





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 ENGINEERING (CYBER SECURITY)

Scheme of Examination - Third Semester

Sr No	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 Examination	End Sem Examination		
				1	BSC	24CS301T		Applied Mathematics - III	3	-		
2	PCC	24CS302T	Data Structures	3	-	-	3	20	20	60	100	3
3	PCC	24CS302P	Data Structures Lab	-	-	2	1	-	25	25	50	-
4	PCC	24CS303T	Operating System	3	-	-	3	20	20	60	100	3
5	PCC	24CS303P	Operating System Lab	-	-	2	1	-	25	25	50	-
6	PCC	24CS304T	Information Security Fundamentals	3	-	-	3	20	20	60	100	3
7	PCC	24CS305P	Basics of Ethical Hacking Lab	-	-	2	1	-	25	25	50	-
8	ELC	24CS306P	Micro Project - I	-	-	2	1	-	50	-	-	-
9	VEC	24CS307T	Value Education Course	3	-	-	3	20	20	60	100	3
10	MDM	24CS331M	MDM – I (Refer MDM Basket)	2	-	-	2	10	10	30	50	1.5
11	SEC	24CS341P	Career Development - III	-	-	2	1	-	50	-	50	-
Total				17	-	10	22	110	285	405	750	

 Chairman - BoS	 Dean – Academics	July 2025 Date of Release	1.0 Version	Applicable for 2025-26
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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS301T	Applied Mathematics-III	3	-	-	3	40	60	100

Course Objectives	Course Outcomes
<p>The aim of this course is</p> <ul style="list-style-type: none">To introduce the essential concepts of Numerical methodsTo familiarize the students with concepts statistics.To provide general understanding of cyber security relationship with numbers.	<p>Students will be able to</p> <ul style="list-style-type: none">To compute with integers modulo n, and understand congruence classes, division algorithms, Euler's theorem, and possibly the Chinese Remainder TheoremAnalyze and solve system of linear equations by Numerical methods.Solve various ordinary differential equation by Numerical methods.Apply various concepts of vector spaces.Use statistical methods and tools in engineering problems.
Unit I	[9Hrs]
Analytic Number theory: Euclid's Lemma, Euclidean algorithm, basic properties of congruences, residue classes and complete residue system, Euler Fermat theorem, Lagrange's theorem and its applications, Chinese remainder theorem, primitive roots.	
Unit II	[9Hrs]
NUMERICAL METHODS I: Solution of Algebraic and Transcendental Equations: Method of False Position, Newton-Raphson method, Solution of system of simultaneous linear equations: Crout's method and Gauss Seidel method,	
Unit III	[9Hrs]
NUMERICAL METHODS II: Numerical solution of ordinary differential equation: Taylor's series method, Runge-Kutta 4th order method. Euler's modified method, Milne's Predictor-Corrector method, Largest Eigen value and Eigen vector by Iteration method.	
Unit IV	[9Hrs]
Vector Space: Subspaces, Linear Dependence/Independence, Basis, Dimension, Linear transformation, Range Space and Rank, Null Space and Nullity, Rank nullity theorem, Matrix Representation of a linear transformation, Linear Operators on R^n	
Unit V	[9Hrs]
Statistics: Measures of central tendency, Mean, Median, Mode, Mean deviation, Standard deviation, Testing a hypothesis, Null hypothesis, Alternative hypothesis, t-test, F-test and Chi square test.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Linear Algebra and Its Application (Paperback)	Gilbert Strang	2007	Nelson Engineering
2	Introductory methods of Numerical Analysis	S.S.Sastri	2004	Prentice-Hall of India Pvt.Ltd
3	Higher Engineering Mathematics	B.S. Grewal	40th Edition	Khanna Publication
4	Theory & problems of Probability and Statistics	Murray R. Spiegel		Schaum Series, Mc Graw Hills

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Advanced Engineering Mathematics	Erwin Kreyszig	8 th Edition	Wiley India
2	Higher Engineering Mathematics	H.K Dass & Er. Rajesh		S. Chand Publication.

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Chairman - BoS	Dean - Academics	Date of Release	Version	

**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS302T	Data Structures	3	-	-	3	40	60	100

Course Objectives	Course Outcomes
<p>This course is intended to provide:</p> <ul style="list-style-type: none"> ● Explain the fundamental concepts of data structures, algorithms, and their performance analysis. ● Develop and implement efficient algorithms using various data structures such as arrays, linked lists, stacks, queues, trees, and graphs. ● Analyze time and space complexity using asymptotic notations for algorithm comparison. ● Apply appropriate searching, sorting, and data manipulation techniques in problem-solving. ● Utilize linear and nonlinear data structures to solve real-life computational problems efficiently. 	<p>Student will be able to:</p> <ul style="list-style-type: none"> ● Describe the concept, classification, and applications of data structures and algorithm complexity. ● Apply searching and sorting algorithms to solve basic data organization and retrieval problems ● Implement and manipulate linear data structures like linked lists, stacks, and queues in static/dynamic memory. ● Construct and traverse trees and binary search trees using different representations and applications. ● Represent graphs using suitable data structures and implement traversal algorithms and shortest path solutions.

Unit I**[8 Hrs]****Introduction:** - Concept and applications of Data structures, Time and space analysis of algorithms, Asymptotic Notations.**Searching and sorting techniques-** Linear search, Binary search, Indexed search, Insertion sort, selection sort, Bubble Sort, Radix Sort, Merge Sort, Quick Sort.**Unit II****[8 Hrs]****Linked Lists :** Singly linked list, Implementation of linked list using static and dynamic memory allocation, operations on linked list, polynomial representations and manipulations are using linked list, circular linked list, doubly linked list, Generalized list, sparse matrix.**Unit III****[7 Hrs]****Stack and Queue -** Array representation of stacks, Implementation of stack using linked lists, Queues ,Dequeue, Circular queue, Polish notation, Application of stack & queue: Conversion from Infix to Postfix ,Evaluation of postfix expressions, Priority Queues.**Unit IV****[7 Hrs]****Trees:** Basic Terminology, Basic trees, Binary tree representations, threaded storage representation, binary tree traversals, binary search trees, Application of trees, Preliminary treatment of AVL Trees.**Unit V****[6 Hrs]****Graphs:** Definition & terminology, Graph representation: matrix representation of Graph, List of structure, other representation of graphs, Breadth First Search, Depth First Search, Spanning trees, Shortest path algorithm, Topological sorting.**Text Books**

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Data Structure	Horowitz and Sahani	Second	CBS Publications
2	Data Structures using C	Tanenbaum	Third	C Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Data Structure and Program Design in C	Kruse, Leung and Tondo	Second	PHI
2	Schaum's outline: Data Structures	Seymour Lipschutz	Third	Tata Mc Graw Hill

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS302P	Data Structures Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
<p>This course is intended to provide</p> <ul style="list-style-type: none"> Apply basic C programming constructs such as arrays and structures. Implement and evaluate searching and sorting algorithms using procedural programming. Design and implement linear data structures (Stacks, Queues, Linked Lists) using static and dynamic memory. Implement non-linear data structures (Trees and Graphs) including traversal, insertion, deletion, and search operations. Apply algorithmic logic to solve computational problems involving both linear and non-linear data structures. 	<p>Student will be able to:</p> <ul style="list-style-type: none"> Design and implement programs using arrays, structures, and basic searching and sorting algorithms to solve computational problems. Apply and demonstrate the use of linear and non-linear data structures such as stacks, queues, and linked lists using C programming. Construct and implement tree and graph algorithms including traversal, insertion, deletion, and search techniques to solve real-world problems.

Exp No	Name of Experiment	CO
1	To design and implement basic C program using arrays & structures.	1
2	To implement a Menu driven program for linear & Binary search methods and demonstrate their constraints.	1
3	To implement a Menu driven program for Sorting methods.	1
4	To implement a Program to demonstrate the working of a Stack.	2
5	To implement a Program to demonstrate the working of a Queue.	2
6	To implement a Program to apply the concepts of linked list.	2
7	To implement the non- linear data structure binary tree.	3
8	To implement BFS and DFS in graph	3
9	To implement tree traversal operations (ie. In-order, Pre-order and Post-order) on binary tree.	3
10	To perform insertion and deletion operations on AVL Tree	3

Text Books

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Data Structure	Horowitz and Sahani	Second	CBS Publications
2	Data Structures using C	Tanenbaum	Third	C Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Data Structure and Program Design in C	Kruse, Leung and Tondo	Second	PHI
2	Schaum's outline: Data Structures	Seymour Lipschutz	Third	Tata Mc Graw Hill

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS303T	Operating System	3	-	-	3	40	60	100

Course Objectives	Course Outcomes
<p>This course is intended</p> <ul style="list-style-type: none"> Make the students familiar with the basics of Operating system Introduce the notation of process, various features of process, CPU scheduling algorithm Discuss the goal and principles of system protection & Security in modern computer system 	<p>Students will be able to</p> <ul style="list-style-type: none"> Understand the fundamental concepts, architecture, and functions of operating systems and system calls. Demonstrate knowledge of processes, threads, process scheduling, and inter-process communication. Analyze and evaluate various CPU scheduling and synchronization techniques used in modern systems. Identify causes of deadlocks and apply prevention, avoidance, detection, and recovery techniques. Compare and implement memory management techniques including paging, segmentation, and virtual memory.

Unit I	[8Hrs]
Introduction and System Structures - OS overview, objectives, types (batch, time-sharing, real-time, distributed, parallel), OS services, system calls, Computer system operation, I/O structure, OS structure models: simple, layered, microkernel, virtual machine	
Unit II	[8Hrs]
Process and Thread Management - Process concept, states, PCB, Process scheduling algorithms: FCFS, SJF, Priority, Round Robin, Threads: Definition, need for threads, Differences, advantages, limitations, user vs. kernel threads, multithreading models : Many-to-One, One-to-One, Many-to-Many, Thread Libraries (POSIX Threads, Java Threads), Inter-process communication (IPC).	
Unit III	[8Hrs]
CPU Scheduling: Introduction to Scheduling, Scheduling criteria, Scheduling Algorithms, Algorithm Evaluation and Scheduling in different Systems Process Synchronization Synchronization Hardware, Semaphores, and Classical Problem of Synchronization,	
Unit IV	[8Hrs]
Introduction to Deadlocks: Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery. Memory Management: Single Contiguous Memory Management, Fixed Partition	
Unit V	[8Hrs]
Memory Management: Introduction, Allocation Algorithm, swapping, relocation and address translation Variable Partition: Introduction, Allocation Algorithm, swapping, relocation and address translation, Non-contiguous Allocation -general concepts , Paging, Segmentation Virtual Memory Management system: general concepts, Page replacement algorithm: First in First Out (FIFO), Least Recently used (LRU), and Optimal.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Operating System	A.Godbole	3 rd Edition	The McGraw-Hill.
2	Operating systems: Internals & design principles	William Stallings,	7 th Edition	Pearson

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Operating System Concepts	Silberschatz, Galvin	8 or 10 th edition	Wiley

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS303P	Operating System Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
<p>This course is intended</p> <ul style="list-style-type: none"> Hands-on experience with OS concepts: process, synchronization, memory, file management. Develop skills in system call programming and debugging. Understand OS security through practical tasks. 	<p>Students will be able to</p> <ul style="list-style-type: none"> Implement process creation, process states, and CPU scheduling techniques to understand process management in operating systems. Apply synchronization mechanisms like semaphores to solve concurrency problems such as producer-consumer and readers-writers. Simulate deadlock conditions and memory management strategies using resource allocation graphs and paging algorithms. Perform file and directory operations using system calls and manage permissions to ensure secure file access. Develop simple shell environments and user authentication mechanisms to demonstrate basic OS security and command interpretation.

Expt. No.	Title of the experiment
1	Process Creation and States: Create multiple processes using fork () and demonstrate process states.
2	CPU Scheduling Algorithms: Implement FCFS, SJF, Round Robin, and Priority scheduling
3	Producer-Consumer Problem: Solve using semaphores
4	Readers-Writers Problem: Implement synchronization for readers and writers.
5	Deadlock Detection and Recovery: Simulate resource allocation and deadlock handling
6	Paging and Page Replacement: Implement paging and simulate FIFO and LRU algorithms
7	File Operations: Use system calls to create, read, write, and delete files.
8	Directory and Permission Handling: Implement directory operations and modify file permissions
9	User Authentication: Simulate user authentication with password verification
10	Simple Shell: Develop a simple shell program to execute user commands

Text Books

S.N	Title	Authors	Edition	Publisher
1	Operating System Concepts – 10th Edition	Abraham Silberschatz, Peter B. Galvin, Greg Gagne	10th	Wiley
2	Operating Systems – 4th Edition	William Stallings	4th	Pearson

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Modern Operating Systems – 4th Edition	Andrew S. Tanenbaum, Herbert Bos	4th	Pearson
2	Operating Systems: A Concept-Based Approach – 2nd Edition	D. M. Dhamdhare	2nd	McGraw-Hill Education

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS304T	Information Security Fundamentals	3	-	-	3	CA	ESE	Total
						40	60	100

Course Objectives	Course Outcomes
<p>This course is intended to provide</p> <ul style="list-style-type: none"> Introduce the basic concepts of information security, threats, and vulnerabilities. Provide fundamental knowledge of cryptography and security mechanisms. Familiarize students with authentication, access control, and network security essentials. Lay the foundation for advanced security topics in subsequent semesters. 	<p>Upon completion, students will be able to:</p> <ul style="list-style-type: none"> Explain security goals and identify cyber threats and attacks. Apply cryptographic techniques and hash functions for secure communication. Compare authentication methods, access controls, and security protocols. Analyze network security tools like firewalls, IDS/IPS, TLS/SSL, and email/wireless protocols. Identify risks in apps, cloud, and IoT; explore AI trends in cybersecurity.
Unit I	[9 Hrs]
Introduction to Information Security: Definitions of information security, cyber security, and data protection. Security Goals: Confidentiality, Integrity, Availability (CIA). Threats & Attacks: Malware, Phishing, DoS, Social Engineering. Risk Management: Vulnerability assessment, Penetration Testing. Security Mechanisms & Policies: Defense-in-Depth, Zero Trust Model.	
Unit II	[10 Hrs]
Basics of Cryptography: Introduction to Cryptography & Security Services. Classical Cryptographic Techniques: Caesar Cipher, Vigenère Cipher, Play fair Cipher. One-Time Pad & Substitution Techniques. Introduction to Modern Symmetric Cryptography (AES, DES). Hash Functions: MD5, SHA-1, SHA-256.	
Unit III	[9 Hrs]
Authentication & Access Control: Authentication Mechanisms: Passwords, Multi-Factor Authentication (MFA), Biometric Systems. Access Control Models: Discretionary Access Control (DAC), Mandatory Access Control (MAC), Role-Based Access Control (RBAC). Security Tokens & Smart Cards. Authentication Protocols: Kerberos, CHAP, OAuth.	
Unit IV	[9 Hrs]
Network Security Fundamentals: Introduction to Network Security & Secure Communication. Firewalls & Intrusion Detection Systems (IDS/IPS). Transport Layer Security (TLS), Secure Sockets Layer (SSL). Wireless Security Protocols: WPA2, WPA3, WEP. Email Security: PGP, S/MIME.	
Unit V	[8 Hrs]
Application Security & Future Trends: Security in Web Applications: SQL Injection, Cross-Site Scripting (XSS), CSRF. Cloud Security Concepts: Data Encryption, Identity Management, Shared Responsibility Model. IoT Security Basics: Device Authentication, Secure Firmware Updates. Artificial Intelligence in Cyber security: Threat Detection, Behavior Analysis.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Applied Cryptography: Protocols, Algorithms, and Source Code in C	Bruce Schneier	II Edition	Wiley India Pvt ltd
2	Cryptography and Network Security: Principles and Practice	William Stallings	I Edition	Pearson

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Network Security and Cryptography	Bernard Menezes	-	Cengage Learning
2	Cryptography and Network Security	Berouz Forouzan	I	Tata Mc Graw Hill

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
						25	25	50
24CS305P	Basics of Ethical Hacking Lab	-	-	2	1			

Course Objectives	Course Outcomes
<p>This course is intended</p> <ul style="list-style-type: none"> Introduce the fundamentals of ethical hacking through hands-on exercises. Familiarize students with common vulnerabilities, attack vectors, and security tools. Develop practical skills in identifying, exploiting, and securing systems in a controlled environment. Instill ethical, legal, and responsible conduct in cyber security practices. 	<p>Students will be able to</p> <ul style="list-style-type: none"> Demonstrate the use of basic ethical hacking tools and techniques. Identify common vulnerabilities in systems and networks. Apply ethical hacking methodologies to test and secure systems. Understand the importance of ethics and legal compliance in cyber security.

Expt. No.	Title of the experiment
1	Introduction to Ethical Hacking and Lab Safety : Setting up a virtual lab environment (Kali Linux, Windows VM); understanding ethical guidelines.
2	Reconnaissance and Footprinting : Information gathering using Whois, nslookup, and Nmap; identifying open ports and services.
3	Scanning and Enumeration : Network scanning with Nmap/Zenmap; enumerating users, shares, and services.
4	Vulnerability Assessment : Using OpenVAS/Nikto to scan for system/web vulnerabilities
5	System Hacking Basics : Password cracking using John the Ripper/Hydra (on test systems); understanding password policies
6	Sniffing and Packet Analysis : Capturing and analyzing network traffic using Wireshark; identifying insecure protocols
7	Web Application Security Basics : Testing for SQL Injection, XSS on DVWA or OWASP Juice Shop; understanding input validation.
8	Social Engineering Awareness : Simulating phishing/social engineering in a safe environment; discussing defense mechanisms
9	Wireless Network Security : Scanning Wi-Fi networks, analyzing security settings, WPA2 handshake demonstration (no real cracking).
10	Reporting and Remediation : Documenting findings; suggesting remediation and best practices; responsible disclosure discussion

Text Books

S.N	Title	Authors	Edition	Publisher
1	Certified Ethical Hacker (CEH) Version 12: Certified Ethical Hacker Study Guide	Ric Messier	1 st	Sybex (an imprint of Wiley)
2	Ethical Hacking and Penetration Testing Guide	Rafay Baloch	1 st	CRC Press

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws	Dafydd Stuttard, Marcus Pinto	2 nd	Wiley
2	Hacking: The Art of Exploitation	Jon Erickson	2 nd	No Starch Press

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ES301T	Value Education Course	3	-	-	3	40	60	100

Course Objectives	Course Outcomes
<p>This course is intended</p> <p>Development of a holistic perspective through self-exploration and development of clarity about harmony between self, family, society and nature.</p>	<p>Students will be able to</p> <ul style="list-style-type: none"> Demonstrate awareness about self and their surroundings and its interdependence. Understand concepts of aspirations and happiness. Recognize and explain the nine universal values in relationship and their application in visualizing a harmonious society. Discuss concepts of conservation of nature and harmony and reusability. Identify the scope of eco-friendly systems for enriching institutions.
Unit I : Introduction	[9Hrs]
Purpose and motivation for the course, Self-Exploration–what is it? - Its content and process; ‘Natural Acceptance’ and Experiential Validation–as the process for self-exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations , Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority ,Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario , Method to fulfill the above human aspirations: understanding and living in harmony at various levels.	
Unit II : Understanding Harmony	[9Hrs]
Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’ , Understanding the needs of Self (‘I’) and ‘Body’ - happiness and physical facility , Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer) ,Understanding the characteristics and activities of ‘I’ and harmony in ‘I’ , Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail , Programs to ensure Sanyam and Health.	
Unit III : Values in relationships	[9Hrs]
Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship , Understanding the meaning of Trust; Difference between intention and competence , Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship , Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals , Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.	
Unit IV : Co-existing with nature	[9Hrs]
Understanding the harmony in Nature , Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature , Understanding Existence as Coexistence of mutually interacting units in all-pervasive space ,Holistic perception of harmony at all levels of existence. Include practice sessions to discuss human being as cause of imbalance in nature (film “Home” can be used), pollution, depletion of resources and role of technology etc.	
Unit V : Holistics approach for engineers	[9Hrs]
Natural acceptance of human values , Definitiveness of Ethical Human Conduct , Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order , Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems. , Case studies of typical holistic technologies, management models and production systems , Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations ,Sum up	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Human Values and Professional Ethics	Gaur, Sangal, Bagaria	2010	Excel Books, New Delhi

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Jeevan Vidya: Ek Parichaya	A. Nagaraj	1999	Jeevan Vidya Prakashan, Amarkantak
2.	Human Values	A.N. Tripathi	2004	New Age Intl. Publishers, New Delhi
3.	The Story of My Experiments with Truth	M.K.Gandhi	2009	Fingerprint! Publishers

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24CS331M	MDM - I	2	-	-	2	20	30	50

Course Objectives	Course Outcomes
<p>This course is intended</p> <ul style="list-style-type: none"> Learn fundamentals of application to network security. Understand network security threats, security services, and counter measures. Understand vulnerability analysis of network security. 	<p>Students will be able to</p> <ul style="list-style-type: none"> Analyze the network security services mechanism and methodology and evaluate various types of virus and trusted systems. Identify and design the various types of network architecture and Synthesis the protocols involved in network security. Identify and analyze the working of firewall and IDS.
Unit I	[10 Hrs]
Security Fundamentals:	
Introduction of Security, Security methodology, The three D's of Security, Five steps to better security, Network security model, Security goals, Security Services and mechanisms, Challenges to Network Security, Attacks, Viruses and related Threats, Taxonomy of malicious programs, Nature of Virus, Types of Virus.	
Unit II	[10 Hrs]
Network Architecture Fundamentals:	
Network Segments & Types, Perimeter Defense, Network Address Translation, Subnetting, Switching, and VLANs, Address Resolution Protocol and Media Access control, Introduction to handshake protocols, Record layer protocol, Internet Key Exchange protocol (IKE).	
Unit III	[10 Hrs]
Addressing and Firewall:	
IP addressing, Classes, Rules for assigning Host ID and Network ID, Introduction to IPSEC, Tunnel mode, Transport mode, Firewall: Need of Firewall, Firewalls - Design and Types of Firewalls, Personal Firewalls, IDS, Types of IDS, Responses of Intrusion Detection.	

Text Books

S. N	Title	Authors	Edition	Publisher
1	Applied Cryptography- Protocols, Algorithms and source code in "C"	Bruice Schneier	II Edition	Wiley India Pvt Ltd
2	Network Security and Cryptography	Bernard Menzees	I Edition	Cengage Learning

Reference Books

S. N	Title	Authors	Edition	Publisher
1	Cryptography and Network Security Principal and Practice	William Stalling	-	Pearson edition
2	Cryptography and Network Security	Berouz Forouzan	I	Tata Mc Graw Hill

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