/TPUs**

- a) Train deep learning models using GPU/TPU acceleration.
- b) Compare CPU and GPU/TPU performance.
- c) Track experiments and results..

## **10. Containerization and Kubernetes Deployment**

- a) Create Docker containers for AI applications.
- b) Deploy applications using Kubernetes.
- c) Implement auto-scaling and monitoring.

## **11. Serverless Computing and CI/CD for AI Applications**

- a) Create serverless functions using AWS Lambda/Azure Functions.
- b) Integrate storage triggers and inference APIs.
- c) Build CI/CD pipelines for automated deployment.

3

## **12. IAM, Security, Ethics, and Case Study Implementation**

- a) Configure IAM users, roles, and policies.
- b) Implement cloud security and privacy controls.
- c) Study ethical issues in cloud AI systems.
- d) Develop and deploy a cloud-based AI mini project with monitoring and billing analysis.

### **Text Book:**

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, Mastering Cloud Computing, McGraw-Hill.

**Reference Books:**

1. Judith Hurwitz et al., Cloud Computing for Dummies, Wiley.
2. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and the world	Ethics	Individual and Collaborative Team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACAI62T.1	3	2	-	-	1	-	-	-	-	-	2	3	2	1
24ACAI62T.2	2	3	2	2	3	-	-	-	-	3	2	3	3	2
24ACAI62T.3	2	2	3	2	3	-	-	-	-	-	3	3	3	2
24ACAI62T.4	2	2	3	2	3	-	-	2	-	2	2	3	3	3
24ACAI62T.5	2	2	2	-	2	-	-	-	-	3	2	3	3	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT,  
(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamayya District, AP – 516126, INDIA

**Title of the Course:** Data Visualization Lab  
**Category:** PC  
**Year:** III  
**Semester:** II  
**Course Code:** 24ACSM61L  
**Branch/es:** CSE, AI&ML, CSE(AIML) & CSE (IoTCSBCT)

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	0	3	1.5

#### Course Objectives

1. To understand perceptron limitations and basic neural network learning.
2. To implement ANN and deep feed-forward networks using backpropagation.
3. To develop image classification models using deep neural networks.
4. To design CNN architectures with optimization, normalization, and regularization.
5. To evaluate model accuracy, epochs, and CPU–GPU performance with data augmentation.

#### Course Outcomes

1. Analyze perceptron behavior on linearly and non-linearly separable data.
2. Build and test ANN and deep feed-forward neural networks.
3. Implement image classification using neural networks and CNNs.
4. Apply padding, batch normalization, dropout, and regularization in CNN design.
5. Evaluate performance using accuracy, epochs, augmentation, and hardware comparison.

**Note: It is suggested for every student to complete all the experiments in the semester.**

- 1
  - a. Design a single unit perceptron for classification of a linearly separable binary dataset without using pre-defined models. Use the Perceptron() from sklearn.
  - b. Identify the problem with single unit Perceptron. Classify using Or-, And- and Xor-ed data and analyze the result.
- 2 Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets. Vary the activation functions used and compare the results.
- 3 Build a Deep Feed Forward ANN by implementing the Backpropagation algorithm and test the same using appropriate data sets. Use the number of hidden layers  $\geq 4$ .
- 4 Design and implement an Image classification model to classify a dataset of images using Deep Feed Forward NN. Record the accuracy corresponding to the number of epochs. Use the MNIST, CIFAR-10 datasets.
- 5 Design and implement a CNN model (with 2 layers of convolutions) to classify multi category image datasets. Record the accuracy corresponding to the number of epochs. Use the MNIST, CIFAR-10 datasets.

- 6 Design and implement a CNN model (with 4+ layers of convolutions) to classify multi category image datasets. Use the MNIST, Fashion MNIST, CIFAR-10 datasets. Set the No. of Epoch as 5, 10 and 20. Make the necessary changes whenever required. Record the accuracy corresponding to the number of epochs.  
Record the time required to run the program, using CPU as well as using GPU in Colab.
- 7 Design and implement a CNN model (with 2+ layers of convolutions) to classify multi category image datasets. Use the concept of padding and Batch Normalization while designing the CNN model. Record the accuracy corresponding to the number of epochs. Use the FashionMNIST/MNIST/CIFAR10 datasets.
- 8 Design and implement a CNN model (with 4+ layers of convolutions) to classify multi category image datasets. Use the concept of regularization and dropout while designing the CNN model. Use the Fashion MNIST datasets. Record the Training accuracy and Test accuracy corresponding to the following architectures:
  - a. Base Model
  - b. Model with L1 Regularization
  - c. Model with L2 Regularization
  - d. Model with Dropout
  - e. Model with both L2 (or L1) and Dropout
- 9 Use the concept of Data Augmentation to increase the data size from a single image.
- 10 Design and implement a CNN model to classify CIFAR10 image dataset. Use the concept of Data Augmentation while designing the CNN model. Record the accuracy corresponding to the number of epochs.
- 11 Design and implement a Multilayer Perceptron (MLP) model for classification of the Iris dataset. Compare the training and testing accuracy for different hidden layer sizes.
- 12 Implement an ANN model using different optimization algorithms such as SGD, Adam, and RMSProp. Compare their performance using suitable datasets.
- 13 Design and implement a CNN model to classify handwritten digit images using the MNIST dataset and display sample predictions with output labels.
- 14 Implement Transfer Learning using a pre-trained CNN model such as VGG16 or ResNet for image classification on a small custom dataset. Compare the accuracy before and after fine-tuning.

#### **TEXT BOOKS:**

1. Tamara Munzner, Visualization Analysis and Design, CRC Press, 2014.

#### **REFERENCE BOOKS**

1. Alberto Cairo, the truthful art: Data, charts, and Maps for communications, New Riders 2016
2. Cole Nussbaumer Knaflic, storytelling with Data :A Data visualization guide for Business Professionals.

### ONLINE LEARNING RESOURCES

1. NPTEL: Data Visualization - IIT Madras
2. Coursera: Data Visualization with Python by IBM

### CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and The world	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2	PSO3
24ACSM61L.1	3	3	1	2	2	-	-	-	-	-	2	3	2	-
24ACSM61L.2	3	3	2	2	3	-	-	-	-	-	2	3	3	-
24ACSM61L.3	3	3	3	2	3	-	-	-	-	-	2	3	3	-
24ACSM61L.4	3	3	3	3	3	-	-	-	-	-	2	3	3	-
24ACSM61L.5	3	3	3	3	3	-	-	-	-	-	2	3	3	-



**Unit 5 Corporate Etiquette**

9

Etiquette- Introduction, Concept, Significance - Corporate Etiquette - meaning, modern etiquette, benefits - Global and Local Culture Sensitivity - Gender Sensitivity - Etiquette in Interaction- Cell phone Etiquette - Dining Etiquette - Netiquette - Job Interview Etiquette - Corporate Grooming tips -Overcoming challenges.

MINIMUM REQUIREMENTS: Advanced English Language Communication Skills Lab

**Text Books:**

1. Mitra Barun K, Personality Development and Soft Skills, Oxford University Press, Pap/Cdr edition 2012
2. Dr Shikha Kapoor, Personality Development and Soft Skills: Preparing for Tomorrow, I K International Publishing House, 2018

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering tool usage	The engineer and society	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning
24AENG61.1	-	-	-	-	-	-	1	-	3	-	3
24AENG61.2	-	-	-	-	-	-	1	-	3	-	3
24AENG61.3	-	-	-	-	-	-	1	-	3	-	3
24AENG61.4	-	-	-	-	-	-	1	-	3	-	3
24AENG61.5	-	-	-	-	-	-	1	-	3	-	3



# ANNAMACHARYA UNIVERSITY

(ESTD UNDER AP PRIVATE UNIVERSITIES (ESTABLISHMENT AND REGULATION) ACT, 2016)

(UNIVERSITY LISTED IN UGC AS PER THE SECTION 2(f) OF THE UGC ACT, 1956)

RAJAMPET, Annamaya District, AP – 516126, INDIA

Title of the Course	Technical Paper Writing and Intellectual Property Rights
Category	MC
Year:	III
Semester:	II
Couse Code	24AMBA61T
Branch	EEE, ECE, CSE & CSE Allied Branches

Lecture Hours	Tutorial Hours	Practical	Credits	Total Hours
1	0	2	2	30

#### Course Objectives:

1. To enable the students to practice the basic skills of research paper writing.
2. To make the students understand the importance of IP and to educate them on the basic concepts of Intellectual Property Rights.
3. To practice the basic skills of performing quality literature review.
4. To help them in knowing the significance of real-life practice and procedure of Patents.
5. To enable them learn the procedure of obtaining Patents, Copyrights, & Trade Marks.

#### Course Outcomes: Student will be able to

1. Identify key secondary literature related to their proposed technical paper writing.
2. Explain various principles and styles in technical writing.
3. Use the acquired knowledge in writing a research/technical paper.
4. Analyze rights and responsibilities of holder of Patent, Copyright, Trademark, International Trademark etc.
5. Evaluate different forms of IPR available at national & international level and search of various forms of IPR by using modern tools and techniques.

#### **Unit 1 Principles of Technical Writing 6**

Principles of Technical Writing: styles in technical writing; clarity, precision, coherence and logical sequence in writing-avoiding ambiguity- repetition, and vague language -highlighting your findings-discussing your limitations -hedging and criticizing -plagiarism and paraphrasing.

#### **Unit 2 Research Paper Writing 6**

Technical Research Paper Writing: Abstract- Objectives-Limitations-Review of Literature- Problems and Framing Research Questions- Synopsis.

#### **Unit 3 Process of research 6**

Process of research: publication mechanism: types of journals- indexing-seminars- conferences-proof reading –plagiarism style; seminar & conference paper writing; Methodology-discussion-results- citation rules.

#### **Unit 4 Introduction to Intellectual property 6**

Introduction, types of intellectual property, International organizations, agencies and treaties, importance of intellectual property rights Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

**Unit 5 Fundamentals of copy right law**

6

Fundamentals of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law. Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer. Patent law, intellectual property audits.

**Text Book:**

1. Deborah. E. Bouchoux, Intellectual Property Rights, Cengage Learning India, 2013

**Reference Books:**

1. R.Myneni, Law of Intellectual Property, 9th Ed, Asia law House, 2019.
2. Prabuddha Ganguli, Intellectual Property Rights Tata McGraw Hill, 2001.

**CO-PO Mapping:**

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Engineering Tool usage	The Engineer and The World	Ethics	Individual and Collaborative team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
24AMBA61T-1	3	2	2	2	1	2	-	-	-	1	-	2	1
24AMBA61T-2	2	3	3	2	2	1	-	-	-	-	-	2	2
24AMBA61T-3	3	2	3	2	2	1	1	-	-	-	-	1	1
24AMBA61T-4	2	3	2	2	2	1	1	-	-	-	-	1	2
24AMBA61T-5	2	2	2	1	3	1	1	-	-	1	1	1	2