SEMESTER V

S. No	Category	Course Code	Course Title	L	T	P	C
Theory							
1	PC	CS23501	Theory of Computation	3	1	0	4
2	PC	CS23502	Data Warehousing and Data Mining	3	0	0	3
3	PC	CS23503	Artificial Intelligence	3	0	0	3
4	PC	CS23504	Software Engineering	3	0	0	3
5	PC	CS23505	Foundation of Data science	3	0	0	3
6	PE	CS2315*	Professional Elective – I	3	0	0	3
Practical							
7	PC	CS23506	Data Warehousing and Data Mining laboratory	0	0	2	1
8	PC	CS23507	Artificial Intelligence laboratory	0	0	4	2
9	EE	EE23502	Industrial Training *	0	0	2	1
10	EE	GE23501	Professional Development III	0	0	2	1
			Total	**18**	**1**	**10**	**24**

- Two weeks during Summer Vacation

SEMESTER VI

S. No	Category	Course Code	Course Title	L	T	P	C
Theory							
1	HS	BA23***	Entrepreneurship Development	3	0	0	3
2	PC	CS23601	Cryptography and Network Security	3	0	0	3
3	PC	CS23602	Big Data Analytics	3	0	0	3
4	PC	CS23603	Machine Learning	3	0	0	3
5	PE	CS2325*	Professional Elective – II	3	0	0	3
6	OE	CS2390*	Open Elective – I	3	0	0	3
Practical							
7	PC	CS23604	Big Data Analytics laboratory	0	0	4	2
8	PC	CS23605	Machine Learning Laboratory	0	0	4	2
9	EE	EE23601	Design Thinking	0	0	2	1
			Total	**18**	**0**	**10**	**23**

CS33501	THEORY OF COMPUTATION	3	0	0	3

COURSE OBJECTIVES

To enable the students to

1	understand the need for automata theory in computation.
2	analyze and construct finite automata and regular expressions for regular languages.
3	develop and simplify context-free grammars and analyze their ambiguity.
4	design pushdown automata and establish equivalence with CFGs.
5	understand the Turing machine model and the fundamentals of computational complexity.

UNIT I	INTRODUCTION TO AUTOMATA	9

Need for automata theory - Introduction to formal proof – Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Equivalence between NFA and DFA – Conversion from NFA to DFA.

UNIT II	REGULAR EXPRESSIONS AND LANGUAGES	9

Regular expression – Regular Languages- Equivalence of Finite Automata and regular expressions – Proving languages to be not regular (Pumping Lemma) – Closure properties of regular languages.

UNIT III	CONTEXT FREE GARMMAR	9

Context-Free Grammar (CFG) – Definitions – Derivations and Parse trees – Ambiguity in grammars and languages – Chomsky Normal Form (CNF) – Pumping lemma for CFL – Closure properties of Context Free Languages

UNIT IV	PUSH DOWN AUTOMATA	9

Push Down Automata (PDA): Definition – Moves - Instantaneous descriptions -Languages of pushdown automata – Equivalence of pushdown automata and CFG-Conversion of CFG to PDA-PDA to CFG – Deterministic Pushdown Automata

UNIT V	TURING MACHINES AND UNDECIDABILITY	9

Turing Machine: Basic model – Language acceptance by TM – Universal Turing Machine – Unsolvable Problems – Post Correspondence Problem(PCP) – Tractable and Intractable problems - P and NP completeness – 3-CNF SAT problems.

	TOTAL PERIODS	45

COURSE OUTCOMES

At the end of the course, the students will be able to		BT MAPPED (Highest Level)
CO1	construct finite automata and explain their significance in automata theory.	Understanding (K2)

CO2	write regular expressions and apply techniques to identify non-regular languages.	Analyzing (K4)
CO3	design and simplify context-free grammars and analyze ambiguity in language definitions	Applying (K3)
CO4	design pushdown automata and demonstrate equivalence with context-free grammars.	Applying (K3)
CO5	understand the Turing machine model and analyze decidability and complexity concepts.	Analyzing (K4)

TEXT BOOKS

1. J.E.Hopcroft, R.Motwani and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Third Edition, Pearson Education, 2006.
2. John C Martin , "Introduction to Languages and the Theory of Computation", 4th Edition, Tata McGraw Hill, 2011.

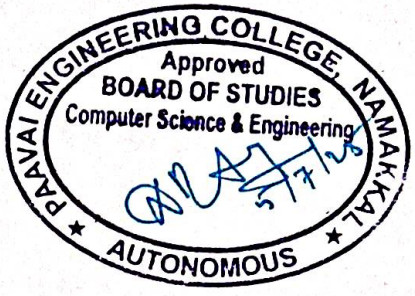
REFERENCES

1. Harry R Lewis and Christos H Papadimitriou , "Elements of the Theory of Computation", 2nd Edition, Prentice Hall of India, 2015.
2. Peter Linz, "An Introduction to Formal Language and Automata", 6th Edition, Jones & Bartlett, 2016.
3. K.L.P.Mishra and N.Chandrasekaran, "Theory of Computer Science: Automata Languages and Computation", 3rd Edition, Prentice Hall of India, 2006.
4. Michael Sipser, " Introduction to the Theory of Computation", 3rd edition, Cengage Publications.

CO-POMAPPING:

Mapping of Course Outcomes with Programme Outcomes :
(1,2,3 indicates the strength of correlation) 3 – Strong , 2 – Medium , 1 – Weak

COs	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO12	PSO 1	PSO 2
CO1	3	2	2	-	-	-	-	-	-	-	-	-	3	2
CO2	3	3	3	1	-	-	-	-	-	-	-	-	3	3
CO3	3	2	3	-	-	-	-	-	-	-	-	-	3	2
CO4	3	3	3	-	-	-	-	-	-	-	-	-	3	3
CO5	3	3	2	2	-	-	-	-	-	-	-	-	3	3



CS23502	DATA WAREHOUSING AND DATA MINING	3	0	0	3

COURSE OBJECTIVES

To enable the students to

1.	Understand the fundamental concepts of Data Warehousing and OLAP technologies
2.	To know about the basics of data mining and application of datamining techniques
3.	Analyze and explore association rule mining techniques
4.	Study various classification techniques in datamining.
5.	Learn different clustering methods and advanced clustering techniques

UNIT I **DATA WAREHOUSE AND OLAP TECHNOLOY** 9

Data Warehouse- Basic concepts of data warehousing, data warehouse Architecture; Data warehouse modeling: schema and measures; OLAP operations-Typical OLAP operations, Indexing OLAP data: bitmap index and join index, Storage implementation: column-based databases; Data cube computation; Data cube computation methods.

UNIT II **DATA MINING AND PREPROCESSING** 9

Introduction - Data Mining, Diversity of data types for data mining, Mining various kinds of knowledge, confluence of multiple disciplines, Application; Data types; Data Preprocessing- Data quality, Data Cleaning, Data Integration; Data Transformation; Dimensionality reduction.

UNIT III **PATTERN MINING** 9

Basic concepts - Market Basket Analysis, Frequent Itemset, Closed Itemset, and Association Rules; Frequent Item set mining methods; Pattern Evaluation Methods; Kinds of patterns; Constraint-based pattern mining; Pattern mining- application examples.

UNIT IV **CLASSIFICATION** 9

Basic Concepts- Decision tree Induction, Bayes Classification Methods, Lazy learners; Advanced Classification methods-Bayesian Belief Networks, Support vector machines, Rule-based and pattern-based classification, Classification with weak supervision Other.

UNIT V **CLUSTERING AND DATA MINING APPLICATIONS** 9

Cluster Analysis; Partitioning methods; Hierarchical methods; Density-based and grid-based methods; Outlier Detection- Clustering- vs. classification-based approaches; Data mining trends and research frontiers-Mining rich data types, Datamining applications.

TOTAL PERIODS 45

COURSE OUTCOMES		
At the end of this course, students will be able to		**BT Mapped (Highest Level)**
CO1	Understand the architecture, components, and models of data warehouses and OLAP technologies.	Understand (K2)
CO2	Apply preprocessing techniques to prepare raw data for mining	Apply (K3)
CO3	Analyze various association rule mining methods and discover patterns in large datasets.	Analyze (K4)
CO4	Compare and apply classification techniques to categorize data effectively.	Analyze (K4)
CO5	Evaluate clustering methods and interpret the application of data mining techniques in real-world scenarios.	Analyze(K4)

TEXT BOOKS

1. Jiawei Han, Jian Pei, Hanghang Tong, "Data Mining: Concepts and Techniques", 4th Edition, Morgan Kaufmann, 2023.
2. Alex Berson and Stephen J.Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw - Hill Edition, 35th Reprint 2016.

REFERENCES

1. Ralph Kimball & Margy Ross," The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling, Wiley, 2013.
2. Lawrence Corr & Jim Stagnitto, "Agile Data Warehouse Design: A Practical Guide for Building Dimensional Data Warehouses", Technics Publications, 2017.
3. Pang-Ning Tan, Michael Steinbach, Anuj Karpatne & Vipin Kumar"Introduction to Data Data Mining,2017 .
4. David Hand, Heikki Manila and Padhraic Symth, "Principles of Data Mining", PHI, 2004.

CO-PO MAPPING:

Mapping of Course Outcome (CO's) with Programme Outcomes (PO's) and Programme Specific Outcomes PSO's (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

	Programme Outcomes PO's												PSO's	
CO's	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	2	-	2	-	-	-	-	1	-	2	3	2
CO2	2	3	2	-	3	-	-	-	-	-	-	2	3	3
CO3	3	3	3	2	3	-	-	1	-	2	1	3	3	3
CO4	3	3	3	2	3	-	-	-	2	2	2	3	3	3
CO5	2	3	2	3	3	1	-	2	2	2	2	3	3	3

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CS23503	ARTIFICIAL INTELLIGENCE	3	0	0	3

(Common to CSE, IT, CSE(IoT))

COURSE OBJECTIVES

To enable the students to

1	Acquire a knowledge of various methods of different problem solving and searching techniques
2	understand the concepts of knowledge representation
3	understand about knowledge inference and how to solve the problems using various inference techniques
4	realize the concepts of planning and expert system
5	understand the method of various AI Applications

UNIT I	INTRODUCTION TO AI	9

AI Problems: Problem Definition – Problem Characteristics – Production System Characteristics – Problem Solving Methods - Issues in the design of search programs – Intelligent Agents – Searching Strategies – Heuristics Search – Search Techniques

UNIT II	KNOWLEDGWE RESPRESENTATION	9

Predicate Logic – Representing knowledge using rules – Symbolic Reasoning – Statistical Reasoning – Representing knowledge using Frames – Scripts – Knowledge Engineering in First Order Logic

UNIT III	KNOWLEDGE INFERENCE	9

Inference in First Order Logic and Proportional Logic: Unification and Lifting – Forward Chaining – Backward Chaining – Resolutions – Reasoning: Probabilistic Reasoning – Bayes Networks – Hidden Markov Models – Dynamic Bayesian Networks

UNIT IV	PLANNING AND EXPERT SYSTEM	9

Components of a Planning System – Hierarchical Planning – Reactive Systems – Other Planning Techniques – Expert System: Architecture of Expert System – Roles of Expert System – Knowledge Acquisition – Expert System Applications: Medical Diagnosis Systems – Financial, Analysis Tools and Manufacturing Process Optimizer

UNIT V	AI APPLICATIONS	9

Language Models – Information Retrieval – Information Extraction – Natural Language Processing – Robots: Hardware – Perception – Planning - Moving

	TOTAL PERIODS	45

COURSE OUTCOMES		
At the end of this course, students will be able to		**BT Mapped (Highest Level)**
CO1	demonstrate awareness of intelligent agents and problem solving using search methods	Applying (K3)
CO2	develop and analyze the knowledge about the usage of predicate logic and first order logic for making inferences	Analyzing (K4)
CO3	use the knowledge and the process of inference to derive new facts	Analyzing (K4)
CO4	Get the development ideas of planning system and expert system by using applications	Applying (K3)
CO5	apply knowledge of language models and know the ideas about the robot	Applying (K3)

TEXT BOOKS

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 3rd Edition, Pearson Education / Prentice Hall of India, 2010.
2. Elaine Rich, Kevin Knight, Shivashankar.B.Nair, "Artificial Intelligence", Tata Mc Graw Hill Publishing Company Limited. Third Edition, 2009

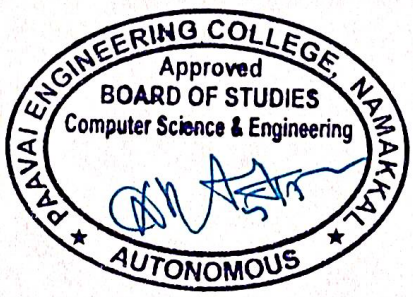
REFERENCES

1. Lavika Goel, "Artificial Intelligence Concepts and Applications", Wiley Publications, 2021.
2. Dan W. Patterson, "Introduction to AI and ES", Pearson Education Publications, 2015.
3. Deepak Khemani, "Artificial Intelligence", Tata McGraw Hill Education Publications, 2013.
4. Tom M. Mitchell, "Machine learning", Tata McGraw Hill Education Publications, 2017.

CO-PO MAPPING:

Mapping of Course Outcome (CO's) with Programme Outcomes (PO's) and Programme Specific Outcomes PSO's
(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

	Programme Outcomes PO's												**PSO's**	
CO's	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO1	3	3	3	3	2	2	-	3	-	-	-	3	3	3
CO2	3	3	3	3	2	2	-	3	-	-	-	3	3	3
CO3	3	3	3	3	2	2	-	3	-	-	-	3	3	3
CO4	3	3	3	3	2	3	-	3	-	-	-	3	3	3
CO5	3	3	3	3	2	3	-	3	-	-	-	3	3	3



CS23504	SOFTWARE ENGINEERING	3	0	0	3

COURSE OBJECTIVES

To enable the students to

1	Introduce the fundamental concepts of software engineering and software process models.
2	Apply the methods for modeling software requirements through scenarios, classes, and behaviors, focusing on web apps.
3	Analyze the software design principles, architectural styles, and data flow mapping for effective software architecture.
4	Apply software testing strategies, methodologies, and techniques for conventional, object-oriented, and web applications.
5	Analyze the key concepts of software project management, metrics, and estimation.

UNIT I	INTRODUCTION TO SOFTWARE ENGINEERING	9

Software and Software Engineering - The Nature of software, The Unique Nature of WebApps, Software Engineering, The Software Process, Software Engineering Practice, Software Myths; Process Models – A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Technology, Product and Process.

UNIT II	REQUIREMENTS MODELING	9

Requirements Modeling: Scenarios, Information and Analysis Classes - Requirements Analysis, Scenario-Based Modeling, UML Models That Supplement the Use Case, Data Modeling Concepts, Class-Based Modeling; Requirements Modeling: Flow, Behavior, Patterns , WebApps – Requirements Modeling Strategies, Flow-Oriented Modeling, Creating a Behavioral Model, Patterns for Requirements Modeling, Requirements Modeling for WebApps.

UNIT III	DESIGN CONCEPTS	9

Design Concepts – Design within the Context of Software Engineering, The Design Process, Design Concepts, Design Model; Architectural Design – Software Architecture, Architectural Genres, Architectural Styles, Architectural Design, Assessing Alternative Architectural Designs, Architectural Mapping using Data Flow.

UNIT IV	SOFTWARE TESTING STRATEGIES	9

Software Testing Strategies – A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Test Strategies for Object-Oriented Software, Test Strategies for WebApps, Validation Testing, System Testing, The Art of Debugging; Testing Conventional Applications – Software Testing Fundamentals, Internal and External Views of Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Model-Based Testing.

UNIT V	PROJECT MANAGEMENT AND METRICES	9

Project Management Concepts – The Management Spectrum, People, The Product, The Process, The Project, The W^5HH Principle; Process and Project Metrics – Metrics in the Process and Project Domains, Software Measurement, Metrics for Software Quality; Estimation for Software Projects – Observations on Estimation, The Project Planning Process, Software Scope and Feasibility, Resources, Software Project Estimation, Empirical Estimation Models.

	TOTAL PERIODS	**45**

COURSE OUTCOMES

At the end of the course, the students will be able to		BT MAPPED (Highest Level)
CO1	Understand basic software engineering principles and apply suitable process models in software development.	Understanding (K2)
CO2	Apply modeling techniques for requirements analysis, including flow, behavior, class-based models.	Applying (K3)
CO3	Analyse the concepts and architectural styles to evaluate and map software architectures.	Analyzing (K4)
CO4	Apply various testing strategies, including white-box and black-box testing, to validate and debug different types of software applications.	Applying (K3)
CO5	Analyze the project management, metrics, estimation methods in software projects.	Analyzing (K4)

TEXT BOOKS

1. Roger S. Pressman, "Software Engineering – A practitioner's Approach", Sixth Edition, McGraw-Hill International Edition, 2005
2. Ian Sommerville, "Software engineering", Seventh Edition, Pearson Education Asia, 2007.

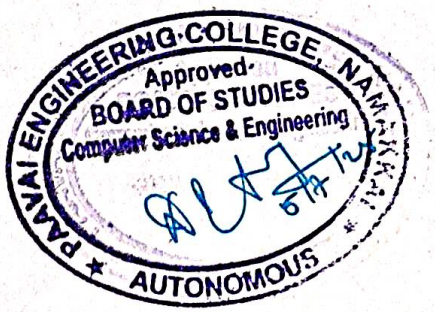
REFERENCES

1. Rajib Mall, "Fundamentals of Software Engineering", Third Edition, PHI Learning Private Limited, 2009.
2. PankajJalote, "Software Engineering", A Precise Approach, Wiley India, 2010.
3. Kelkar S.A., "Software Engineering", Prentice Hall of India Pvt Ltd, 2007.
4. Stephen R.Schach, "Software Engineering", Tata McGraw-Hill Publishing Company Limited,2007.

CO-POMAPPING:

Mapping of Course Outcomes with Programme Outcomes:
(1,2,3 indicates the strength of correlation) 3 – Strong, 2 – Medium, 1 – Weak

COs	Program Outcomes (Pose)												Programme Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	2	1	1	-	-	-	-	1	2	2	1	1
CO2	1	2	1	3	1	-	-	-	-	2	2	1	1	2
CO3	1	1	2	2	3	-	-	-	-	1	1	3	1	1
CO4	3	1	2	1	1	-	-	-	-	2	3	2	2	1
CO5	3	1	2	1	2	-	-	-	-	1	3	2	1	1



CS233505	FOUNDATIONS OF DATA SCIENCE	3	0	0	3

COURSE OBJECTIVES

To enable the students to

1	understand the data science fundamentals and its process.
2	describe the data for building the model along and statistical basis for AI.
3	analyses the relationship between data using predictive model evaluation.
4	utilize the Python libraries for Data Wrangling.
5	present and interpret data using visualization libraries in Python.

UNIT I	INTRODUCTION	9

Data Science: Benefits and uses – facets of data - Data Science Process: Overview – Defining research goals – Retrieving data – Data preparation - Exploratory Data analysis – build the model– presenting findings and building applications.

UNIT II	DESCRIBING DATA	9

Types of Data - Types of Variables - Basic Statistical descriptions of Data - Describing Data with Tables and Graphs –Describing Data with Averages - Describing Variability - Normal Distributions and Standard (z) Scores.

UNIT III	DESCRIBING RELATIONSHIPS	9

Correlation –Scatter plots –correlation coefficient for quantitative data –computational formula for correlation coefficient – Regression –regression line –least squares regression line – Standard error of estimate – interpretation of r2 –multiple regression equations –regression towards the mean.

UNIT IV	PYTHON LIBRARIES FOR DATA WRANGLING	9

Basics of Numpy arrays –aggregations –computations on arrays –comparisons, masks, boolean logic – fancy indexing – structured arrays – Data manipulation with Pandas – data indexing and selection – operating on data – missing data – Hierarchical indexing – combining datasets – aggregation and grouping – pivot tables.

UNIT V	DATA VISUALIZATION	9

Importing Matplotlib – Line plots – Scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization – three dimensional plotting - Geographic Data with Basemap - Visualization with Seaborn.

	TOTAL PERIODS	45

COURSE OUTCOMES

At the end of the course, the students will be able to		BT MAPPED (Highest Level)
CO1	Define the data science process	Understanding (K2)
CO2	Understand different types of data description for data science process	Analyzing (K4)
CO3	Gain knowledge on relationships between data	Applying (K3)
CO4	Use the Python Libraries for Data Wrangling	Applying (K3)

CO5	Apply visualization Libraries in Python to interpret and explore data	Analyzing (K4)

TEXT BOOKS

1. David Cielen, Arno D. B. Meysman, and Mohamed Ali, "Introducing Data Science", Manning Publications 2016.(Unit - I)
2. Robert S. Witte and John S. Witte, "Statistics", Eleventh Edition, Wiley Publications, 2017.(Unit – II & III)
3. Jake VanderPlas, "Python Data Science Handbook", O'Reilly, 2016. (Unit – V)

REFERENCES

1. Auerlien Geron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd or 3rd Edition, O'Reilly Media.
2. Allen B. Downey, "Think Stats: Exploratory Data Analysis in Python", Green Tea Press,2014.
3. Avrim Blum, John Hopcroft, Ravindran Kannan, "Foundations of Data Science", Cambridge Press, 2020.
4. Brennan Davis, Hunter Glanz, "Data Science for all", 1st Edition,Pearson Publication, 2024.

CO-POMAPPING:

Mapping of Course Outcome (CO's) with Programme Outcomes (PO's) and Programme Specific Outcomes PSO's
(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)	
	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO12	PSO1	PSO2
CO1	2	2	1	2	2	-	-	-	1	1	1	2	2	2
CO2	2	1	-	1	1	-	-	-	2	1	1	2	2	3
CO3	2	2	1	2	2	1	1	-	1	2	1	3	2	2
CO4	3	2	2	1	1	-	-	-	1	1	2	2	3	3
CO5	2	2	1	2	2	1	1	-	1	1	1	2	2	2

CS23506	DATA WAREHOUSING AND DATA MINING LABORATORY	0	0	2	1

COURSE OBJECTIVES

To enable the students to

1.	To implement the concepts of data warehousing, OLAP, and data mining through practical exercises.
2.	To perform data preprocessing, transformation, and analysis on real datasets.
3.	To apply mining techniques such as classification, clustering, and association rule mining.
4.	To use data mining tools such as Weka, RapidMiner, R, Python (Scikit-learn, Pandas), or SQL-based OLAP tools.

LIST OF EXPERIMENTS

1. Explore WEKA
2. Perform data preprocessing tasks
3. Demonstrate performing association rule mining on data sets
4. Implement the FP-Growth algorithm.
5. Demonstrate performing classification on data sets
6. Demonstrate performing clustering on data sets
7. Demonstrate performing Regression on data sets.
8. Credit Risk Assessment. Sample Programs using German Credit Data
9. Implement Apriori approach

TOTAL PERIODS	**30**

COURSE OUTCOMES At the end of this course, the students will be able to		**BT MAPPED** (Highest Level)
CO1	Use data mining tools like WEKA, Python, or R to explore datasets and perform basic operations.	Applying (K3)
CO2	Apply data preprocessing techniques such as cleaning, transformation, and normalization to real-world datasets.	Applying (K3)
CO3	Implement and analyze association rule mining techniques including Apriori and FP-Growth algorithms.	Analyzing(K4)
CO4	Apply classification and clustering algorithms to discover patterns in datasets.	Analyzing(K4)

CO PO MAPPING:

Mapping of Course Outcome (CO's) with Programme Outcomes (PO's) and Programme Specific Outcomes (PSO's)
(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	2	1	3	-	-	-	-	2	2	2	3	3
CO2	2	3	2	-	3	-	-	-	-	2	-	2	3	3
CO3	3	3	2	2	3	-	-	-	-	2	1	2	3	3
CO4	3	2	3	2	3	-	-	-	-	2	2	2	3	3

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CS23507	ARTIFICIAL INTELLIGENCE LABORATORY	0	0	4	2

COURSE OBJECTIVES

To enable the students to

1	apply knowledge of various methods of different problem solving and searching techniques
2	understand the concepts of knowledge representation
3	implement unification and classification planning algorithm
4	develop systems with logical reasoning
5	develop systems with probabilistic reasoning

LIST OF EXPERIMENTS:

1. Implement basic search strategies - 8-puzzle problem
2. Implement basic search strategies - crypt arithmetic problem
3. Implement BFS and DFS for water jug problem
4. Implement a* and memory bounded a* search
5. Implement unification algorithm using python
6. Implement classical planning algorithm
7. Implement forward chaining and backward chaining using python
8. Implement Mini max algorithm for game playing (Alpha-Beta pruning)
9. Solve constraint satisfaction problems
10. Case Studies on NLP

COURSE OUTCOMES	TOTAL PERIODS	60
At the end of this course, students will be able to		BT Mapped (Highest Level)
CO1:Design and implement search strategies		APPLYING(K3)
CO2: Understanding the knowledge about the usage of predicate logic and first order logic for making inferences		APPLYING(K3)
CO3:Develop logic reasoning systems		APPLYING(K3)
CO4:Develop probabilistic reasoning systems		APPLYING(K3)

CO's-PO's &PSO's MAPPING

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	3	2	-	-	-	-	-	1	2	1	3	2	1
2	3	3	3	3						3	2	3	3	3	2
3	3	3	3	3						1	3	1	1	1	3
4	3	3	3	2						2	3	1	2	2	1
5	3	3	3	2						1	3	3	3	2	1
AVG	3	3	3	3						1	3	3	3	2	1

1-Low,2-Medium,3-High,'-' – No Correlation

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GE23501	PROFESSIONAL DEVELOPMENT III	0	0	2	1

COURSE OBJECTIVES

To enable students to

- enhance their Resume writing skills and improving corporate vocabularies to survive in the corporate world.
- evaluate their interview skills and improve their interview presentation.
- solve the quantitative aptitude problems and improve their mental ability.
- improve the critical thinking and reasoning skills.

UNIT I	RESUME WRITING SKILLS	6

Updated Resume Building III – Self Introduction III – Dressing Etiquette – JAM V – Corporate Vocabulary

UNIT II	INTERVIEW SKILLS	6

Interview skills – General guidelines - Work Ethics – Group Discussion III – JAM VI – Presentation Competence – Mock Interview

UNIT III	QUANTITATIVE APTITUDE	9

Cube Root and Square Root - Time and Work - Ages - Permutation and Combination - Probability - Calendar

UNIT IV	LOGICAL REASONING	9

Series Completion - Blood Relations - Coding and Decoding - Data Sufficiency - Statements and Assumptions

TOTAL PERIODS: 30

COURSE OUTCOMES Upon completion of the course, the students will be able to		BT MAPPED (Highest Level)
CO1	• excel in drafting Resumes and speaking.	Create (K6)
CO2	• demonstrate the participative skills in group discussions and Interviews.	Applying (K3)
CO3	• solve problems based on quantitative aptitude.	Applying (K3)
CO4	• enhance their logical and verbal reasoning.	Analyzing (K4)

TEXTBOOKS

1. Aggarwal, R. S. A Modern Approach to Verbal & Non-Verbal Reasoning. Revised ed., 2024–25, S. Chand & Company Ltd., 2024.
2. Aggarwal, R. S. Objective General English: Fully Revised Video Edition. S. Chand & Company Ltd., 2022.

REFERENCES

1. Abhijit Guha, "Quantitative Aptitude ", Tata-Mcgraw Hil1.2015.
2. Word Power Made Easy By Norman Lewis, Wr.Goyal Publications.2016.
3. Johnson, D.W. Reaching out — Interpersonal Effectiveness and self- actualisation. Boston: Allyn and Bacon.2019.
4. Infosys Campus Connect Program — students' guide for soft skills.2015.

CO/PO MAPPING:

Mapping of Course Outcome (CO's) with Programme Outcomes (PO's)
(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

CO's	Programme Outcomes (PO's)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
CO1	3	2	2	3	3	1	-	-	-	-	-	-	3	2
CO2	-	2	3	-	2	-	2	-	-	-	-	-	3	2
CO3	3	2	2	2	-	-	1	-	-	-	-	-	2	3
CO4	3	2	2	-	-	1	-	-	-	-	2	-	2	3

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