



YEAR – WISE AND SEMESTER WISE DISTRIBUTION OF SUBJECTS

SCHOOL OF INFORMATICS

B. SC. COMPUTER SCIENCE & MACHINE LEARNING

THIRD SEMESTER, ACADEMIC YEAR 2024 – 25 OF 2023 – 26 BATCH (CBCS)

Sl. No.	Part	Subject code	Title of the Subject	Hour/ Week	Duration of the semester Exams	Marks			Credits
						Internal	External	Total	
THEORY									
1.	I	ES23301	Environmental Studies and Gender Sensitization (AECC – 5)	3	3	40	60	100	3
2.	II	G24CSML1T	ML for Everyone (GE (ID) -1)	2	3	40	60	100	2
3.	II	CSML24302	DBMS (Core – 7)	4	3	40	60	100	4
4.	II	BS18335	Discrete Mathematics (Core – 8)	5	3	40	60	100	4
5.	II	CSML24303	Digital Logic and Design (Core – 9)	4	3	40	60	100	4
6.	II	CSML24304	Introduction to AI (Core – 10)	4	3	40	60	100	4
PRACTICALS									
7.	II	G24CSML1P	ML for Everyone Practical's (GE (ID) -1)	2	3	40	60	100	1
8.	II	CSML24306	DBMS Practical's (Core – 7)	2	3	40	60	100	1
9.	II	CSML24307	Digital Logic and Design Practical's (Core – 9)	2	3	40	60	100	1
10.	II	CSML24308	Introduction to AI Practical's (Core – 10)	2	3	40	60	100	1
	Total			30	-	400	600	1000	25

*Ability Enhancement Compulsory Course (AECC)



GENERIC ELECTIVE (A.Y. 2024 – 25)
(INTER – DEPARTMENTAL/ INTER – DISCIPLINARY)
UG COURSES

S. No.	Name of the Department	GE Course Name
1.	B. Sc. Chemical Technology	Solar Processing Techniques
2.	B. Sc. (Hons) Agriculture	Principles of Organic Farming
3.	B. Sc. Computer Science & Engineering	PC Operating Systems
4.	B. Com. Honours	Taxation
5.	B. Sc. Computer Systems & Engineering	PC Hardware and Software installation
6.	B. Com. Marketing	Principles of Marketing
7.	B. Sc. Biotechnology, Chemistry & Genetics	Medical Lab Technology
8.	B. A. Mass Communication	Film Appreciation
		Photography
9.	B. Sc. Food Technology & Management	Food Processing & Quality Control
10.	B. A. Psychology, English & Journalism	Communication Skills
		Career Skills
		Psychology for living
11.	B. Sc. Mathematics, Statistics & Computer Science	Quantitative Aptitude
		Statistics - Data Analysis
12.	B. Sc. Multimedia and Animation	Creative Arts
13.	B. Com. Computer Applications	Accounting
14.	B. B.A. (Bachelor of Business Administration)	Principles of Management
15.	B. Com. International Finance	Project Management
16.	B. Sc. Computer Data Science & Data analytics Engg.	Python Programming
17.	B. Com. (Hons) Strategic Finance	Goods & Service Tax
18.	B. Com. Business Process Management	Financial Markets
19.	B. Sc. Food Science, Nutrition and Dietetics	Principles of Nutrition and Dietetics
20.	B. Co. Business Studies	Banking
21.	B. Sc. Computer Science & Cognitive Systems	Introduction to worksheets
22.	B. Com. Business Analytics	Principles of Insurance
23.	B. Sc. Computer Science & Artificial Intelligence	LISP programming
24.	B. Sc. Computer Science & Cyber Security	Principles of Information Security
25.	B. A. Economics, Public Administration & Computer Science	Human Rights
26.	B. Com. Information Systems	Human Resource Management
27.	B. Sc. Computer Science & Cloud Computing	Web Programming
28.	B. Sc. Computer Science & IOT	Introduction to IOT using Arudino
29.	B.B.A. Entrepreneurship Development	Startup Management
30.	B. B. A. Retail Operations Management	Consumer Behavior
31.	B. Sc. Computer Science & Machine Learning	ML for everyone
32.	B. B.A Tourism	Tourism Management



ENVIRONMENTAL STUDIES AND GENDER SENSITIZATION

(AECC – 5)

Credits : 3

Semester: III

Subject Code: ES23301

No. of Lecture hours: 45

Objectives:

- To understand the importance of ecological balance for Sustainable Development
- To understand the impacts of developmental activities and mitigation measures
- To understand the environmental policies and regulations.
- To develop students' sensibility with regard to issues of gender in contemporary India
- To provide a perspective on the socialization of men and women
- To expose the students to debate on the politics and economic works and on gender violence.

Outcome:

- Students will gain knowledge on environmental aspects and involve themselves in acquiring a sustainable environment.
- Students will be sensitized towards gender issues in the society and the laws enforced for their protection.

Course Outcomes:

CO 1: Understand the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity.

CO 2: Understand pollution problems and apply environmental science knowledge on solid waste management, disaster management.

CO 3: Apply the environmental science knowledge to improve the resources Evaluate and understand the sustainable environmental conditions and control methods.

CO 4: Identify the interactions and inter sections of identities (e.g., gender, race, ethnicity class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems

CO 5: Understand gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislation.

UNIT – I

9 Hrs

NATURAL RESOURCES, ECOSYSTEM AND BIODIVERSITY

Definition, scope, and importance of environmental studies.

Need for public awareness.

Renewable and non – renewable resources, brief account on forests, water, minerals, and energy (solar, wind and geo – thermal and bio – energy).



Definition of Ecosystem, structure, and decomposers. Energy flow and example ecosystems – Forest, Desert, aquatic ecosystems.

Definition of biodiversity, types (Genetic, Species, Ecosystem), India Mega diversity Nation.

Hotspots, threats to biodiversity, conservation of biodiversity (In – Situ and Ex – Situ).

UNIT – II

9 Hrs

ENVIRONMENTAL POLLUTION

- Definition of environmental pollution.
- Brief account on causes, effects, prevention and control measures of
 - a) Air pollution
 - b) Water pollution
 - c) Soil pollution
 - d) Noise pollution
 - e) Marine pollution
- Solid Waste management: Causes, effects, and control measures of urban industrial wastes.
- Disaster Management: floods, earthquakes, and cyclones.

UNIT – III

9 Hrs

SOCIAL ISSUES AND ENVIRONMENT

- Rainwater harvesting, water shed management, and from unsustainable to sustainable development.
- Global warning, ozone depletion, and acid rain.
- Environmental Legislation: Air Act, Water Act, Environmental Protection Act, Forest Act, Wildlife Act.
- Environmental and human health – HIV/ AIDS
- Welfare Programs – Family, Women & child welfare, population explosion.
- Role of information Technology in environmental studies.

UNIT – IV

9 Hrs

GENDER STUDIES

- Why should we study gender issues?
- Socializing – making women and making men
- Being together as equals – through lens of gender
- Missing women – gender selection and its consequences.
- Health issues of women.

UNIT – V

9 Hrs

GENDER & LABOUR – GENDER VIOLENCE AND LAW

- Housework - The invisible labour – my mother does not work “share the load”



- Women's work: Role in politics and Economics fact and fiction. Unrecognized and unaccounted work. Wages and conditions of work.
- Sexual harassment – say no eve teasing – the caste based violence – Nirbhaya Act.
- Domestic violence – Is home a safe place? Blaming the victim. - Domestic violence Act
- Forums of justice – Hindu Inheritance Act (2005).

SUGGESTED READING:

- A Suneetha, Uma Bhargubanda, Duggirala Vasanta, Rama Melkote, Vasuda Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu, 2010. Towards a World of Equals: A Bilingual Text on Gender. Hyderabad: Telugu Akademi.
- Rajagopalan R, 2015, Environmental Studies – From crisis to Cure. Third Edition. Chennai, Oxford University Press.
- Dr. D K Asthana and Dr. Meera Asthana, 2014, A textbook of Environmental Studies Revised Edition. New Delhi: S Chand & Company.
- Anubha Kaushik and C. P. Kaushik Published, 2016, Perspectives in Environmental Studies. Fifth Edition, New Delhi: New Age International.

(For Gender Sensitization)

- Sen Amartya, More than One Million women are Missing, New York Review of Books (20 December 1990) print. We were Making History.....Life stories of Women in the Telangana people's struggle. New Delhi, Kali for Women 1998.
- Tripathi Lahiri, By the Numbers: Where Indian Women Work. Women's Studies Journal (14 November 2012).
- K Satyanarayana and Susie Tharu Ed. Steel Nibs are Sprouting: New Dalit Writing from South India Dossier 2: Telugu and Kanada code = 372.
- Vimala Vantillu (The Kitchen). The women writing in India: 600 BC to the present. Volume II, The 20th century. Ed. Susie Tharu and K. Laitha, Delhi: Oxford University Press, 1995.
- Shatrughna, Veena, Women's work and its impact on Child health and Nutrition. Hyderabad. National Institute of Nutrition, Indian Council of Medical Research 1993.

**MACHINE LEARNING FOR EVERYONE****(GE (ID) – I)****Credits : 2****Semester: III****Subject Code : G24CSML1T****No. of Lecture hours: 30**

Objectives: To understand the basic theory underlying Machine Learning. To formulate ML problems corresponding to different applications. To understand the range of ML algorithms along with their strengths and weaknesses.

Course Outcomes:

CO 1: Understand the concepts of model selection, model complexity etc.

CO 2: Understand the fundamental issues, challenges, of Machine learning, importance of data preprocessing.

CO 3: Understand subtleties and application scenarios for different supervised classification.

CO 4: Construct various instant based learning and learning set of rules.

CO 5: Understand the concepts of neural networks architecture and various algorithms used.

UNIT I**6 Hrs**

- Introduction to Machine Learning for Everyone 1
- Machine Learning History 1
- Interesting Applications of Machine Learning 1
- Machine Learning Model Lifecycle 1
- A Day in the life of a Machine Learning Engineer 1
- Tools for Machine Learning 1

UNIT II**6 Hrs**

- Types of Machine Learning 1
- Well-Posed Learning Problem
- Applications Of Machine Learning
- Issues In Machine Learning 1
- Preparing To Model
- Basic Data Types; Exploring Numerical Data; Exploring Categorical Data 2
- Exploring Relationship Between Variables
- Steps involved in data preprocessing: handling NULL values and missing values
- Case study on mtcars dataset with and without missing values. 2

UNIT III**6 Hrs**

- Supervised learning – Regression: Simple linear regression
- Multiple linear regression 3
- Classification: k-Nearest neighbour, support vector machine



• Case study on house rent prediction	3
UNIT IV	6 Hrs
• Unsupervised learning: Basics of unsupervised learning	1
• clustering techniques-association rules- Apriori algorithm, K means, Hierarchical clustering.	2
• applications of clustering techniques, case study on customer segmentation.	3
UNIT V	6 Hrs
• Basics of Neural Network: Understanding biological neuron and artificial neuron	
• types of activation functions	2
• McCulloch Pitt's neural network with AND and OR gates	
• architectures of neural network	2
• learning process in ANN and what is back propagation (no algorithm required)	1

ESSENTIAL READING:

1. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, 2018, "Machine Learning", 1st Edition, Pearson Education.

**DATABASE MANAGEMENT SYSTEMS (DBMS)****(CORE COURSE - 7)****Credits : 4****Semester: III****Subject Code : CSML24302****No. of Lecture hours: 60****Objectives:**

- To form the basis for the bulk management of data.
- To offer the power to logically present the databases to individual usage as well.
- To provide facilitates for data access, enforcing data integrity, managing concurrency and restoring the data from backups.

Outcome:**CO1: Represent** logical database using Entity Relationship and enhanced ER Model.**CO2: Formulate** database using relational algebra and organize relation using normalization.**CO3: Design** SQL Queries and implement PL/SQL.**CO4: Classify** the storage and file structure, storage access, indexing and hashing techniques of the database.**CO5: Explain** the concept of transaction, recovery system and concurrency control.**UNIT - I****12 Hrs**

1. **Introduction:** Introduction to DBMS, System Structure 2
2. DDL, DML 2
3. Data Dictionary, Data base Administrator, DBA 2
4. Database levels, Data Independence 2
5. Data Base Design and E-R model: Entity – Relationship model, properties
Constraints and Occurrences 2
6. **Enhanced entity relationship model:** generalization, Specialization
Aggregation, Design Considerations 2

UNIT - II**12 Hrs**

1. **Relational model:** Structure 2
2. Reduction to Relational Schema 2
3. Relational Algebra 2
4. Modification of the Database 2
5. Normalization: First, Second 2
6. Third Normal forms and BCNF 2



UNIT - III	12 Hrs
1. SQL: Data Definition, Basic Structure of SQL Queries	1
2. Set Operations, Aggregate functions	2
3. Null Values, Nested Sub Queries	2
4. Joins, Modifications of the database, views	2
5. PL/ SQL: Programming, Procedures	1
6. Triggers, Cursors	1
7. Application Design & Development: Authorization in SQL – Granting of privileges	1
8. Granting privileges in SQL, roles, revoking of privileges, authorization on views, functions and procedures	1
9. Application security – Encryption Techniques	1
UNIT - IV	12 Hrs
1. File Organization, Organization of records in files	1
2. Indexing and Hashing: Index sequential, B+ tree index	2
3. Static Hash Functions, Dynamic Hash function	1
4. Comparison of Hashing and Indexing	1
5. Database System Architecture: Centralized	1
6. Client – Server & Server System Architectures	1
7. Distributed Databases: Homogeneous & Heterogenous Databases, Cloud – Based Databases	3
8. Concurrency Control in Distributed Databases	2
UNIT – V	12 Hrs
1. Recovery System: Failure classification	1
2. Transactions: Transaction concept, states	1
3. Implementation of atomicity and durability, concurrent executions	1
4. Serializability, testing for serializability	1
5. Concurrency Control: Lock based Protocols	1
6. Locks, granting of locks, two – phase locking protocols	1
7. Dead lock handing	2
8. Vector Databases: Introduction, difference between vector index and vector database, working of vector databases.	2
9. Graph databases: Introduction, graph database types, working of graphs and graph databases, advantages of graph database	2



ESSENTIAL READING:

1. Korth H.F. Silberschatz, S.Sudharshan, **Database System Concepts**. 5th Edition. New Delhi: Tata McGraw Hill Publishing Company Ltd.
2. Ivan Bayross. 2009, **SQL, PL / SQL (The Programming Language of Oracle)**, 4th Revised Edition. NewDelhi: BPB publications.
3. <https://www.pinecone.io/learn/vector-database/>
4. <https://www.oracle.com/in/autonomous-database/what-is-graph-database/>

SUGGESTED READING:

1. Fred R. McFadden, Jeffrey A Hoffer, Mary B.1999. **Modern Database Management**. 5th Edition. Asia: Pearson Education.

**DISCRETE MATHEMATICS****(CORE – 8)****Credits : 4****Semester: III****Course Code: BS18335****No. of Lecture Hours: 75****Objective:**

- To introduce lattices, Graph theory and to familiarize with the basic concepts of Number theory.

Course Outcomes:**CO1: Develop** understanding of Logic Sets and Functions**CO2: Evaluate** and apply the fundamental concepts in graph theory**CO3: Develop** an understanding of how graph and tree concepts are used to solve problems arising in the computer science.**CO4: Express** the concepts and results of Number Theory.**CO5: Identify** methods and techniques used in number theory.**UNIT- I****15 Hrs****LATTICES**

- | | |
|---|---|
| 1. Relations and ordering | 3 |
| 2. Partial order relations - Partially ordered sets | 3 |
| 3. Hasse diagrams | 3 |
| 4. Lattices - Properties of lattices | 3 |
| 5. Types of Lattices | 3 |

UNIT II**15 Hrs****GRAPH THEORY – I**

- | | |
|---|---|
| 1. Definition of a graph, Degree of vertex | 3 |
| 2. First theorem of graph theory Paths and connection | 3 |
| 3. Isomorphism of graphs | 3 |
| 4. Some special simple graphs | 6 |

UNIT III**15 Hrs****GRAPH THEORY – II**

- | | |
|--|---|
| 1. Trees and their properties | 9 |
| 2. Binary trees, Binary search trees, Spanning trees, Kruskal's Algorithm, | |



Prim's Algorithm, Planar graphs, Euler's formula 6

UNIT IV 15 Hrs

GRAPH THEORY-III

- | | |
|---|---|
| 1. Euler graphs | 5 |
| 2. Hamiltonian graphs- Grinberg theorem | 5 |
| 3. Chromatic numbers | 5 |

UNIT-V 15 Hrs

ELEMENTS OF NUMBER THEORY

- | | |
|--|---|
| 1. Divisibility- Division algorithm | 1 |
| 2. Euclid's algorithm | 2 |
| 3. Properties of G.C.D | 2 |
| 4. Primes – Fundamental theorem of Arithmetic. | 2 |
| 5. Congruence's – Properties | 2 |
| 6. Fermat's theorem and its Applications | 3 |
| 7. Wilson's theorem and its Applications | 3 |

ESSENTIAL READING:

1. Tremblay Jean, P. and Manohar, R. 2007. **Discrete Mathematical Structures with Applications to Computer Science**. New Delhi: McGraw-Hill. (For Unit I)
2. Mott Joe, L. Kandel Abraham. And Baker Theodore, P. 1999. **Discrete Mathematics for Computer Scientists and Mathematicians**. 2nd Edition. New Delhi: PHI (For Units II, III and IV)
3. Burton David, M. 2010. **Elementary Number Theory**. 7th Edition. New Delhi: McGraw-Hill. (For Unit V)



DIGITAL LOGIC AND DESIGN (CORE COURSE – 9)

Credits : 4

Semester: III

Subject Code: CSML24303

No. of Lecture hours: 60

Objectives:

- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
- To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcome:

CO1: Convert different type of codes and number systems which are used in digital communication and computer systems.

CO2: Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.

CO3: Analyse different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.

CO4: Design different types of with memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.

CO5: Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.

UNIT-I**12Hrs****Number system and Logic gates:**

Conversions of Binary, octal, Decimal & hexadecimal number systems	3
Complements (1's and 2's complement methods),	1
Binary addition and subtraction (1's and 2's complement methods).	2
Binary Codes-decimal Codes, Error detection codes, reflected Code	2
Logic gates- OR, AND, NOT, XOR, NAND, NOR gates and their Truth tables	1
Design of basic gates using the Universal gates- NAND and NOR gates.	1
Multilevel NAND circuits (implementation of a function only)	1
Exclusive –OR and equivalence functions (parity generation & checkers)	1



UNIT-II	12Hrs
Logic families and Boolean algebra:	
Transistor-Transistor Logic: TTL totem pole output, open collector output	2
Tri-state gate	
CMOS (Complementary metal oxide semi-conductor) – NAND, NOR gate	1
Boolean algebra - Laws and identities, DeMorgan's Theorems.	1
Simplification of Boolean expressions using Boolean identities	2
Reduction of Boolean expressions using Karnaugh Maps - Sum of Products (SOP) representation (up to four variables) including don't care conditions.	6
UNIT-III	12Hrs
Combinational Circuits:	
Introduction, Design procedure	2
Half adder, Full adder and parallel adder logic circuits	3
Sub tractors	1
Code conversion(BCD to Excess-3 Code)	1
Multiplexer	2
De-Multiplexer	1
Decoder (3 to 8)	1
Encoder (8 to 3).	1
UNIT-IV	12Hrs
Sequential Circuits:	
Introduction, Difference between Combinational and sequential	1
Flip-flops - SR, D, JK, T and Master-Slave JK	4
Flip flop excitation tables	2
Shift Registers : Types of Shift Registers (SISO, SIPO, PISO, PIPO)	2
4-bit bidirectional universal shift register	1
Analysis of clocked sequential circuits	2
UNIT -V	12Hrs
Counters:	
Design of counters	2
4-bit Asynchronous (Ripple) counter	2
Modulo-N counter	2



synchronous counter.	2
Memory: ROM, PROM, EPROM, EEPROM	2
SRAM & DRAM	2

ESSENTIAL READINGS:

1. Digital Electronics G. K. Kharate 2013 Oxford University Press.
2. Mano Morris M. 2008. Digital logic and Computer design. 3rd edition. New Delhi. Prentice Hall
3. Puri V.K. 1997. Digital Electronics: Circuits and Systems. 1st edition. New Delhi: Tata McGraw Hill.
4. Jain R.P. 2009. Modern digital electronics. 4th edition New Delhi: McGraw Hill Education.
5. Malvino & Leech. 1993. Digital principles and Applications. 8th edition. New Delhi: Tata Mc Graw Hill Education.



INTRODUCTION TO AI (CORE COURSE – 10)

Credits: 4**Semester: III****Course Code: CSML24304****No. of Lecture Hours: 60**

Objective: To familiarize with basic principles of AI and learn various applications of AI.

Course Outcomes:**CO1: Explain** types and AI applications.**CO2: Apply** search algorithms to solve AI problems.**CO3: Infer** first order logic to represent knowledge.**CO4: Explain** various reasoning in AI.**CO5: Develop** AI problems using prolog.**UNIT-I****12Hrs**

- | | |
|--|---|
| 1. Introduction, History, types and applications of AI | 2 |
| 2. Intelligent Agent-types of agents, Intelligent agent, Agent Environment | 2 |
| 3. Turing Test in AI | 1 |

PROBLEM SOLVING THROUGH AI

- | | |
|---|---|
| 4. Introduction, representation of AI problems | 2 |
| 5. Production system, Algorithm of Problem solving | 1 |
| 6. Examples of AI problems-Water Jug Problem, Magic Square, TSP | 2 |
| 7. Missionaries and Cannibals problem, Towers of Hanoi, Nature of AI problems | 2 |

UNIT-II**12Hrs**

- | | |
|--|---|
| 1. Search Algorithms, Uninformed Search Algorithms | 4 |
| 2. Informed search algorithms-Best-first search, A*, AO* Algorithm | 3 |
| 3. Constraint satisfaction, Means Ends Analysis | 3 |
| 4. Min-Max search and alpha-beta pruning | 2 |

UNIT-III**12Hrs**

- | | |
|---|---|
| 1. Knowledge based agent, knowledge representation-types of knowledge | 3 |
| 2. Knowledge representation techniques, Propositional logic | 3 |
| 3. Rules of inference, Wumpus world- Knowledge base | 3 |
| 4. First order logic, Inference in FOL, Unification and resolution in FOL | 3 |

**UNIT-IV****12Hrs**

- | | |
|---|---|
| 1. Forward and backward chaining, Forward vs Backward chaining | 2 |
| 2. Reasoning in AI, Inductive vs Deductive reasoning | 3 |
| 3. Probabilistic reasoning in AI, Bayes theorem and Bayesian Belief network | 4 |

PLANNING

- | | |
|---|---|
| 4. Planning-components, block world planning, identifying solution, Goal stack Planning | 3 |
|---|---|

UNIT - V**12Hrs**

- | | |
|--|---|
| 1. Introduction to Prolog, Basics, Relations, Prolog Syntax, data objects | 3 |
| 2. Types of Prolog, Operators, Loop and Decision Making | 3 |
| 3. Conjunctions and disjunctions, Lists, recursion and structures | 3 |
| 4. Backtracking, Inputs and outputs, different and not, clauses and predicates | 3 |

ESSENTIAL READING:

1. Kumar, Ela. 2019. "Artificial Intelligence", 1st Edition. I.K International Publishing House Pvt. Ltd. India: New Delhi.
2. RusselJ, Stuart. Norvig, Peter. 2015. Artificial Intelligence, A Modern Approach. 3rd Edition. Pearson Education. New Delhi: India.

SUGGESTED READING:

1. Kaushik, Saroj. 2019. Artificial Intelligence. First Edition. CENGAGE LEARNING. India: New Delhi
2. Rich, Eliane. , Knight, Kevin, Nair. Shiv Shanker. 2008. Artificial Intelligence. 3rd Edition. TMH. India: New Delhi

**MACHINE LEARNING FOR EVERYONE PRACTICAL****(GE (ID) – I)****Credits : 1****Semester: III****Subject Code : G24CSML1P****No. of Practical hours: 30**

Objectives: To understand the basic theory underlying Machine Learning. To formulate ML problems corresponding to different applications. To understand the range of ML algorithms along with their strengths and weaknesses.

Outcome: To understand the features of machine learning and to apply them on real world problems.

Note: Practical's to be performed using Weka software.

List of Practical Programs:

1. Read an excel sheet to Weka environment.
2. Read a csv and Excel files to Weka environment.
3. Read table into Weka environment.
4. Data pre-processing – checking null values, data types –changing data types to numerical if needed.
5. Implement linear regression.
6. Implement multiple linear regression.
7. Implement k means algorithm.
8. Implement SVM.
9. Implement k nearest neighbor.
10. Implement apriori algorithm.

CASE STUDIES:**Case Study 1: Movie Recommendation System**

Scenario: An online streaming platform wants to enhance user experience by recommending movies based on user preferences.

Objective: Develop a basic recommendation system using user ratings and movie metadata.

Tasks:

- Explore and preprocess movie ratings data.
- Implement a simple collaborative filtering algorithm.
- Evaluate the recommendation system's effectiveness.

Supervised Learning**Case Study 2: Predicting Housing Prices**



Scenario: A real estate agency wants to predict housing prices based on various features like square footage, number of bedrooms, and location.

Objective: Build a regression model to predict house prices.

Tasks:

- Collect and preprocess housing data.
- Train a linear regression model using scikit-learn.
- Evaluate the model's performance and interpret coefficients.

Unsupervised Learning

Case Study 3: Customer Segmentation for an E-commerce Platform

Scenario: An online retailer wants to understand its customer base and tailor marketing strategies.

Objective: Apply clustering algorithms to segment customers based on their purchasing behavior.

Tasks:

- Analyze and preprocess customer transaction data.
- Apply K-Means clustering to identify customer segments.
- Visualize and interpret the customer segments.



DBMS PRACTICAL (CORE COURSE - 7)

Credits: 1**Semester: III****Subject Code: CSML24306****No. of Practical hours: 30**

Objective: To facilitate data access, enforcing data integrity, managing concurrency and restoring the data from backups.

Outcome: Students will be able to design principles for logical design of databases, including the E -R method and normalization approach.

List of Practical Programs

1. Create Employee Table with the following Fields

Eno, ename, joining date, salary, job, commission, deptno

Eno	Ename	Salary	Job	Commission	Joiningdate	Deptno
1	Sita	5000	Clerk	800	12-jan-90	10
2	Rita	8000	Salesman	600	25-mar-02	20
3	Geetha	54000	HR	700	11-jun-05	30
4	Rahul	8900	Finance	850	15-dec-10	10
5	swetha	15000	Marketing	900	18-sep-09	20

Execute the following Queries.

- a) Insert at least 5 records.
- b) Write a query to display the data in table as follows:
- c) Write a query to eliminate duplicate rows using select statement.
- d) Write a query to sort the data in a table.
- e) Write a query to create a table from another table.
- f) Write a query to creating a table from a table by specifying certain condition.
- g) Write a query to insert data into a table from another table.
- h) Write a query to creating a table from a table by specifying certain condition.
- i) Write a query to modify the structure of the table.
- j) Write a query to drop a column from a table.
- k) Queries using Aggregate Functions, Sub Queries.



2. Create a department table with the following fields.

Deptno, deptname, Location

Deptno	Department Name	Location
10	Clerk	New York
20	Sales	Sydney
30	Hr	Dallas
10	Finance	Texas
20	marketing	North Carolina

Execute the following on EMP & Dept database

- Orderby clause
- Date Functions
- Group By Clause
- Sub Queries
- Group Functions
- Joins
- Set Operators
- Views

3. Create Table Student with the following Fields sno, sname, group, marks, percentage.

Sno	Group	Sub1	Sub2	Total Marks	percentage
1	BA	53	78	131	54
2	BSC	86	45	131	64
3	BCOM	79	23	102	51
4	BBA	42	98	140	70
5	MSC	56	46	102	51

Execute the Following Queries:

- Write a query to find the average of marks of Student table.
- Write a query to find the minimum value of marks of student table.
- Write a query to find the maximum value of marks of student table.
- Write a query to implement count function in student table.
- Write a query to implement sum function in student table.

PL/SQL Programs

- PL/SQL to add two numbers.
- PL/SQL to find factorial of a number.
- PL/SQL for demo on for loop
- PL/SQL for case structure
- PL/SQL/ for simple loop



6. PL/SQL to increase the value by 10.
7. PL/SQL for performing arithmetic operations.
8. PL/SQL to find square, cube, double of a number.
9. PL/SQL program to swap two numbers.
10. PL/SQL program to find multiplication tables.
11. PL/SQL to determine whether a year is leap year or not
12. PL/SQL to delete an item whose itemnum=4
13. PL/SQL program for inverting a number.
14. PL/SQL program to calculate the area for circle for value of radius ranging from 3 to 7
15. Write a program to print empno, ename, job and salary of an employee given empno
16. Write a PL/SQL block that will increase the salary by 100 if salary is greater than 1000 for a empno.
17. Write a PL/SQL block using the cursor to display details of all employees from emp table whose sum of sal and commission is greater than 2000.
18. PL/SQL to update salary of an employee whose empno and increment mentioned.
19. Write a PL/SQL block which accepts the empno from the user and display the details of the employee. When the user enters an empno that is not in the emp table then PL/SQL block must display an appropriate message to the user
20. PL/SQL that creates a trigger that inserts or update values of ename, job as lower-case strings.
21. PL/SQL to implement standalone procedure in INOUT mode.
22. PL/SQL to create a function to find out total number of Employees in the emp table.
23. PL/SQL to handle ZERO_DIVIDE Exception.



DIGITAL LOGIC & DESIGN PRACTICAL
(CORE COURSE – 9)

Credit:1

Semester: III

Course Code: CSML24307

No. of practical hours: 30

Objectives:

- To implement simple logic operations using combinational logic circuits.
- To design combinational and sequential logic circuits in virtual and real environments.

Outcome: Students will be able to implement and design simple logical operations using combinational and sequential logic circuits.

List of Experiments:

1. Study of Logic Gates.
2. Design of Adders and Subtractors (Half, Full and Binary).
3. Study of Magnitude Comparator.
4. Code Converter.
5. Parity Generators and Checkers.
6. Study and Design of Flip Flops using gates and IC's.
7. Design of Registers using Flip Flops and ICs.
8. Design of Counters using Flip Flops and ICs.
9. Simulation experiments: Adder, subtractors.
10. RS & JK flipflops.



INTRODUCTION TO AI PRACTICAL
(CORE COURSE – 10)

Credits: 1**Semester: III****Course Code: CSML24308****No. of practical hours: 30****Objective:** To demonstrate problems in AI.**Outcome:** Identify the problems where Artificial Intelligence techniques are applicable.**List of Practical Programs:**

1. Write a program in Prolog to implement simple facts and Queries.
2. Write a program in Prolog to Print the age and name of the person.
3. Write a program in the prolog to implement the sum of 3 numbers.
4. Write a program in Prolog to implement simple arithmetic.
5. Write a program in Prolog to implement temperature conversion.
6. Write a program in Prolog to implement square root and check even or odd.
7. Write a program in Prolog to check whether the character is lowercase or uppercase.
8. Write a program in Prolog to implement a minimum of two numbers.
9. Write a program in Prolog to implement the length of the string.
10. Write a program in Prolog to implement the Concatenation of two strings.
11. Write a program in the prolog to implement the factorial of a number.
12. Write a program in Prolog to implement the Fibonacci series.
13. Write a program in Prolog to print numbers from 1 to 10.
14. Write a program in Prolog to implement GCD and LCM of two numbers.
15. Write a program in Prolog to find the length of a list.
16. Write a program in Prolog to find the sum of numbers in the list.
17. Write a program in Prolog to find the maximum number in the list.
18. Write a program in Prolog to implement the Reverse of a list.
19. Write a program in Prolog to Check for membership in a list.
20. Write a program in Prolog to perform the insertion, deletion, append, and concatenation of a list.
21. Write a program in Prolog to check for even or odd lengths in the list.
22. Write a program in Prolog to Perform read and write operations.
23. Write a program in Prolog to implement simple arithmetic.
24. Write a program in Prolog to solve the Tower of Hanoi.
25. Write a program in Prolog to solve 8 Puzzle problems.
26. Write a program in Prolog to solve the 4 - Queens problem.
27. Write a program in Prolog to solve the Traveling salesman problem.
28. Write a program in Prolog for Water jug problem.