ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING AND TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2024-25

Computer Science and Engineering (Cyber Security)

SEMESTER IV

SrNo	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks			Total	No of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination		
1	PCC	24CS401T	Security Policies and Implementation	3	-	-	3	20	20	60	100	3
2	PCC	24CS402T	Database Management System	3		-	3	20	20	60	100	3
3	PCC	24CS402P	Database Management System Lab	-	-	2	1	-	25	25	50	-
4	PCC	24CS403P	Computer Network Security Lab	-	-	2	1	-	25	25	50	-
5	PCC	24CS404T	Secure Software Engineering	2	-	-	2	10	10	30	50	1.5
6	VSC	24CS405P	Technical Skill Development – I		-	4	2	-	50	-	50	
7	AEC	24CS406T	Economics and Management	3	-	-	3	20	20	60	100	3
9	SEC	24CS441P	Career Development – IV	-	-	2	1	-	50	-	50	-
8	ELC	24CS407P	Micro Project II*	-	-	2	1	-	50	-	50	-
10	MDM	24CS431M	Multidisciplinary Minor- II	3	-	-	3	20	20	60	100	3
Total				14	-	12	20	90	290	320	700	-

Course Code	Course Title
24CS431M	Cyber Security Tools and Operating System

Chairman - BoS	Dean – Academics	JULY 2025	NEP 2.1	Applicable for 2025-26
		Date of Release	Version	

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits		valuation		
						MSE	CA	ESE	Total
24CS401T	Security Policies and Implementation	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
This course is intended 1. To analyze the need for security policies, procedures and security awareness. 2. To understand the types & approaches of policy designing. 3. To identify security policies considerations & implement them. 4. To critique existing security policy for its effectiveness and completeness.	**Students will be able to** 1. Explain the fundamentals of IT security policies and their business drivers. 2. Identify national and international compliance laws and governance challenges. 3. Apply standard frameworks to design and implement IT security policies. 4. Differentiate types of security policies across various IT domains. 5. Analyze and recommend cyber security policies through real-world case studies.

Unit I : The Need for IT Security Policy Frameworks	**[9Hrs]**
Introduction to Security Policies, Information Systems Security, Information Assurance Information systems Security Policies, Business Drivers for Information Security Policies.	
Unit II: : Role of Governance and Business	**[9Hrs]**
Compliance Laws – India, Compliance Laws – International, Seven Domains of IT Infrastructure, Business Challenges & Policies to Mitigate the Risks, Information Security Policy Implementation Issues	
Unit III: Policy Framework & Designing	**[9Hrs]**
Program Framework Policy, Business Considerations for Framework, Information Assurance Considerations, IT Security Standards & Frameworks, How to Design, Organize, Implement & Maintain IT Security Policies, IT Security Policy Framework Approaches	
Unit IV: Types of Policies	**[9Hrs]**
User Domain Policies, IT Infrastructure Security Policies, Data Classification and Handling Policies, Risk Management Policies, Incident Response Team (IRT) Policies, Special Access Policies, Physical Security Policy, DLP Policies,	
Unit V	**[9Hrs]**
Project 1 – Research on Existing and/or Lack of Cybersecurity Polices in Local IT Companies, Analyse the Results and Generate a Comprehensive & Customised List of Cybersecurity Policies for the Companies	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Security Policies and implementation Issues	Robert Johnson & Chick Easttom. Jones & Bartlett Learning	Third Edition	. Wiley Publishing.
2	Computer Security Handbook	y Seymour Bosworth, M.E. Kabay & Eric Whyne	Fifth Edition	Wiley Publishing

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The Cyber Crime Law and Practices	CS Mamta Binani	1st	The Institute of Company Secretaries of India

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation		
24CS402T	Database Management System	3	-	-	3	MSE	CA	ESE	Total
						20	20	60	100

Course Objectives	Course Outcomes
This course is intended to provide 1. To provide understanding of issues involved in design, implementation & manipulation of a relational DBMS. 2. To enable the student to design and build simple database systems and demonstrate the competence with the fundamental tasks involved with modeling, designing and implementing a DBMS. 3. To develop comprehension of essential concepts of normalization, concurrency, integrity and security along with the advancements in DBMS.	**Student will be able to:** 1. Explain DBMS architecture, data models, relational model concepts, and construct ER diagrams and SQL queries. 2. Apply functional dependency principles and normalization techniques to design optimized and consistent relational databases. 3. Analyze and evaluate query processing strategies and indexing techniques to improve database performance and storage efficiency. 4. Demonstrate concurrency control and recovery mechanisms to ensure reliable and secure transaction management. 5. Compare traditional relational databases with emerging Big Data and NoSQL technologies and select appropriate systems based on application requirements.

Unit I **[9 Hrs]**
Introduction: DBMS Architecture, Data Models.
Relational Model: Entity-Relationship model, Relational model, Database schema, Keys, Relational query languages: Relational algebra, SQL.
Unit II **[10 Hrs]**
Relational Database Design: Dependency theory - functional dependencies, Armstrong's axioms for FD's, closure of a set of FD's, minimal covers, Normalization - 1NF, 2NF, 3NF and BCNF, Non-loss Decomposition & Dependency preservation, Multi- valued dependencies and 4NF, Join dependencies and definition of 5NF.
Unit III **[9 Hrs]**
Query Processing & Optimization: Query Processing, Evaluation of relational algebra expressions, Algorithms for SELECT and JOIN operations, Query optimization using Heuristics and Cost Estimation, Materialized Views.
Storage Structure & strategies: RAID, Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing.
Unit IV **[9 Hrs]**
Transaction Processing : Transaction Concepts – ACID Properties – Schedules – Serializability – Concurrency Control – Need for Concurrency – Locking Protocols – Two Phase Locking.
Database Recovery: Failures and their classification, recovery and atomicity, recovery algorithms.
Unit V **[8 Hrs]**
Big Data & NoSQL databases: Big Data : Introduction to Big Data & Big Data Challenges, Hadoop & its Features, Hadoop Ecosystem.
NoSQL Database: Concepts and evolution, Characteristics and significance, Key-value database, Graph Databases, Document Databases.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Database System Concepts	Henry F. Korth, Abraham Silberschatz, S.Sudarshan	2nd Edition	Mcgraw Hill Education
2	Learning SQL	Alan Beaulieu	2nd Edition	O'Reilly Publications
3	The Art of SQL	Stephane Faroult, Peter Robson	2nd Edition	O'Reilly Media

Reference Books

S.No	Title	Authors	Edition	Publisher
1	An Introduction to Database Systems	C.J.Date, A.Kannan,	8th Edition	Pearson Education
2	Next-Generation Databases	Guy Harrison.		Apress

		July 2025	NEP 2.1	Applicable for 2025-26
Chairman - BoS	Dean – Academics	Date of Release	Version	

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS402P	Database Management System Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended 1. To provide ability to the student to design & implement an application based Database Management system and manipulate using SQL. 2. To enable the student to work conveniently on modern tools of database management.	**Students will be able to** 1. Implement and analyze data storage problem and derive a data model expressed in the form of an entity relationship or relational model 2. Use a SQL relational DBMS package to create, secure, populate, maintain, and query a database. 3. Implement an application to access a database using ODBC/JDBC connectivity.

Experiment No.	Name of Experiment	CO Mapped
1	To perform basic SQl commands on MySQL.	1
2	Introduction to SQL and DML query solving using SQL simulator sql-ex.ru.(1-15)	1
3	Introduction to SQL and DML query solving using SQL simulator sql-ex.ru. (16-30).	1
4	Design an ER diagram for your Mini Project including data definition, constraints and schema design.	1,2
5	Design, develop, and implement the specified queries for the above design using Oracle, MySQL, MS SQL Server, or any other DBMS under LINUX/Windows environment.	1,2
6	Demonstration of join operations.	2
7	Demonstration of Views, Procedures, Functions & Triggers.	2,3
8	To demonstrate database vulnerability and secure coding practices.	1,2,3
9	To understand how to secure database objects using user roles and privileges.	1,2,3
10	Mini project on case study using Database Connectivity with Front End Tools	1,2,3

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS403P	Computer Network Security Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended 1. To develop fundamental skills in designing and configuring basic computer networks using Cisco Packet Tracer, including IP addressing, routing, switching, and wireless setups. 2. To enable students to implement essential network security techniques such as VLANs, ACLs, port security, DHCP security, and NAT for ensuring secure and efficient network operations. 3. To provide hands-on experience in monitoring, testing, and troubleshooting network configurations to understand secure communication, access control, and threat prevention in real-world scenarios.	**Students will be able to** 1. To design and configure basic computer networks using routers, switches, VLANs, DHCP, and NAT in Cisco Packet Tracer. 2. To implement fundamental network security mechanisms such as ACLs, port security, and wireless security for secure communication. 3. To analyze and troubleshoot network connectivity and security issues using Packet Tracer simulation tools.

Expt. No.	Title of the experiment
1	**Create a Simple Network Topology** ● Connect PCs, switches, routers, Assign IP addresses, Test connectivity using ping
2	**Configure Static Routing** ● Connect two or more networks, Set static routes, Verify packet delivery
3	**Configure VLANs** ● Create VLAN10, VLAN20, Assign switch ports, Test communication inside and between VLANs
4	**Configure Inter-VLAN Routing** ● Use Router-on-a-Stick, Allow communication between VLANs
5	**Configure Basic Access Control List (Standard ACL)** ● Block/allow traffic based on source IP, Apply ACL to router interface
6	**Configure Extended ACL** ● Filter traffic based on source/destination IP, Control access to services (HTTP, FTP, etc.)
7	**Implement Port Security** ● Limit number of MAC addresses, set violation mode (shutdown), Test unauthorized access
8	**Configure Wireless Network Security (WPA2)** ● Set SSID, password, Configure wireless devices, Test secure connectivity
9	**Configure NAT (Network Address Translation)** ● Convert private to public IP, configure static/dynamic NAT, Verify translation
10	**Configure DHCP Server** ● Automatic IP assignment, Scope, default gateway, DNS, Test IP leasing on PCs

Text Books

S.N	Title	Authors	Edition	Publisher
1	Network Security: A Beginner's Guide	Eric Maiwald	2nd Edition	McGraw-Hill
2	Network Security, Firewalls, and VPNs	J. Michael Stewart	1st / 2nd	Jones & Bartlett Learning

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CS404T	Secure Software Engineering	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended to provide 1. Understand fundamental software engineering concepts with a focus on building secure and reliable systems. 2. Develop skills for gathering, modelling, and analysing requirements with emphasis on security needs. 3. Equip students with secure design principles, threat modelling, and defensive development practices. 4. Provide knowledge of testing, quality assurance, and configuration management for secure software.	Student will be able to: 1. Select and justify software process models, gather and analyze functional, non-functional, and security requirements, and prepare a complete SRS. 2. Apply secure software design principles, including risk assessment, threat modelling, and user-centered secure design, to develop secure software solutions. 3. Perform secure software testing and ensure software quality through reviews, audits, and configuration management practices.

Unit I : Software Engineering & Security-Driven Process Models **[10Hrs]**

Introduction to Software: Characteristics, Types, and Role of Software in Cyber Security, Role of a Secure Software Engineer in SDLC, Phases of Secure SDLC, Software Process Models: Waterfall, Spiral, Incremental, V- ModelEvolutionary Models, Agile Processes with Security Considerations: Scrum, Extreme Programming (XP)Sprint Planning, Daily Scrum, Sprint Backlog, Tracking Scrum Metrics for Secure Development, Secure SDLC Models
(SDL, SAMM, BSIMM)

Unit II: Requirements Engineering & Secure Software Design **[10Hrs]**

Requirements Engineering: Requirement Initiation, Eliciting Security Requirements from Stakeholders, Requirement Analysis Techniques (Use Cases, Misuse Cases), SRS with Security Requirements (CIA triad, Access Control, Audit Requirements), Software Design Fundamentals, Secure Design Principles (Saltzer & Schroeder Principles), User Interface Design with Security: User-Centered Secure Design, Usability vs. Security Balance, Risk Management in
Software Engineering, Reverse Engineering and Its Role in Cyber Security, Introduction to Threat Modeling.

Unit III: Secure Software Testing & Quality Assurance **[10Hrs]**

Types of Software Testing: White Box Testing (including input validation, control flow testing), Black Box Testing (boundary tests, security test cases), Unit Testing & Integration Testing, Debugging Techniques, Software Project Planning with Security Tasks, Software Quality Assurance (SQA): Security-Focused SQA, Software Quality Factors (McCall, Boehm), Software Reviews & Security Audits, Secure Configuration Management (SCM): Version Control, Secure Build and Release Management

Text Books

S.N	Title	Authors	Edition	Publisher
1	Software Engineering, A practitioner's Approach	Roger Pressman	7th Edition	Tata Mcgraw Hill
2	Object Oriented Software Engineering Using UML Patterns and Java	Bernd Bruegge & Allen H. Dutoit.	2nd Edition,	

Reference Books

S.N	Title	Authors	Edition	Publisher
1	OOA and Design	Grady Booch	3nd Edition,	Ad. Wesly
2	OO Modeling and design	Rambhaugh	2nd Edition,	PHI

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS405P	Technical Skill Development – I	-	-	4	2	50	-	50

Course Objectives	Course Outcomes
This course is intended 1: Develop practical skills in implementing and analyzing the time and space complexity of fundamental and advanced algorithms. 2: Apply algorithmic strategies such as greedy method, divide-and-conquer, dynamic programming, and backtracking to design efficient solutions for computational and optimization problems. 3: Build technical competency through hands-on coding, performance evaluation, and problem-solving using graph algorithms, DP, and state-space search techniques	Students will be able to 1. Implement and analyze the performance of basic and advanced sorting and searching algorithms using appropriate complexity metrics. 2. Apply greedy strategies to solve scheduling, resource allocation, and shortest path problems, and evaluate their computational efficiency. 3. Develop and assess dynamic programming solutions for complex optimization and shortest path problems such as 0/1 Knapsack, TSP, and Floyd–Warshall. 4. Design and implement backtracking-based solutions for constraint satisfaction problems including 8-Queens, Graph Coloring, and Subset Sum with effective pruning strategies.

UNIT	Contents **Design and Analysis of Algorithm**
1	**Basic Algorithms & Complexity**: Experiment 1: Implementation & time complexity analysis of basic sorting algorithms Bubble Sort, Insertion Sort, Selection Sort Experiment 2: Implementation & analysis of Advanced Sorting Algorithms: Merge Sort, Quick Sort (Comparison of Divide & Conquer techniques) Experiment 3: Implementation of Searching Techniques: Linear Search, Binary Search (Comparison of their time complexities on various inputs)
2	**Greedy Method** Experiment 4: Job Sequencing with Deadlines using Greedy Approach (Profit maximization + complexity evaluation) Experiment 5: Fractional Knapsack Problem using Greedy Method (Efficiency comparison using different item sets) Experiment 6: Dijkstra Shortest Path Algorithm (Hands-on path optimization + time complexity analysis) Experiment 7: Minimum Cost Spanning Tree using Kruskal's Algorithm (Union–Find + sorting–based optimization) Experiment 8: Minimum Cost Spanning Tree using Prim's Algorithm (Adjacency matrix vs adjacency list performance comparison)
3	**Dynamic Programming (DP)** Experiment 9: All-Pairs Shortest Path using Floyd–Warshall Algorithm (Time complexity O (n^3) demonstration) Experiment 10: Travelling Salesman Problem (TSP) using Dynamic Programming (Small input sets + exponential complexity observation) Experiment 11: 0/1 Knapsack Problem using Dynamic Programming (Bottom-Up DP) (Compare results with Greedy Fractional Knapsack)
4	**Backtracking & State-Space Search** Experiment 12: 8-Queens Problem using Backtracking (Node exploration + pruning techniques) Experiment 13: Graph Coloring Problem using Backtracking (Chromatic number computation for sample graphs)
5	**Advanced/Optional Skill Enhancement** Experiment 14: Subset Sum / N-Queens / Sudoku Solver using Backtracking (Any One) (Shows complexity explosion + solution pruning)

Text Books

S.N	Title	Authors	Edition	Publisher
1	Introduction to Algorithms	Cormen T.H	Second	Prentice Hall of India
2	Foundations of Algorithms	S. R. Sathe	Second	Penram International

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Computer Algorithms	Horowitz, Sahani, Rajsekharan	Second	Galgotia Publications Pvt. Ltd
2	Fundamentals of Algorithms	Brassard, Bratley	Second	Prentice Hall
3	Data Structures and Algorithms	Alfred V. Aho, John E. Hopcroft , J. D. Ullman	Reprint 2006	Pearson Education

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CS406T	Economics and Management	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
The course examines how the economics, business and industrial management practices are related and how business decision is taken.	At the end of the course, students will be able to: 1. Apply managerial economics concept in business analysis and business decision making. 2. Explain relationships between production and costs and understand different forms of market structures. 3. Assess impact of macroeconomics and government policies on business and economy. 4. Recognize the functions of management and marketing management for business decisions. 5. Explore role of financial management in business and decision making.

Unit I **[9 Hrs]**

Economics, Classification of economics, Industrial economics, Consumer demand, Law of Demand, Determinants of demand, Demand forecasting, Law of supply, Utility, Law of diminishing marginal Utility, Types of Elasticity of demand

Unit II **[9 Hrs]**

Concept of Production, Factors of Production, Laws of return, Cost concepts and types of cost, cost curves, Market Structures Perfect competition, Monopoly, Oligopoly, and Monopolistic competition.

Unit III **[9 Hrs]**

The functions of central bank, Inflation, Deflation, Recession. Measures to control Inflation, National income, GDP, GNP. Liberalization, Privatization and Globalization

Unit IV **[9 Hrs]**

Definition of management, functions of management – planning, organizing, directing, Controlling, Introduction to human resources Management, Marketing Management, Concepts of Marketing, Marketing mix, Methods of pricing, channels of distribution, advertising and sales promotion.

Unit V **[9 Hrs]**

Financial Management, nature and scope of financial management, Sources of finance, Types of capital, Brief outline of profit and loss account, balance sheet, Budgets and types of budgets, Ratio analysis.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Managerial Economics	D.N. Dwivedi	8th	Vikas Publishing
2	Modern Economic Theory	K.K. Dewett	2005	S. Chand Publisher
3	Industrial Management	Dr.I.K. Chopde, Dr.A.M. Sheikh	Revised Edition	S. Chand Publisher

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Industrial Organization and Industrial economics	T.R. Banga, S.C. Sharma	2006	Khanna Publishers

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation		
24CS431M	MDM – II Cyber Security Tools and Operating System	3	-	-	3	MSE	CA	ESE	Total
						20	20	60	100

Course Objectives	Course Outcomes
This course is intended 1. To provide the overview of types of architectures and Virtualization. 2. To learn Linux system and commands. 3. To implement and learn the concepts of network analyzing tools. 4. To understand working principle of Kali Linux operating System.	**Students will be able to** 1. Understand the basic of virtualization. 2. Implement and execute the commands of Linux system. 3. Understand the Cyber security and Information security, Attacks. 4. Understand the basic of Hacking and penetration testing. 5. Use and implement NMAP and Wireshark tools.
Unit I	**[8 Hrs]**
Virtualization: Virtualization architecture, Traditional Vs Virtual architecture, Types of Virtualizations, Benefits of virtualization, Disadvantage of virtualization, Hardware – assisted virtualization.	
Unit II	**[10 Hrs]**
Introduction to Linux: Features, Shell, Shell Types, Terminal, Basic commands, Basic networking commands, File Handling commands, Linux/ Unix file system architecture, Linux file Hierarchy concepts, File and Directory names, Absolute and relative path names, Linux file permission and basic user management.	
Unit III	**[10 Hrs]**
Cyber Security: Definition, Cyber Security vs Information Security, Threats, Vulnerabilities and Attacks, Risk and Control, Basic components of Information Security, Goals of Information security, Threats to Information security.	
Unit IV	**[9 Hrs]**
Ethical hacking and Penetration Testing: Definition, Needs and Methods, Phases of Ethical Hacking and penetration testing, Hacker and Types of hackers, Types of penetration testing, Services and tools, Role as Penetration tester, Highlights to protect the system.	
Unit V	**[8 Hrs]**
Kali Linux: Introduction, Introduction to NMAP, NMAAP scan types, NMAP commands, Introduction to Wireshark.	

Text Books

S. N	Title	Authors	Edition	Publisher
1	Cyber Security	Nina Godbole, Sunil Belapure	I Edition	Wiley India Pvt ltd
2	Operating System	Abraham Silberschats	Global Edition	Wiley India Pvt ltd

Reference Books

S. N	Title	Authors	Edition	Publisher
1	The Ultimate Kali Linux Book: Perform advanced penetration testing using NMAP, Metasploit, Aircrack-ng and Empire	Glen D. Singh	2nd Edition	Packt Publishing Ltd, 2022

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS441P	Career Development – IV	-	-	2	1	50	-	50

Course Objectives	Course Outcomes
The sole objective of imparting aptitude training is to make students able to critically evaluate various real-life situations by resorting to an analysis of key issues and factors. This Aptitude Training helps them to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions. To categorize, apply and use thought process to distinguish between concepts of Quantitative methods.	1. Students shall understand the concepts of Quadratic Equation, AP, GP, and HP. 2. Students shall understand the concepts of Averages and Mixture and allegations 3. Students shall understand the concepts of Blood relation. 4. Students shall understand the concept of Dice and Cubes 5. Students shall understand the concepts of clocks and Calendars.

Unit I	**[6Hrs]**
Aptitude : Quadratic Equation Arithmetic progression, Geometric progression, Harmonic progression Imax: Critical Thinking, Interview Simulation, Engineering Leadership, Spatial Reasoning	
Unit II	**[6Hrs]**
Aptitude : Average Mixture and Allegation Imax: Interactive Interview Training, Start-Up & Entrepreneurship,	
Unit III	**[6Hrs]**
Aptitude : Blood Relation :- Family Tree, Coding Blood Relation, Pointing to a Person Problem Imax: Engineering Ethics, Employability, Engineering Judgment	
Unit IV	**[6Hrs]**
Aptitude : Cubes and Dice Problems:- Number of cuts to be made, Number of colorful Faces of Cubes, Hidden Dice Number Imax: Disposition for Innovation, Disposition for Start up	
Unit V	**[6Hrs]**
Aptitude : Clocks :- Angle made by Hour hand, Minutes hand, Mirror and water Image of Clock, Behind and Ahead time concept Calendars :- Day on Specific date, Coded Calendars Problems, Calendars repetition Imax: Creating A Winning Resume, Patriotism Self - respect & Start - up	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Quantitative Aptitude By R. S. Aggarwal	R.S. Aggarwal		
2	Quantitative Aptitude	Shripad Deo		Allied Publication
3	A Modern Approach to Verbal & Non-Verbal Reasoning	R.S. Aggarwal		

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Quantitative Aptitude for CAT by Arun Sharma	Arun Sharma		

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CS407P	Micro Project - II *	-	-	2	1	--	50	--	50

Course Objectives	Course Outcomes
The Micro Project II course is designed to sensitize students to societal and community-oriented problems and enable them to apply data science concepts for social good. The course aims to provide hands-on experience in identifying real-world community issues, collecting and analyzing data, and proposing data-driven insights or solutions using basic data science tools and methodologies. This course emphasizes experiential learning, ethical data handling, teamwork, and reflective learning aligned with NEP 2.0.	1 Identify and clearly define a community or societal problem that can be addressed using data-driven approaches. 2 Apply fundamental data science techniques such as data preprocessing, basic statistical analysis, and simple visualization to extract meaningful insights. 3 Design and implement a basic data-driven model, dashboard, or analytical report that addresses the identified community problem. 4 Work effectively as an individual or in a team to plan, execute, document, and present the micro project outcomes. 5 Evaluate the impact, usefulness, and limitations of the proposed solution and reflect on learning gained through community engagement.

	[2Hrs]
Students shall undertake a Micro Project based on Community Engagement, preferably in collaboration with local communities, NGOs, schools, healthcare centers, municipal bodies, or campus-related stakeholders. The project should focus on applying data science concepts to solve or analyze a real-life problem of societal relevance.	