ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

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

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

COMPUTER SCIENCE AND BUSINESS SYSTEMS

SEMESTER IV

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24CB401T	Operating Systems	3	-	-	3	20	20	60	100	3
2.	PCC	24CB401P	Operating Systems Lab	-	-	2	1	-	25	25	50	-
3.	PEC	24CB402T	Introduction to Innovation, IP Management & Entrepreneurship	2	-	-	2	10	10	30	50	1.5
4.	PEC	24CB403T	Operations Research	2	-	-	2	10	10	30	50	1.5
5.	PEC	24CB404T	Marketing Research & Marketing Management	2	-	-	2	10	10	30	50	1.5
6.	PCC	24CB405T	Database Management Systems	3	-	-	3	20	20	60	100	3
7.	PCC	24CB405P	Database Management Systems Lab	-	-	2	1	-	25	25	50	-
8.	PCC	24CB406T	Software Design with UML	2	-	-	2	10	10	30	50	1.5
9.	PEC	24CB406P	Software Design with UML Lab	-	-	2	1	-	25	25	50	-
10.	AEC	24CB407T	Business Communication & Value Science – III	2	-	-	2	10	10	30	50	1.5
11.	IKS	24CB408T	Indian Knowledge System	2	-	-	2	10	10	30	50	1.5
12	MDM	24CB431M	Multidisciplinary Minor - II	3	-	-	3	20	20	60	100	3
			Total	21	0	6	24	120	195	435	750	

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COMPUTER SCIENCE AND BUSINESS SYSTEMS

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation		
						MSE	CA	ESE	Total
24CB401T	Operating Systems	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. 1To provide fundamental understanding of operating system concepts, structure, and services. 2. To familiarize students with processes, threads, CPU scheduling and their role in efficient system operation. 3. To study classical process synchronization problems and inter-process communication mechanisms. 4. To explain memory management techniques, including paging, swapping, fragmentation, and virtual memory. 5. To explore disk management, file systems, and storage structures used in modern operating systems.	1. Explain the purpose, structure, and functions of an operating system. 2. Analyze process management, threading concepts, and CPU scheduling algorithms. 3. Apply synchronization mechanisms to solve classical IPC and deadlock-related problems. 4. Describe various memory management techniques, including paging, fragmentation, and virtual memory. 5. Examine disk scheduling algorithms and file system architectures used for storage management.

Unit I : **[9 Hrs]**

Introduction : Concept of operating system ,user view ,system view , Computer System organization, Bootstrap Program ,Storage Structure , Types of Operating Systems,

Operating System Structure: Monolithic, Layered, Micro kernel, Exokernel. Operating System services, User and Operating system Interfaces: Command interpreters, Graphical User Interface. System calls ,Types of system call, System Programs

Unit II : **[10 Hrs]**

Process Definition , Process in memory, Process State, Process Control block(PCB), Operation on Process, context switching

Threads: Definition, Benefits of Threads, Types of Threads, Different state of thread.

Process Scheduling: Scheduling Objective, CPU – I/O burst Cycle, CPU Scheduler: Types of scheduler, Scheduling criteria.

Scheduling Algorithms: Pre-emptive and Non Preemptive, FCFS, SRTF, Priority, RR.

Unit III : **[9 Hrs]**

Critical Section problem, Race condition, Peterson solution, Semaphores. Classic problem IPC Problem: Producer Consumer Problem, ReaderWriter Problem. , The Dinning _ philosophers Problem.

Deadlocks: System model, Deadlock characterization, Methods of handling deadlocks, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock Detection and recovery.

Unit IV : **[9 Hrs]**

Memory Management: Basic concepts , logical and physical address mapping **,**Swapping

Memory Allocation -Contiguous Memory Allocation - fixed partition and Variable partition,

Fragmentation : Internal and External Fragmentation

Paging: Basic method, paging model for logical and physical memory, paging hardware with TLB, Advantage and disadvantage of paging.

Unit V : **[9 Hrs]**

Virtual Memory Management: Basic of Virtual Memory ,Demand paging ,Page Replacement Algorithm : FIFO ,LRU, Optimal

Disk Management : Disk Structure , **File System :**File concepts ,File attributes, File operations, File Types .File Access Method : sequential Access , Direct access

Text Books

S.N	Title	Authors	Edition	Publisher
1	Operating System Concepts	A. Silberschatz, Peter B. Galvin, Grag Gagne	8th edition	

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Operating System	A.Godbole	3rd Edition	The McGraw-Hill

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CB401P	Operating System Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. Make the students familiar with the basics of Operating system 2. Introduce the notion of process, various features of process, CPU scheduling algorithm. 3.To examine several classical process–synchronization problems 4. To explain the concept of memory management, paging, virtual memory management, and page replacement algorithm 5.To explore disk management and function of file systems	1. Use and apply fundamental UNIX and DOS commands to perform basic OS-level operations. 2. Implement process and thread management techniques and understand their lifecycle. 3. Simulate CPU scheduling algorithms such as FCFS, SJF, SRTF, RR, LJF, and LRTF. 4. Develop programs for memory and page replacement techniques, including FIFO and LRU. 5. Apply and simulate deadlock avoidance/detection and disk scheduling algorithms like Banker's, FCFS, and SSTF.

Expt. No.	Title of the experiment
1	Basics of UNIX commands and DOS Commands.
2	Implementation of Process and thread (Life cycle of process) (i) Process creation and Termination; (ii) Thread creation and Termination
3	Implementation of CPU Scheduling. (i) FCFS, (ii) SJF, (iii) Shortest Remaining Time First and
4	Implementation of CPU Scheduling: (i) Round Robin (ii) Longest Job First and (iii) Longest Remaining Time First (LRTF)
5	Write a C program to simulate Bankers Algorithm for Deadlock Avoidance.
6	Write C programs to simulate Page Replacement Algorithms: FIFO, LRU.
7	Write C programs to simulate implementation of Disk Scheduling Algorithms: FCFS, SSTF.
8	Write a C program to simulate Bankers Algorithm for Deadlock Detection.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Operating System Concepts	A. Silberschatz, Peter B. Galvin, Grag Gagne	8th edition	

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Operating System	A.Godbole	3rd Edition	The McGraw-Hill

ARISE & SHINE

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CB402T	Introduction to Innovation, IP Management & Entrepreneurship	2	-		2	10	10	30	50

Course Objectives	Course Outcomes
1. To develop an understanding of innovation as a core business process and enhance students' creative and innovative thinking abilities. 2. To provide foundational knowledge of entrepreneurship, including opportunity recognition, entry strategies, and financial planning for new ventures. 3. To introduce the fundamentals of Intellectual Property Rights (IPR) and their importance in protecting innovations and maintaining competitive advantage.	CO1: Explain key concepts of innovation and evaluate different approaches used for developing innovative products and services. CO2: Analyze entrepreneurial processes, including identifying business opportunities and preparing basic financial plans for startups. CO3: Identify and apply different types of Intellectual Property Rights (IPR) to protect innovations and business assets.

Unit I **[10 Hrs]**

Innovation: What and Why?
Innovation as a core business process, Sources of innovation, Knowledge push vs. need pull innovations.
Class Discussion- Is innovation manageable or just a random gambling activity?
Building an Innovative Organization
Creating new products and services, exploiting open innovation and collaboration, Use of innovation for starting a new venture
Class Discussion- Innovation: Co-operating across networks vs. 'go-it-alone' approach

Unit II **[10 Hrs]**

Entrepreneurship: Opportunity recognition and entry strategies, Entrepreneurship as a Style of Management, Maintaining Competitive Advantage- Use of IPR to protect Innovation
Entrepreneurship- Financial Planning: Financial Projections and Valuation, Stages of financing, Debt, Venture Capital and other forms of Financing

Unit III **[10 Hrs]**

Intellectual Property Rights (IPR): Introduction and the economics behind development of IPR: Business Perspective
IPR in India – Genesis and Development, International Context, Concept of IP Management, Use in marketing
Types of Intellectual Property: Patent- Procedure, Licensing and Assignment, Infringement and Penalty
Trademark- Use in marketing, example of trademarks- Domain name, Geographical Indications- What is GI, why protect them?
Copyright- What is copyright, Industrial Designs- What is design? How to protect?
Class Discussion- Major Court battles regarding violation of patents between corporate companies, How to file.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Managing Innovation: Integrating Technological, Market and Organizational Change	Joe Tidd, John Bessant	4th Edition,2009	John Wiley & Sons, Ltd

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COMPUTER SCIENCE AND BUSINESS SYSTEMS

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CB403T	Operations Research	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. To introduce the methodology of Operations Research and develop skills to formulate and solve linear programming problems. 2. To build the ability to model and analyze transportation problems and apply appropriate solution techniques. 3. To provide foundational knowledge of game theory, assignment problems, and their applications in decision-making. 4. To equip students with project management techniques such as PERT, CPM, and crashing for effective planning and scheduling.	1. Apply Operations Research methods and linear programming techniques to solve real-world optimization problems. 2. Evaluate transportation and assignment models and derive optimal solutions for practical scenarios. 3. Use project scheduling tools such as PERT and CPM to determine critical paths, estimate project duration, and analyze time–cost trade-offs.

Unit I : Introduction to OR and LPP **[10 Hrs]**

Origin of OR and its definition, Types of OR problems, Phases of OR problem approach – problem formulation, buildingmathematical model, deriving solutions, validating model, controlling and implementing solution.

Linear programming- Implicit assumptions of LPP, Linear algebra – Vectors, Matrices, Linear Independence/Dependence of vectors, Rank, Basis, System of linear eqns., Hyper plane, Extreme points, Basic feasible solutions.

Simplex Algorithm – slack, surplus & artificial variables, computational details, big-M method, Duality – formulation, results, fundamental theorem of duality, dual-simplex and primal dual algorithms.

Unit II : Transportation and Assignment problems **[10 Hrs]**

TP-decision variables, supply & demand constraints, formulation, Balanced & unbalanced situations, Solution methods – NWCR, minimum cost and VAM, test for optimality (MODI method)

AP - decision variables, constraints, formulation, Balanced &unbalanced situations, Solution method – Hungarian, test for optimality (MODI method)

Unit III : **[10 Hrs]**

Project definition, Project scheduling techniques – Gantt chart, PERT & CPM, Determination of critical paths, Estimationof Project time and its variance in PERT using statistical principles, Concept of project crashing/time-cost trade-off.

Queuing Theory – queue (waiting line), waiting costs, characteristics (arrival, queue, service discipline) of queuing system, queue types (channel vs. phase).

Kendall's notation, Little's law, steady state behavior, M/M/1 Model and its performance measures.

Text Books

S.N	Title	Authors	Edition	Publisher
1	**Operations Research: An Introduction.**	**H.A. Taha**	10th Edition	Pearson
2	**Linear Programming.**	**K.G. Murthy**	5th Edition	John Wiley & Sons

Reference Books

S.N	Title	Authors	Edition	Publisher
1	**Linear Programming.**	**G. Hadley.**	2nd Edition	Addison –Wesley Publishing house
2	**Introduction to Operations Research**	**F.S. Hiller and G.J.**	9th Edition	Mc Graw Hill

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CB404T	Marketing Research & Marketing Management	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. To introduce students to the core concepts of Marketing Management and the role of marketing in both product and service sectors. 2. To develop an understanding of marketing strategies, including the marketing mix, product lifecycle, branding, pricing, promotion, and distribution. 3. To equip students with foundational knowledge of Marketing Research, including research techniques, questionnaire design, and data analysis.	1. Explain key marketing concepts and apply segmentation, targeting, and positioning strategies in various market contexts. 2. Analyze and apply marketing mix components, including product strategies, pricing policies, promotional tools, and distribution channels. 3. Use basic marketing research techniques such as survey design, statistical data analysis, and interpretation for informed marketing decisions.

Unit I Marketing Concepts and Applications **[10 Hrs]**

Introduction to Marketing & Core Concepts, Marketing of Services, Importance of marketing in service sector.
Marketing Planning & Environment: Elements of Marketing Mix, Analyzing needs & trends in Environment - Macro, Economic, Political, Technical & Social, Understanding the consumer: Determinants of consumer behavior, Factors influencing consumer behavior ,Market Segmentation: Meaning & Concept, Basis of segmentation, selection of segments, Market Segmentation strategies, Target Marketing, Product Positioning, Social Marketing- Sustainability & Ethical Marketing.

Unit II Product Management , Pricing, Promotion and Distribution Strategy **[10 Hrs]**

Product Life cycle concept, New Product development & strategy, Stages in New Product development, Product decision and strategies,Branding & packaging,Policies & Practices – Pricing Methods & Price determination Policies. Marketing Communication – The promotion mix, Advertising & Publicity, 5 M's of Advertising Management. Marketing Channels, Retailing, Marketing Communication, Advertising, Influencer Marketing & Content Strategy.

Unit III Marketing Research **[10 Hrs]**

Introduction, Type of Market Research, Scope, Objectives & Limitations; Marketing Research Techniques, Survey Questionnaire design & drafting, Pricing Research, Media Research, Qualitative Research, Data Analysis: Use of various statistical tools – Descriptive & Inference Statistics, Statistical Hypothesis Testing, Multivariate Analysis - Discriminant Analysis, Cluster Analysis, Segmenting and Positioning, Factor Analysis, Planning for Internet Marketing, AI-based Consumer Analytics (basics)
Business to Business Marketing: Fundamental of business markets. Organizational buying process. Business buyer needs. Market and sales potential. Product in business markets. Price in business markets. Place in business markets. Promotion in business markets. Relationship, networks and customer relationship management. Business to Business marketing strategy, Conspicuous consumption (GenZ)

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Marketing Management	R. S. N. Pillai & Bhagwati	I	S. Chand
2.	Marketing Management	K. Karunakaran	I	Himalaya Publishers
3.	Final Book on Marketing Management	Ashok Bansal	I	Himalaya Publishers
4.	Marketing Management	Phillip Kotler & K L Keller	I	Pearson India

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits		Evaluation		
						MSE	CA	ESE	Total
24CB405T	Database Management Systems	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
This course is intended : 1. To understand the fundamental concepts of database systems, data models, and DBMS architecture. 2. To develop skills in data modeling using ER/EER techniques and designing efficient relational schemas. 3. To apply relational algebra and SQL/PL-SQL commands for data definition, manipulation, and complex query processing. 4. To analyze normalization, query optimization, transaction processing, concurrency control, and recovery mechanisms for reliable database design. 5. To explore and evaluate database security models, NoSQL databases, distributed systems, cloud databases, and modern data management technologies.	**Students will be able to** 1. Explain core concepts of database systems, data models, DBMS architecture, and ER/EER modeling. 2. Apply relational algebra operations and SQL/PL-SQL constructs for data definition, manipulation, and retrieval. 3. Analyze functional dependencies and perform normalization to design efficient, consistent, and optimized relational schemas. 4. Evaluate transaction processing, concurrency control mechanisms, deadlock handling, and database recovery techniques. 5. Explore and compare database security models, NoSQL systems, distributed databases, and advanced data management technologies.

Unit I :	**[10 Hrs]**
Introduction to Databases, characteristics, advantages, DBMS vs File system. Database architecture: 3-level architecture, data abstraction, data independence. Data models: Hierarchical, Network, Relational and Object-oriented models. ER Model: Entity types, relationships, attributes, keys, ER diagrams. Enhanced ER (EER): Specialization, generalization, aggregation.	
Unit II :	**[9 Hrs]**
Relational Model Concepts. Relational Algebra: Selection, projection, joins, division, union, intersection. Integrity constraints: Primary key, foreign key, domain, referential constraints. SQL: DDL, DML, DCL, TCL. Advanced SQL: Joins, subqueries, nested queries, views, indexes, triggers. PL/SQL basics: Procedures, functions, cursors.	
Unit III :	**[9 Hrs]**
Functional dependencies, attribute closure. Armstrong's axioms. Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF. Lossless and dependency-preserving decomposition. Query processing: RA expression evaluation, join strategies. Query optimization techniques.	
Unit IV :	**[9 Hrs]**
Storage and file organization: Heap, sequential, hashing. Indexing: B-tree and B+ tree indexing. Transaction processing: ACID properties. Concurrency control: Lock-based, timestamp-based protocols, MVCC. Deadlocks: Detection, prevention, recovery. Database recovery techniques: Checkpoints, log-based recovery.	
Unit V :	**[9 Hrs]**
Database security: Authentication, authorization, access control. Security models: DAC, MAC, RBAC. SQL injection and intrusion detection. NoSQL databases: Key-value, document, columnar, graph databases. CAP theorem, BASE properties. Distributed databases, cloud databases, data warehousing & OLAP.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Database System Concepts	Abraham Silberschatz, Henry F. Korth and S. Sudarshan	10th	McGraw-Hill Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Principles of Database and Knowledge – Base Systems	J. D. Ullman	7th	McGraw-Hill, Inc
2	Fundamentals of Database Systems	R. Elmasri and S. Navathe	3rd	Pearson Education
3	Foundations of Databases	Serge Abiteboul, Richard Hull, Victor Vianu	5th	Addison-Wesley

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CB405P	Database Management Systems Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended 1. To Understand DDL and DML Commands 2. To design and implement databases with various constraints 3. To query and filter data from a database 4. To Aggregating Data with Functions 5. apply Advanced SQL Techniques	Students will be able to 1. Apply DDL and DML Commands 2. Implement database constraints 3. Find competency in using SQL clauses 4. Understand and apply Aggregate functions 5. Understand SQL injection and its prevention

Expt. No.	Title of the experiment
1	To study Data Definition Language (DDL) and Data Manipulation Language (DML) Commands in SQL.
2	To apply DDL and DML Commands on the created database.
3	To study and apply commands that involves Constraints (PRIMARY KEY, UNIQUE, NOT NULL, CHECK).
4	To study and apply LIKE, AND, BETWEEN, NOT BETWEEN, IN and NOT IN clause on the created database.
5	To study and apply Aggregate functions (Count, Sum, Avg, Min, Max) on the created database.
6	To study and apply SQL Joins (INNER JOIN, LEFT JOIN and RIGHT JOIN) on the created database.
7	To study and implement the concept of SQL working with Dates.
8	To study and apply Index creation through SQL.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Database System Concepts	Henry F. Korth, Abraham Silberschatz, S.Sudar	10TH	Mcgraw Hill Educ

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Learning SQL	Alan Beaulieu	3RD	O'Reilly Publications
2	The Art of SQL	Stephane Faroult, Peter Robson	5TH	O'Reilly Med

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CB406T	Software Design with UML	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. To develop the ability to model and analyze software requirements using UML use-case diagrams and class notations. 2. To enable students to design object-oriented software architectures using UML structural and behavioral diagrams such as class, object, sequence, and package diagrams. 3. To introduce design patterns and Java implementation concepts for creating effective and reusable object-oriented designs.	After completing this course, students will be able to: 1. Explain and apply object-oriented modeling concepts using appropriate UML diagrams. 2. Identify, model, and document system requirements and translate them into OO design models. 3. Apply design patterns and UML modeling principles to create efficient, modular, and reusable software designs.

Unit I : Introduction to the UML Language	**[10 Hrs]**
Elements of the language, General description of various models, The process of Object Oriented software development, Description of Design Patterns. **Requirements Analysis Using Case Modeling** Actor definitions, Writing a case goal., Use Case Diagrams, Use Case Relationships.	
Unit II : Transfer from Analysis to Design in the Characterization Stage	**[10 Hrs]**
Interaction Diagrams- Description of goal, Defining UML Method, Operation, Object Interface, Class. **The Static Structure Diagrams-** The Class Diagram Model, Attributes descriptions, Operations descriptions, Connections descriptions in the Static Model.	
Unit III : Package Diagram Model.	**[10 Hrs]**
Description of the model, White box, black box, Connections between packagers, Interfaces ,Create Package Diagram, Drill Down **State Diagram / Activity Diagram-** Description of the State Diagram, Events Handling, Description of the Activity Diagram **Component Diagram Model-** Physical Aspect, Logical Aspect, Connections and Dependencies, User face	

Text Books

S.N	Title	Authors	Edition	Publisher
1	The Unified Modelling Language User Guide.	Grady Booch, James Rumbaugh, Ivar Jacobson,		Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	*Object-Oriented Software Engineering: using UML, Patterns, and Java.*	Bernd Bruegge and Allen H. Dutoit		
2	*Design Patterns: Elements of Reusable Object-Oriented Software*.	Erich Gamma, Richard Helm Ralph Johnson, and John M Vlissides.		

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CB406P	Software Design with UML Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. To develop the ability to create requirement models using UML use-case diagrams and class notations based on user requirements. 2. To enable students to design object-oriented system architectures using UML structural and behavioral diagrams such as class, object, and sequence diagrams. 3. To build foundational understanding of Java implementation concepts related to translating UML designs into functional software. 4. To introduce students to design patterns and demonstrate their application in object-oriented system design. 5. To develop the skill to evaluate OO designs using design heuristics, patterns, and established modeling guidelines.	After completing the lab, students will be able to: 1. Explain and apply UML concepts for modeling object-oriented systems. 2. Identify and document software requirements using appropriate UML diagrams. 3. Create UML-based structural and behavioral models including class, use-case, sequence, and activity diagrams. 4. Analyze and apply design patterns to improve the quality and flexibility of software design. 5. Implement UML design solutions using Java and apply structural patterns to solve design problems.

Expt. No.	Title of the experiment
1	To implement the different UML diagram along with diagrammatic representation.
2	Implement Package diagram model and dynamic model in UML.
3	To Install Star UML Software and draw the Use case diagram of Banking System.
4	Demonstrate the class diagram of Banking System of Bank System ALong with their Operations in UML.
5	To Implement the Object diagram in Star UML software.
6	Draw the Activity diagram of Library system in UML.
7	Demonstrate the Concept the Component Diagram Model in UML .
8	To illustrate the concept of Deployment model in UML.

Text Books

S.N	Title	Authors	Edition	Publisher
1	*The Unified Modelling Language User Guide.*	Grady Booch, James Rumbaugh, Ivar Jacobson,		Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	*Object-Oriented Software Engineering: using UML, Patterns, and Java.*	Bernd Bruegge and Allen H. Dutoit		Pearson Education
2	*Design Patterns: Elements of Reusable Object-Oriented Software*.	Erich Gamma, Richard Helm, Ralph Johnson, and John M. Vlissides.		Pearson Education

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CB407T	Business Communication & Value Science – III	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. To strengthen students' communication abilities through effective writing, logical reasoning, and professional correspondence skills. 2. To build emotional intelligence and interpersonal skills essential for personal and professional settings. 3. To develop awareness about workplace values, including diversity, corporate social responsibility (CSR), leadership, and time management.	After completing this course, students will be able to: 1. Demonstrate effective communication skills through improved writing, reasoning, and social correspondence. 2. Apply emotional intelligence and conflict-management strategies in real-life and workplace scenarios. 3. Recognize and practice key professional values, including CSR, diversity, leadership, and time management.

UNIT I LEXICAL REASONING **[10 Hrs]**

Establishing Associations – Verbal Analogy – Logical Reasoning – Reasoning and Assertions – Cloze test – Single word Substitute – Creating and launching E-magazine – Common Errors– Report Writing

UNIT II SOCIAL CORRESPONDENCE **[10 Hrs]**

Importance of Corporate Social Responsibility (CSR) – Professional Ethics – Organisational Structure in Workplace – Developing Leadership Qualities

ART OF NETWORKING- Brain Storming Session – Discussing and Exploring the means of articulating and amplifying the Social issue their NGOs are working for – Addressing a Multitude – Welcome Address – Vote of Thanks – Public Speaking

UNIT III CRITICAL THINKING **[10 Hrs]**

Learn Values from Movies – Film on Diversity – Discussion on key take away of the film – Mind Mapping – Conflict Management– Case Study – Time Management

LISTENING SKILLS-
Listening to Product Description-Listening to Inspirational speech – Listening Comprehension – Critical Review-Book / Movie Review – Comparative Analysis

Text Books

S.N	Title	Authors	Edition	Publisher
1	,"Development of Life Skills and Professional Practice"	Shalini Verma	1 st edition,	Vikas Publishing house Pvt. Ltd., 2014

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Abundance: "The Future is Better Than You Think",	Peter H. Diamandis and Steven Kotler	1 st edition,	Free Press, 2012
2	"Advertising & IMC: Principles and Practice",	Sandra Moriarty, Nancy D, William D Mitchell	10th edition	Pearson Education India, 2016.

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24CB408T	Indian Knowledge System	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. To introduce the origin, evolution, and foundational approach of the Indian Knowledge System (IKS). 2. To explore Indian knowledge approaches across domains such as language, environment, management, time, life, and mind. 3. To develop appreciation for Indian thought processes, reasoning, sustainability practices, and the rich knowledge sources from Vedic literature.	After completing this course, students will be able to: 1. Explain the evolution, scope, and significance of the Indian Knowledge System and recognize practices for conserving traditional knowledge. 2. Describe major Indian scholars, literature, and classical knowledge traditions across philosophy, science, medicine, arts, and culture. 3. Interpret ancient Indian practices and traditional systems related to resource conservation, agriculture, health, and sustainable living.

Unit I **[10 Hrs.]**

Introduction and Management of Indian Knowledge System

1.1 Definition, Concept and Scope of IKS
1.2 IKS based approaches on Knowledge Paradigms
1.3 IKS in Ancient India and Modern India
1.4 Documentation and Preservation of IKS
1.5 Approaches for Conservation and Management of nature and Bio – Resources
1.6 Approaches and Strategies to protection and conservation of IKS

Unit II **[10 Hrs.]**

IKS and Indian Scholars, Indian Literature

2.1 Philosophy and Literature (Maharshi Vyas, Kanad, Pingala, Parasar, Banabhatta, Nagarjuna and Panini)
2.2 Mathematics and Astronomy (Aryabhatta, Mahaviracharya, Bodhayan, Bhaskaracharya, Bramhagupta, Varahamihira)
2.3 Medicine and Yoga (Charak, Susruta, Maharshi Patanjali and Dhanwantari)
2.4 Sahitya (Vedas, Upvedas (Ayurveda, Dhanurveda, Ghandarvaveda), Puran and Upnishad and Shad Darshan (Vedanta, Nyay, Vaisheshik , Sankhya, Mimamsa, Yoga, Adhyatma, Meditation)
2.5 Shastra (Nyaya, Vyakarana, Krishi, Shilp, Vastu, Natya, Sangeet)

Unit III **[10 Hrs.]**

Unique Traditional Practices and Applied Traditional knowledge

3.1 Myths, Rituals, Spirituals, Folk stories, Traditional Narratives
3.2 Agriculture, Land, Water and Soil Conservation and Management Practices
3.3 Vaidya (Traditional health Care system), Amchi Medicine system

Text Books

S. N.	Title	Authors	Edition	Publisher
1	Indian Knowledge System: Introduction and Prospects	Acharya Shreyas Kurhekar	First	Sanskrit University,Ramtek
2	Indian Knowledge System Vol. I and II	Kapil Kapoor, Awadhesh Kumar Singh		D.K. Print World Ltd.
3	Traditional Knowledge System in India	Amit Jha		Atlantic Publisher

Reference Books / Resources

S. N.	Title	Authors	Edition	Publisher
1	Website of Indian Knowledge System Division,New Delhi			

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