K.L.N. COLLEGE OF ENGINEERING

Pottapalayam, Sivagangai District

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Estd: 1994

FOURTH SEMESTER

CURRICULUM AND SYLLABUS

REGULATIONS 2024

For Under Graduate Program

B.E. COMPUTER SCIENCE AND ENGINEERING

CYBER SECURITY

CHOICE BASED CREDIT SYSTEM

(For the students admitted from the academic year 2024-2025 onwards)

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM
(An Autonomous Institution, Affiliated to Anna University, Chennai)

VISION OF THE INSTITUTION

To become a Centre of Excellence in Technical Education and Research in producing Competent and Ethical professionals to the society

MISSION OF THE INSTITUTION

To impart Value and Need based curriculum to the students with enriched skill development in the field of Engineering, Technology, Management and Entrepreneurship and to nurture their character with social concern and to pursue their career in the areas of Research and Industry.

VISION OF THE DEPARTMENT

To develop competent professionals specialized in the field of cyber security through Quality education and research.

MISSION OF THE DEPARTMENT

To produce skilled cyber security professionals by leveraging technological advancements and research initiatives in collaboration with industry and society by inculcating innovative technical education and ethical principles.

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM

(An Autonomous Institution, Affiliated to Anna University, Chennai)

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: To Contribute effectively to the society by applying principles of Cyber security for analyzing the real world problems to produce optimal and sustainable technical solutions

PEO 2: To adapt an ever changing technologies by applying Engineering Principles

PEO 3: To build professionalism, team work, effective communication, ethical values and leadership qualities

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1. To develop data, resource and asset protection strategies for organizations, processes and peoples through cyber security-centric skills

PSO2. To apply computer knowledge continuously in the areas of networking, cryptography and web development to meet the industry requirements

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Knowledge and Attitude Profile (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM

(An Autonomous Institution, Affiliated to Anna

PROGRAM OUTCOMES

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM

(An Autonomous Institution, Affiliated to Anna University, Chennai)

REGULATIONS 2024

For Under Graduate Program

B.E. COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

CHOICE BASED CREDIT SYSTEM

CATEGORY OF COURSES

i. **Humanities and Social Sciences (HS)Courses** include Technical English, Environmental Science and Engineering, Engineering Ethics and human values, Communication Skills and Management courses.

ii. **Basic Sciences (BS**) **Courses** include Mathematics, Physics, and Chemistry.

iii. **Engineering Sciences (ES) Courses** include Engineering Practices, Engineering Graphics, Basics of Electrical / Electronics / Mechanical / Computer Engineering / Instrumentation etc.

iv. **Professional Core (PC) Courses** include the core courses relevant to the chosen programme of study.

v. **Professional Elective (PE) Courses** include the elective courses relevant to the chosen programme of study.

vi. **Open Elective (OE) Courses** include courses from other departments which a student can choose from the list specified in the curriculum of the students B.E. / B.Tech. Programmes.

vii. **Employability Enhancement Courses (EEC)** includes Project Work and/or Internship, Seminar, Professional Practices, Case Study and Industrial/Practical Training.

viii. **Mandatory (MC) Courses** include Personality and Character development and the courses recommended by the regulatory bodies such as AICTE, UGC, etc

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM – 630 612

(An Autonomous Institution, Affiliated to Anna University, Chennai)

B.E. COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

REGULATIONS 2024

CURRICULUM AND SYLLABUS

CHOICE BASED CREDIT SYSTEM

SEMESTER IV

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	24BS402	Probability and Statistics (Common to B.E. CSE, CSE(CS) ,CSE (IoT), B.Tech IT & AI&DS programmes)	BS	4	3	1	0	4
2	24CS401	Database Management Systems (Common to B.E. CSE, CSE(CS) , CSE(IoT) , B.Tech IT & AI&DS programmes)	PS	3	3	0	0	3
3	24CS403	Computer Networks (Common to B.E CSE,CSE(CS), B.Tech IT & AI&DS)	PC	3	3	0	0	3
4	24SC401	Machine Learning for Cyber Security	PC	3	3	0	0	3
5	24SC402	Social Network Security	PC	3	3	0	0	3
THEORY CUM PRACTICAL								
6	24CS404	Operating Systems (Common to B.E. CSE, CSE(CS), CSE(IoT) & B.Tech IT programmes)	PC	5	3	0	2	4
PRACTICAL								
7	24CS4L1	Database Management Systems Laboratory (Common to B.E. CSE, CSE(CS) , CSE(IoT), B.Tech IT & AI&DS programmes)	PC	3	0	0	3	1.5
8	24CS4L2	Computer Networks Laboratory (Common to B.E. CSE,& CSE(CS), programmes)	PC	3	0	0	3	1.5
9	24HS4L1	Aptitude and Soft Skills – III (Common to all B.E./B.Tech programmes)	EEC	2	0	0	2	1*
TOTAL				29	18	1	10	23

* **The grades earned by the students will be recorded in the mark sheet, however the same shall not be considered for the computation of CGPA**

24BS402	PROBABILITY AND STATISTICS	L	T	P	C
		3	1	0	4

OBJECTIVES:

- This course aims at providing the required skill to apply the statistical tools in engineering problems.
- To introduce the basic concepts of probability and random variables of one and two dimensions.
- To acquaint the knowledge of testing of hypothesis for small and large samples and to introduce the basic concepts of classifications of design of experiments which plays very important roles in the field of agriculture and statistical quality control.

Unit - I PROBABILITY AND RANDOM VARIABLES 9+3

Probability–Discrete and continuous random variables –Moments–Moment generating functions– Binomial, Poisson, Uniform, Exponential and Normal distributions (Except derivations).

Unit - II TWO-DIMENSIONAL RANDOM VARIABLES 9+3

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and linear regression –Transformation of random variables–Central limit theorem (for independent and identically distributed random variables).

Unit - III TESTING OF HYPOTHESIS 9+3

Sampling distributions - Estimation of parameters - Statistical hypothesis - Large sample tests based on Normal distribution for single mean and difference of means-Tests based on t,Chi-square and F distributions for mean, variance and proportion-Contingency table (test for independence)-Goodness of fit.

Unit - IV DESIGN OF EXPERIMENTS 9+3

One way and Two way classifications – Completely randomized design–Randomized block design–Latin square design-2^2 factorial design.

Unit - V STATISTICAL QUALITY CONTROL 9+3

Control charts for measurements (X and R charts) – Control charts for attributes (p, c and np charts)–Tolerance limits-Acceptance sampling.

TOTAL: 45+15 PERIODS

TEXT BOOKS:

1. Johnson.R.A.,Miller ,I and Freund J.,"Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia,8th Edition, 2015.
2. Veerarajan.T.,"Probability, Statistics and Random Processes", Tata Mc Graw Hill, New Delhi, 2006.

REFERENCES:

1. Papoulis.A. and Unnikrishnapillai.S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, New Delhi, 4thEdition, 2002.
2. Spiegel.M.R.,Schiller.J and Srinivasan.R.A.,"Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGrawHill,3rdEdition,2004.
3. Walpole.R.E.,Myers.R.H.,Myers.S.L. and Ye.K., "Probability and Statistics for Engineers and Scientists",Pearson Education,Asia,8thEdition,2011.
4. Gupta.S.C., Kapoor.V.K,, "Fundamental of Mathematical Statistics", Sultanch and & Sons Educational Publishers, New Delhi, Reprint 2013.

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : PROBABILITY AND STATISTICS		**Course Code : 224BS402**	
CO	**Course Outcomes**	**Unit**	**K –CO**
C209.1	Build the parameters of statistical distributions using basic probability theory concepts.	I	K3
C209.2	Calculate the statistical measures for two dimensional random variables.	II	K3
C209.3	Apply the concepts of testing of hypothesis for large and small samples.	III	K3
C209.4	Apply the basic concepts of design of experiments in the field of agriculture.	IV	K3
C209.5	Use control charts for quality control problems.	V	K3

HoD/CSE(CS)

24CS401	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To learn the fundamentals of data models and to depict a database system using ER Diagrams
- To study relational database model and to write SQL queries for store/retrieve database
- To understand Normalization technique to improve the performance data base design
- To understand the concepts of Transaction processing, concurrency control techniques and recovery procedures for real time applications
- To understand working procedures of query processing and internal storage structures using different file and indexing techniques which will help in physical DB design

Unit - I DATABASE FUNDAMENTALS 9

Purpose of Database System – Views of data – Data abstraction and data independence-Instances and schemas- Database System Architecture – Difference between File system and DBMS, Compare Centralized vs Distributed database, Data Models –Constraints- Keys with its types, Entity Relationship Model: Entity Sets – Relationship sets-Types of mapping constraints-Attributes–Relationships in ER diagram- E-R design issues– Extended ER features: Generalization, Specialization and Aggregation in ER model

Unit - II RELATIONAL DATABASE 9

Relational Algebra: Relational operators- Joins - Relational Calculus: Tuple relational calculus and Domain relational calculus, SQL: Types of commands- set operations, Constraints-Aggregate Functions- Clauses-– operators, Subqueries: Correlated and Nested Subqueries – Joins – Views – Authorization – Advanced SQL – Triggers – Cursors – Procedure – Functions – Embedded SQL – Dynamic SQL

Unit - III RELATIONAL DATABASE DESIGN 9

Need for Database Design – Functional Dependencies – Closure of Functional Dependencies – Canonical Cover – Armstrong Axioms - Problem of Redundancy in database-Lossless join and Dependency Preserving decomposition, Normalization: First Normal Form– Second Normal Form – Third Normal Form –Boyce Code Normal Form – Fourth Normal Form – Fifth Normal Form

Unit - IV TRANSACTIONS AND CONCURRENCY CONTROL 9

Transaction: ACID properties and their necessity – Transaction States – Schedule and conflict: Types of schedules–Conflict Serializable schedule–View Serializable schedule-Conflict equivalent schedule-Recoverability in DBMS: Recoverable and Irrecoverable Schedule-Cascading rollback, Cascade less and strict schedule, Equivalence of schedule, Concurrency Control: Lock Based Protocols–Time stamp based Protocols –Validation Based Protocols - Deadlock handling

Unit - V STORAGE AND QUERY PROCESSING 9

File Organization – RAID- Indexing and Hashing: Ordered Indices – Static Hashing – Dynamic Hashing, Comparison of Ordered indexing and Hashing, B+ tree Index Files, Query Processing – Measures of Query cost, Algorithms for SELECT and JOIN operations – Evaluation of expressions.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan — Database System Concepts, Seventh Edition, Tata McGraw Hill, 2019.
2. Ramez Elmasri, Shamkant B. Navathe —Fundamentals of Database Systems, Seventh Edition, Pearson Education, 2016.

REFERENCES:

1. Raghu Ramakrishnan —Database Management Systems, Fourth Edition, McGraw-Hill College Publications, 2015
2. C.J.Date, A.Kannan, S.Swamynathan -An Introduction to Database Systems, Eighth Edition, Pearson Education, 2006.

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : DATABASE MANAGEMENT SYSTEMS		**Course Code : 24CS401**	
CO	**Course Outcomes**	**Unit**	**K –CO**
C210.1	Illustrate the fundamental elements of relational database management systems and also ability to design the database using ER modeling.	I	K3
C210.2	Apply SQL queries to interact with database.	II	K3
C210.3	Apply normalization to design the database efficiently through elimination of anomalies	III	K3
C210.4	Analyze database transactions and can control them by applying ACID properties and also Summarize concurrency control protocols.	IV	K3
C210.5	Illustrate database storage structures and access techniques: file organization, indexing methods including B+ tree and hashing.	V	K3

HoD/CSE(CS)

24CS403	COMPUTER NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the concept of layering and functions of each layers of the protocol suit
- To be familiar with the components required to build different types of networks
- To learn concepts related to network addressing and routing
- To familiarize the functions and protocols of the layer of Transport layer
- To understand the working of various application layer protocols

Unit - I INTRODUCTION TO NETWORKS 8

Network Introduction: Evolution of Computer Networks, Classification of computer Networks LAN, WAN, MAN, Software Defined Networks (SDN), Network Topology: BUS, STAR, RING, MESH, OSI Layered Architecture, TCP/IP Protocol Suite.

Unit - II MEDIA ACCESS & INTER NETWORKING 12

Medium Access Control Techniques: Random, Round Robin, Reservation: ALOHA Pure and Slotted, CSMA/CD-CSMA/CA- Ethernet-Token Ring-Token Bus-ARQ 3 Types, Data Link Layer design issues: Error Detection Codes, Parity Check, Checksum Error Correction Codes, Hamming codes, IEEE Standards: Bluetooth (802.15), Basic Internetworking: IP - CIDR - ARP - DHCP - ICMP.

Unit - III NETWORK DEVICES AND NETWORK LAYER 8

Network Devices: Router, Switch, HUB, Bridge, Routing: Static Routing, Dynamic Routing, Categories of Routing – RIP v1 and RIP v2 –IPV4 Addressing - IPV6 Addressing

Unit - IV TRANSPORT LAYER 9

Overview of Transport layer: UDP - Reliable byte stream (TCP), Connection Management: Flow control – Retransmission – TCP Congestion control, Congestion avoidance:

Unit - V APPLICATION LAYER 8

Traditional applications: SSH – HTTP – FTP –DNS – SNMP - Telnet

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.
2. William Stallings, Data and Computer Communications, Tenth Edition, Pearson Education, 2013.

REFERENCES

1. Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, Morgan Kaufmann Publishers Inc., 2012.
2. Nader F. Mir, Computer and Communication Networks, Second Edition, Prentice Hall,

2014.
3. Ying-Dar Lin, Ren-Hung Hwang and Fred Baker, Computer Networks: An OpenSource Approach, McGraw Hill Publisher, 2011.
4. James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down Approach Featuring the Internet, Sixth Edition, Pearson Education, 2013.

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : COMPUTER NETWORKS		**Course Code : 24CS403**	
CO	**Course Outcomes**	**Unit**	**K –CO**
C211.1	Identify the different types of computer networks and their layered architectures to determine suitable networking solutions.	I	K3
C211.2	Analyze various MAC techniques and apply link-layer error-handling methods in communication scenarios.	II	K4
C211.3	Apply routing concepts to evaluate the functioning of network devices and analyze IPv4/IPv6 addressing schemes	III	K4
C211.4	Generalize the transport-layer mechanisms by applying TCP/UDP concepts to real-time data transmission problems	IV	K4
C211.5	Illustrate application-layer protocols to analyze how common network services enable end-to-end communication.	V	K4

HoD/CSE(CS)

24SC401 MACHINE LEARNING FOR CYBER SECURITY

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the Data science Process and python libraries
- To understand the need for machine learning for various problem solving in security
- To study the various supervised, and unsupervised learning algorithms in machine learning
- To understand the latest trends in machine learning for cyber security analysis
- To design appropriate machine learning algorithms for problem solving

Unit - I SUPERVISED LEARNING: REGRESSION 10

Understanding Data: The Core of Machine Learning - Importance of Data Preparation - Data Preprocessing: Cleaning and Preparing Data - Paradigms of Machine Learning - Examples- Types of Learning - Types of supervised learning - Introduction to Regression - Linear regression - Geometrical Interpretation - Iterative solution: Gradient descent - Performance metrics of machine learning - Python libraries suitable for Machine Learning.

Unit - II SUPERVISED LEARNING: CLASSIFICATION 9

K-Nearest Neighbour Classification - Distance metric and Cross-Validation - Introduction to Decision Trees - Entropy and Information Gain - Naive Bayes classifier - Perceptron and its learning algorithm: Multilayer perceptron, activation functions, network training – Deep learning: ReLU - Support Vector Machine.

Unit - III UNSUPERVISED LEARNING 9

K-means Clustering - LLyod's Algorithms - Convergence and Initialization - PCA - Anomaly detection, Intrusion Detection, outliers

Unit - IV NETWORK AND MALWARE ANALYSIS 9

Network Analysis - Static and Dynamic Analysis, Spam/Phishing Detection - Training Models and Measuring Efficacy, - Fraud Detection - DDoS Detection

Unit - V CASE STUDIES 8

Email Observing, Learning Methods for Detecting Malicious Executables, Network Cyber threat Detection, Spam filtering - Machine learning for end point protection - Network protection - Application security

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Marc Peter Deisenroth, A. Aldo Faisal and Cheng Soon Ong, “Mathematics for Machine Learning”, Cambridge University Press, 2020.
2. Michael Sikorski and Andrew Honig, “Practical Malware Analysis” by No Starch Press, 2012,

REFERENCES:

1. D. K. Bhattacharyya and J. K. Kalita, Network Anomaly Detection: A Machine Learning Perspective, 1st Edition, Chapman and Hall/CRC, 2013.
2. Stephen Marsland, “Machine Learning: An Algorithmic Perspective”, CRC Press, 2009.
3. Mehryar Mohri, Afshin Rostamizadeh and Ameet Talwalkar, “Foundations of Machine Learning”, MIT Press, 2012

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : MACHINE LEARNING FOR CYBER SECURITY		**Course Code : 24SC401**	
CO	**Course Outcomes**	**Unit**	**K –CO**
C212.1	Identify the category of the learning problem, apply linear regression and measure it’s performance like recall, precision and F-Measure	I	K3
C212.2	Apply the classification algorithms like KNN, Decision Tree, Naive Bayes to classify the data set...	II	K3
C212.3	Apply unsupervised algorithms namely K-means and PCA to cluster the given data set.	III	K3
C212.4	Understand the concept of network and malware analysis to measure the efficacy	IV	K2
C212.5	Identify and analyze the problem in phishing & spam detection and Implement network cyber threat detection using suitable machine learning techniques.	V	K3

HoD/CSE(CS)

24SC402	SOCIAL NETWORK SECURITY	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To develop semantic web related simple applications
- To explain Privacy and Security issues in Social Networking
- To explain the data extraction and mining of social networks
- To discuss the prediction of human behavior in social communities
- To describe the Access Control, Privacy and Security management of social networks

Unit - I FUNDAMENTALS OF SOCIAL NETWORKING 9

Introduction to Semantic Web, Development of Semantic Web, Emergence of the Social Web, Social Network analysis, Development of Social Network Analysis, Key concepts and measures in network analysis, Historical overview of privacy and security, Major paradigms, for understanding privacy and security

Unit - II SECURITY ISSUES IN SOCIAL NETWORKS 9

The evolution of privacy and security concerns with networked technologies, Contextual influences on privacy attitudes and behaviors, Anonymity in a networked world

Unit - III EXTRACTION AND MINING IN SOCIAL NETWORKING DATA 9

Extracting evolution of Web Community from a Series of Web Archive, Detecting communities in social networks, Definition of community, Evaluating communities, Methods for community detection and mining, Applications of community mining algorithms, Tools for detecting communities social network infrastructures and communities, Big data and Privacy

Unit - IV PREDICTING HUMAN BEHAVIOR AND PRIVACY ISSUES 9

Understanding and predicting human behavior for social communities, User data Management, Inference and Distribution, enabling new human experiences, Reality mining, Context, Awareness, Privacy in online social networks, Trust in online environment, what is Neo4j, Nodes, Relationships, Properties

Unit - V ACCESS CONTROL, PRIVACY AND IDENTITY MANAGEMENT 9

Understand the access control requirements for Social Network, Enforcing Access Control Strategies, Authentication and Authorization, Roles-based Access Control, Host, storage and network access control options, Firewalls, Authentication, and Authorization in Social Network, Identity & Access Management, Single Sign-on, Identity Federation, Identity providers and service consumers, The role of Identity provisioning

TOTAL: 45 PERIODS

TEXT BOOKS

1. Peter Mika, “Social Networks and the Semantic Web, First Edition, Springer 2007.
2. BorkoFurht, “Handbook of Social Network Technologies and Application, First Edition, Springer, 2010.

REFERENCES

1. Learning Ne04j 3.x – Second Edition Jerome Baton , Rik Van Bruggen, Packet Publishing
2. Easley D. Kleinberg J., "Networks, Crowds, and Markets – Reasoning about a Highly Connected World", Cambridge University Press, 2010.
3. Jackson, Matthew O., "Social and Economic Networks", Princeton University Press, 2008.
4. GuandongXu ,Yanchun Zhang and Lin Li, "Web Mining and Social Networking – Techniques and applications", First Edition, Springer, 2011.
5. Dion Goh and Schubert Foo, "Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively", IGI Global Snippet, 2008.
6. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, "Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modeling", IGI Global Snippet, 2009.
7. John G. Breslin, Alexander Passant and Stefan Decker, "The Social Semantic Webll, Springer, 2009

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : SOCIAL NETWORK SECURITY		**Course Code : 24SC402**	
CO	**Course Outcomes**	**Unit**	**K –CO**
C213.1	Develop semantic web related simple applications	I	**K3**
C213.2	Address Privacy and Security issues in Social Networking	II	**K3**
C213.3	Apply tools and algorithms to detect communities in social network and evaluate it	III	**K3**
C213.4	Predict human behavior for social communities	IV	**K3**
C213.5	Describe the applications of social networks	V	**K2**

HoD/CSE(CS)

24CS404	OPERATING SYSTEMS	L	T	P	C
		3	0	2	4

OBJECTIVES:

- To understand the basic concepts and functions of operating systems.
- To understand Processes, Threads and Scheduling algorithms.
- To understand the concept of Deadlocks.
- To analyze various memory and I/O management schemes.
- To study various operating systems like Distributed OS, Real-Time OS, Virtual machine and basic concepts of virtualization.

UNIT-I OPERATING SYSTEM OVERVIEW 6

Operating System Overview - Objectives and Functions, Evolution of Operating Systems, Operating System Structure and Operations- System Calls, System Programs, Operating Systems Generation and System Boot.

LAB COMPONENT 6

- Basic Linux Commands and Overview
- Write Shell Script to experiment with system calls like fork, grep, pipe, open, create read, write, etc.

UNIT-II PROCESS MANAGEMENT AND CONCURRENCY CONTROL 10

Processes - Process Concept and Scheduling, Operations on Processes, Inter Process Communication - CPU Scheduling - Scheduling criteria, Scheduling algorithms; Threads-Overview, Multithreading models, Threading issues - Process Synchronization - The critical-section problem, Mutex locks,Semaphores, Classic problems of synchronization, critical region, Monitors.

LAB COMPONENT 6

- Implementation of FCFS, SJF, Round Robin, Priority Scheduling Algorithms and analyzing their performance
- Implement semaphore for solving producer-consumer problem using threads.

UNIT - III DEADLOCK AND STORAGE MANAGEMENT 10

Deadlock - System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock;Main Memory - Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation; Virtual Memory - Background, Demand Paging, Page Replacement, Allocation, Thrashing - Allocating Kernel Memory.

LAB COMPONENT 6

- Simulate situations for testing Deadlock avoidance algorithm.
- Implementation Of FIFO, LRU, Optimal Page Replacement Algorithms

UNIT - IV MASS STORAGE AND FILE SYSTEMS 10

Overview of Mass Storage System and Structure- Disk Structure, Disk Scheduling and Management Swap space management; File-System-Interface- File concept, Access methods, File Sharing and Protection, Allocation Methods, Free Space Management; Directory- Structure, organization, implementation.

LAB COMPONENT 6

- Implementation of Directory organizations like - single, two-level, hierarchy
- Implementation of Allocation methods used for files like - sequential, indexed, linked

UNIT - V ADVANCED OPERATING SYSTEMS AND VIRTUALIZATION 9

Basics of Network Operating System, Server Operating System, Real Time Operating System and Distributed Operating Systems - Virtual Machines - Types and Structure - virtualization - Types, Techniques and Application - supporting multiple operating systems simultaneously on a single hardware platform; Running one operating system on top of another.

LAB COMPONENT 6

- Case Study to Learn Virtualization platforms - VM Ware, etc.
- Installation of Raspbian OS in Raspberry pi and execute OS services using simple C programs

TOTAL: 45+30 PERIODS

TEXT BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, - Operating System Concepts, 10th Edition, John Wiley and Sons Inc., 2018.
2. William Stallings, "Operating Systems - Internals and Design Principles", 9th Edition, Prentice Hall, 2018.

REFERENCES:

1. Andrew S. Tanenbaum, "Modern Operating Systems", Fifth Edition, Pearson Publications, 2022.
2. AchyutS.Godbole, AtulKahate, - Operating Systemsll, McGraw Hill Education, 2016.
3. RamazElmasri, A. Gil Carrick, David Levine, - Operating Systems - A Spiral Approach, Tata McGraw Hill Edition, 2010

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : OPERATING SYSTEMS		**Course Code : 24CS404**	
CO	**Course Outcomes**	**Unit**	**K –CO**
C214.1	Explain the basic functions, structure and operations of Operating System	I	K2
C214.2	Analyze process synchronization methods and performance of CPU scheduling algorithms like FCFS, SJF, Priority and Round Robin.	II	K4
C214.3	Apply the concept of deadlock avoidance and memory management schemes using paging and segmentation	III	K3
C214.4	Generalize the concepts of mass storage systems, various file allocation methods and directory structures	IV	K3
C214.5	Classify different operating systems based on application requirements and utilize virtualization platform to build virtual machines.	V	K3

HoD/CSE(CS)

24CS4L1 DATABASE MANAGEMENT SYSTEMS LABORATORY

L	T	P	C
0	0	3	1.5

OBJECTIVES:

- To write and debug Database commands.
- To implement advanced query in Database tool.
- To use functions and procedures for implementing simple logics in Database.
- To design real time applications using front end tool and Database.
- To implement Database connectivity for real time application.

LIST OF EXPERIMENTS

1. Implementation of Data Definition and Data Manipulation Language Commands of SQL with suitable examples.
2. Implementation of Data Control and Transaction Control Language Commands of SQL with suitable examples.
3. Implementation of Aggregate Functions and Set Operations with suitable examples.
4. Implementation of different types of constraints and Group by, Order by, Having clause with suitable examples
5. Implementation of different types of Joins with suitable examples.
6. Implementation of Nested Sub queries and Views.
7. Study of PL/SQL programs
8. PL/SQL - procedures
9. PL/SQL - Functions
10. PL/SQL – Triggers and Cursor
11. Front end application development – Create Forms, Menu and Reports.
12. Implementation of Database Connectivity

PLATFORM NEEDED: Oracle/Mysql/Visual Basics/Netbeans IDE

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able to

Course Name : DATABASE MANAGEMENT SYSTEMS LABORATORY		**Course Code : 24CS4L1**	
CO	**Course Outcomes**	**Exp.No**	**K –CO**
C215.1	Develop simple Database using DDL, DML and TCL commands.	1,2	K3
C215.2	Create Relational Database for real time application through Database constraints.	3,4	K3
C215.3	Write and execute nested sub queries and join queries with privileges.	5,6	K3
C215.4	Develop PL/SQL programs using Procedure, Functions, Triggers and Cursor.	7-10	K3
C215.5	Design real time applications with Database Connectivity.	11,12	K3

HoD/CSE(CS)

24CS4L2	COMPUTER NETWORKS LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES:

- To learn and use network commands.
- To learn socket programming.
- To implement and analyze various network protocols.
- To learn and use simulation tools.
- To use simulation tools to analyze the performance of various network protocols.

LIST OF EXPERIMENTS

1. Study of Network Devices
2. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation.
3. Learn to use commands like TCP dump, netstat, ifconfig, nslookup and traceroute. Capture ping and trace route PDUs using a network protocol analyzer and examine.
4. Configure a Network topology using packet tracer software
5. Write a code simulating ARP /RARP protocols
6. Configure Network using Link State Vector Routing protocol & Distance Vector Routing protocol.
7. Echo client and server Applications using TCP sockets
8. Chat Applications using UDP sockets
9. File Transfer Applications using TCP sockets
10. Simulation of DNS using UDP sockets

LABORATORY REQUIREMENT FOR BATCH OF 30 STUDENTS:

1. Windows 7 or higher
2. C / C++ / Java / Python / Equivalent Compiler
3. Network simulator Cisco Packet Tracer/GNS3

TOTAL: 45 PERIODS

OUTCOMES:

AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO:

Course Name : COMPUTER NETWORKS LABORATORY		Course Code : 24CS4L2	
CO	**Course Outcomes**	**Exp. No.**	**K –CO**
C216.1	Demonstrate the configuration of network devices and IP addressing in basic networking scenarios	1,2	K3
C216.2	Use network diagnostic commands and tools to examine, capture, and interpret protocol operations	3	K3
C216.3	Demonstrate network topologies and protocol behaviors using simulation tools such as Packet Tracer.	4	K3
C216.4	Make use of routing and address-resolution protocols (ARP, RARP, LS, DV) to validate network connectivity and routing decisions	5,6	K3
C216.5	Develop client–server network applications using TCP and UDP socket programming	7-10	K3

HoD/CSE(CS)

24HS4L1	APTITUDE AND SOFT SKILLS - III	L	T	P	C
		0	0	2	1

Module I LOGICAL REASONING SKILLS 10

Logical Reasoning, Letter and Symbol series, Number series, Analyzing arguments, Making judgments, Logical Reasoning, Direction Sense test, Venn diagrams, Seating arrangements, Cause and effect, Blood relation test, Dice Logical, verbal puzzles, Analytical puzzles and sudoku.

Module II BEHAVIOURAL SKILLS 5

Interview Etiquettes - Body language, Dress code, Eye contacts, Handshakes for Interview - Interview handling – Mock Interview Videos - High Frequency words in resume and interviews - Visual Interpretation – HR Interview question – Sell yourself - Interpersonal and intrapersonal communication

Module III VERBAL SKILLS 15

Vocabulary basics, Grammar basics, Critical Reasoning, Reading comprehension, Synonyms, Antonyms, Idioms and phrases - sentence completion, Spotting errors, Error correction, Sentence correction, Writing Resume, Letter writing, Official mail correspondence - Ways to communicate in different scenarios-job interview, business meeting, project proposal submission, informal gathering, speech for a large audience and debate.

TOTAL: 30 PERIODS

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1. Quantitative aptitude for competitive examinations , R.S.Agarwal, S.Chand publications
2. Quantitative Aptitude – AbijithGuha, TMH
3. Quantitative Aptitude for Cat – ArunSharma,TMH
4. Gulati. S., (2006) “Corporate Soft Skills”, New Delhi, India: Rupa& Co.
5. Prasad, HariMohan,A Handbook of Spotting Errors, Mcgraw Hill Education, 2010

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