**JAVA:**

**CO3:**

Introduction to Multithreading and Parallel Programming

Thread Concepts & its States

CreatingTasks & Threads, Thread Classes, Thread Pools.

Thread Synchronization

Thread Locks

Cooperation among Threads

Case Study: Producer/Consumer

Blocking Queues

Semaphores

Deadlock Avoidance.

**CO4:**

File System and its Limitations

JDBC - API

JDBC - Architecture (2 Tier & 3 Tier)

Drivers & Its Types

Packages of JDBC Connections.

Steps to connect to Databases (PostgreSQL) - I

Steps to connect to Databases (PostgreSQL) - II

JDBC CRUD Operation in Java Class File (PostgreSQL) - I

JDBC CRUD Operation in Java Class File (PostgreSQL) - II

**CO5:**

Overview of Client-Server Communication

Overview of Servlet

Servlet demo Application development with JSP Form Data

JSP & Advantages over servlets.

JSP Features, syntax, Life Cycle of JSP

Environmental Setup for JSP.

Interaction between Servlet and JSP Form Data

Interaction between JDBC, Servlet and JSP Form Data for CRUD Operation - I

Interaction between JDBC, Servlet and JSP Form Data for CRUD Operation – II

**THEORY OF COMPUTATION:**

**CO3:**

Pushdown Automata: Definition, Instantineous Description of PDA, Notion of Acceptance for PDA: by final states and by empty stack.

CFG-PDA equivalence.

Pumping Lemma for CFL and closure properties of CFL, Linear bound automata.

Turing Machines: Turing machine model, techniques for Turing machine construction

Turing machines as language acceptors, combining Turing machines

Undecidability: Definition of recursive and recursively enumerable languages, universal Turing machine

Chomsky Hierarchy of Languages

**CO4:**

Chomsky Hierarchy of Language and Halting Problem

Variants of Turing Machine

Explain Time and Space Complexity

Differentiate P, NP Problems and undecidability

Reducibility

PSPACE

**NPS:**

**CO3:**

Address Resolution Protocol (ARP), Dynamic Host Configuration Protocol (DHCP)

Types of Routing: static

Dynamic routing

Networking Protocols: Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Border Gateway Protocol (BGP)

Access Control list for IPV4,IPV6, Other Protocols

Transport Layer: Process to Process Delivery, UDP

TCP, Stream Control Transmission Protocol (SCTP)

Congestion Control: Open Loop, Closed Loop Choke Packets

Quality of Service: Techniques to Improve QoS

Leaky bucket algorithm

Token bucket algorithm

**CO4:**

Application Layer: Domain Name System (DNS), Simple Mail Transfer Protocol (SMTP), Simple Network Management Protocol (SNMP)

Introduction to security, security goals

Security Attacks, Security Services and Mechanisms

A Security Model, Asymmetric & Symmetric key Ciphers

Substitution Techniques

Transposition Techniques

Data Encryption Standard (DES)

Data Encryption Standard (DES)

RSA algorithm

Secure Socket Layer

**OS:**

**CO3:**

Persistence: I/O Devices

Hard Disk Drives

Disk Scheduling Algorithms

Redundant Disk Arrays (RAID)

Files and Directories

File System Implementation

Distributed systems

Data Integrity and Protection

Inter-process communication

**CO4:**

Concurrency: Concurrency and Threads code

Thread API

Common concurrency problems

Locks

Locked Data Structures.

Condition Variables

Mutex

Semaphores

Monitors

Deadlock: Prevention, Detection and Avoidance.

**P&C:**

**CO3:**

Introduction to 8051 Interfacing

GPIO Interfacing (Flipped Topic)

Timers and Interfacing Seven Segment

LCD Interfacing.

Motor Interfacing-8051

Stepper Motor Interfacing

ADC Interfacing

DAC Interfacing-8051

Keypad interfacing

Case studies: Traffic signal, Home Automation & Industrial Applications .

**CO4:**

Introduction to PIC Microcontrollers

PIC Architecture (Flipped Topic)

Timer/Counter and PWM

Introduction to ARM Microcontrollers and Evolution of ARM.

ARM features & ARM series of microcontrollers

The architecture of ARM Microcontroller .

Memory Organization & Basic concepts of pipeline processing.

ARM processor modes

Special registers and exception handling,

ARM and Thumb modes of execution .