IPS Academy, Institute of Engineering & Science

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Scheme Based on AICTE Flexible Curriculum

Department of Computer Science &Engineering- AIML

Bachelor of Technology (B.Tech.)

Semester-IV

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme			Credits
				L	T	P	
1.	BSC	MA04	Discrete Structure	3	–	–	3
2.	PCC	CL06	Computer Network	2	1	–	3
3.	PCC	CL07	Analysis & Design of Algorithm	2	1	–	3
4.	PCC	CL08	Operating System	2	1	–	3
5.	HSMC	HS03	Innovation and Creativity	–	–	2	1
6.	IFC	CB01	Interdisciplinary Foundation Course-I	2	–	–	2
7.	LC	CL06(P)	Computer Network Lab	–	–	2	1
8.	LC	CL07(P)	Analysis & Design of Algorithm Lab	–	–	2	1
9.	LC	CL08(P)	Operating System Lab	–	–	2	1
10.	LC	CL09(P)	Advanced Python Lab	–	–	4	2
11.	LLC	LLC02	Liberal Learning Course–II (NCC/NSO/NCA)	-	-	2	1
12.	SBC	CL01(P)	Web Development Technology	-	-	2	1
13.	MLC	MLC02	Constitution of India	1	–	–	Audit
Total Academic Credits							22

- InterdisciplinaryFoundationCourse-I,IFC-CB01
  (Offered by Cyber Security IOT including Blockchain Technology Branch.)
  - Blockchain Technology

Note:

- **LiberalLearningCourse-II,LLC-02(Any One Course from NCC/NSO/NCA)**
  - **NCC**
  - **NSO**
    - Any one Sports at State Level
  - **NCA**
    - Music
    - Dance
    - Photography
    - Cinematography
    - Interior Design
    - Podcasting
    - Theatre
    - Painting etc.

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IV Semester

PCC-CL06	Computer Network	2L:1T:0P (4hrs.)	Credits:03

Prerequisite:

Course Objective:

This course provides a foundation to understand computer networks using layered architectures.

Course Contents:

Module1: **(06hrs)**

Introduction to computer networks: Network – Component and Categories – Topologies Reference Models: ISO/OSI Model and TCP/IP Protocol suite. Principals of physical layer: Transmission Media, Bandwidth, Multiplexing, Switching.

Module2: **(08hrs)**

Data Link Layer: Need, Services Provided, Framing, Flow Control, Error control. Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Hybrid ARQ. Protocol verification: Finite State Machine Models & Petri net models. ARP/RARP.

Module3: **(10hrs)**

MAC Sublayer: MAC Addressing, Binary Exponential Back-off(BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted-ALOHA), for Local-Area Networks (CSMA, CSMA/CD, CSMA/CA), Collision Free Protocols: Basic Bit Map, Binary Count Down, Adaptive Tree Walk, Performance Measuring Metrics. IEEE Standards 802 series & their variant.

Module4: **(08hrs)**

Network Layer: Need, Services Provided, Designissues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing. IP Addresses, Header format, Packet forwarding, Fragmentation and reassembly, ICMP, Comparative study of IPv4 & IPv6.

Module5: **(10hrs)**

Transport Layer: Design issues, UDP: Header Format, Per-Segment Checksum, Carrying Uncast/Multicast Real-Time Traffic, TCP: Connection Management, Reliability of Data Transfers, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management. Application Layer: WWW and HTTP, FTP, SSH, DHCP, Email (SMTP, MIME, IMAP), DNS, Network Management (SNMP).

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Course Outcomes:

1. Describe basics of computer network, network architecture, TCP/IP protocol suite, OSI reference models & fundamentals of physical layer.
2. Classify data link protocol like flow control, error control, bit-oriented protocol and solve ARQ techniques.
3. Paraphrase multi-channel access protocol, IEEE 802 standards & use Ethernet standards.
4. Solve routing, congestion problems, addressing & subnet. Discuss IP protocol.
5. Distinguish various transport & application layer protocols.

List of Text/Reference Books:

1. Andrew S.Tanenbaum, David J.Wetherill, "Computer Networks" Pearson New International Edition, 5th Edition, 2013.
2. Douglas E Comer, "Internet working with TCP/IP Principles, Protocols, and Architecture- Volume I" 6th Edition, Prentice Hall of India.
3. Dimitri Bertsekas, Robert Gallager, "Data Networks", PHI Publication, Second Edition.
4. Kaveh Pahlavan, Prashant Krishnamurthy, "Networking Fundamentals", Wiley Publication. First Edition, 2009.
5. Ying-DarLin, Ren-Hung Hwang, FredBaker,"Computer Networks:An Open Source Approach", McGrawHill.2011.
6. Behrouz A. Forouzan, "Data Communication and Networking", McGraw Hill, 5th Edition, 2013.
7. William Stallings, "Data and Computer Communication" 8th Edition, 2007.
8. W. Richard Stevens. "TCP/IP Illustrated, Volume 1", Addison Wesley, United States of America.

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IV Semester

PCC-CL07	**Analysis & Design of Algorithm**	**2L: 1T:0P (4hrs.)**	**Credits:03**

Prerequisite: Data Structure & Algorithm

Course Objective:

To understand different algorithm design techniques and Analyze the asymptotic performance of algorithms.

Course Contents:

Module1: **(06hrs)**

Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, heap and heap sort. Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, example binary search, merge sort, quick sort, strassen's matrix multiplication.

Module2: **(10hrs)**

Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm, Non Deterministic algorithms, The classes : P, NP, NP Complete, NP Hard, Satisfiability problem, Proofs for NP Complete Problems: Clique, Vertex Cover. Introduction to approximate and randomized algorithms.

Module3: **(08hrs)**

Concept of dynamic programming, problems based on this approach such as 0/1knapsack, multistage graph, reliability design, Floyd-Warshall algorithm, Sum of subset problem, Matrix Chain Multiplication, Longest common subsequence.

Module4: **(10hrs)**

Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc. Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Meaning of lower bound theory and its use involving algebraic problem, introduction to parallel algorithms.

Module5: **(10hrs)**

Hashing: Hash Function, Address calculation Technique, Common Hashing Function, Collision resolution, Linear probing, Quadratic Double Hashing, Bucket Hashing, Deletion and Rehashing.

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Course Outcomes:

1. Analyze the asymptotic performance of recursive and non-recursive algorithms.
2. Discuss different algorithm design techniques for deterministic and non-deterministic problems.
3. Solve problems using Greedy method & Dynamic programming techniques.
4. Demonstrate Backtracking, Branch and Bound strategy.
5. Describe different types hashing techniques.

List of Text Books/Reference Books:

1. Coremen Thomas, Leiserson CE, Rivest RL, "Introduction to Algorithms"3rdEd, 2009 PHI.
2. Horowitz & Sahani, "Analysis & Design of Algorithm" Computer Science Press
3. Ullmann, "Design & Analysis of Computer Algorithms" Pearson
4. Michael T Goodrich, Robarto Tamassia,"Algorithm Design", Wiely India
5. Rajesh K Shukla, "Analysis and Design of Algorithms: A Beginner's Approach", Wiley

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IV Semester

PCC-CL08	Operating System	2L:1T:0P(4hrs.)	Credits:03

Prerequisite: Computer Organization & Architecture

Course Objective:

This Course provides a comprehensive introduction of Operating System, Process Management, Memory Management, File Management and I/O management.

Course Outcomes:

Module1: **(06hrs.)**

Introduction to Operating Systems: Function, Evolution, Different Types, Desirable Characteristics and features of an O/S, Operating Systems Services: Types of Services, Different ways of providing these Services – Utility Programs, System Calls, Operating System Structure, and Spooling & Buffering.

Module2: **(11hrs.)**

CPU Scheduling: Process Concept, Scheduling Concepts, Types of Schedulers, Scheduling Criteria, Process State Diagram, Scheduling Algorithms, Operation on Process, Algorithms Evaluation, System calls for Process Management; Multiple Processor Scheduling; Concept of Threads.

Module3: **(06hrs.)**

Concurrent Processes: Real and Virtual Concurrency, Mutual Exclusion, Synchronization, Inter-Process Communication, Critical Section Problem, Solution to Critical Section Problem: Semaphores – Binary and Counting Semaphores, WAIT & SIGNAL Operations, and their implementation. Deadlocks: Deadlock Problems, Characterization, Prevention, Avoidance, Recovery.

Module4: **(11hrs.)**

Memory Management: Different Memory Management Techniques – Partitioning, Swapping, Segmentation, Paging, Paged Segmentation, Comparison of these techniques, Techniques forsupporting the execution of large programs: Overlay, Dynamic Linking and Loading,Virtual Memory– Concept, Implementation by Demand Paging etc., Page replacement algorithms.

Module5: **(06hrs.)**

File Systems: File Concept, User's and System Programmer's view of File System, Disk Organization, Tape Organization, Different Modules of a File System, Disk Space Allocation Methods – Contiguous, Linked and Indexed. Directory Structures, File Protection, System Calls for File Management, Disk Scheduling Algorithms. Introduction to Network, Distributed and Multiprocessor Operating Systems. Case Studies: Unix/Linux, WINDOWS, and other Contemporary Operating Systems.

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IV Semester

Course Outcomes:

1. State the core concepts of operating system, evolution and types of operating system.
2. Illustrate CPU & process scheduling concepts.
3. Illustrate various input output concepts, inter process communication and deadlock.
4. Describe the concept of memory management techniques.
5. State the core concepts of file, disk management and various types of operating system.

ListofText/ReferenceBooks:

1. Avi Silberschatz, Peter Galvin, Greg Gagne, "Operating System Concepts Essentials", Wiley Asia Student Edition, 10th Edition, 2018.
2. William Stallings, "Operating Systems: Internals and Design Principles",Prentice Hall of India, 5th Edition, 2005.
3. Charles Crowley, "Operating System: A Design-orientedApproach",Irwin Publishing,1st Edition.
4. Gary J. Nutt, "Operating Systems: A Modern Perspective", Addison-Wesley, 2nd Edition.
5. Maurice Bach, "Design of the Unix Operating Systems", Prentice-Hall of India, 8th Edition.
6. Daniel P.Bovet, Marco Cesati, "Understanding the Linux Kernel", O'Reilly and Associates,3rd Edition.
7. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall, 3rd Edition, 2007.
8. Bovet & Cesati, "Understanding the Linux Kernel", O'Reily, 3rd Edition.

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IV Semester

IFC-CB-01	**Block Chain Technology**	**2L:0T :0P(2 hrs.)**	**2credits**

Prerequisite: NA

Course Objective:

To understand the concept of Blockchain and its platforms-Bitcoin, Ethereum, Hyperledger and Multichain. The course provides an overview of the structure and mechanism of Blockchain.

Course Contents:

Module1: **(05hrs.)**

Introduction and crypto foundation: Elliptic curve Cryptography, ECDSA, encryption and decryption. Introduction to Blockchain Technology with its Applications, Blockchain Network, Hashing Algorithm, SHA-256, Immutable Ledger, Centralized and Distributed P2P Network.

Module2: **(05hrs.)**

Blockchain Mining, Byzantine General Problem, Consensus Protocol and its types- Proof of work (PoW) and proof-of-stake (PoS) algorithm.

Module3: **(05hrs.)**

Bitcoin, Bitcoin addresses, Bitcoin Ecosystem, Bitcoin's Monetary Policy, The Halving Problem, Block frequency, The Nonce, difficulty adjustment algorithm, mining pools, transactions, Ethereum, overview of differences between Ethereum and bitcoin, block format, mining algorithm, account management, contracts, Solidity language, decentralized application using Ethereum.

Module4: **(05hrs.)**

Introduction to Smart Contracts, Different Blockchains and Consensus mechanisms. Smart contacts (escrow, micropayments, and decentralized lotteries), payment channels.

Module 5: Application Areas of Blockchain **(05hrs.)**

Blockchain and its application with IOT and Cybersecurity, Blockchain and SecurityR3, CORDA and Hyperledger System architecture, ledger format, chain code, transaction flow and ordering, private channels, membership service providers, case studies.

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IV Semester

Course Outcomes:

After Completing the course student should be able to:

1. Describe the basic concepts blockchain technology.
2. Understand several types of consensus protocols.
3. Illustrate the concepts of Bitcoin along with different types of crypto currencies.
4. Understand the working and importance of smart contracts.
5. Analyze the blockchain applications in a structured manner.

List of Text/Reference Books:

1. Mastering Bitcoin: Unblocking Digital Crypto currencies, by Andreas Antonopoulos.
2. Mastering Ethereum, Antonopoulos, Andreas M. and Wood, O'ReillyMedia,Inc.,2018
3. An Introduction to Bitcoin, V. Saravanan, Lecture Notes.
4. Bitcoin and Crypto currencies Technologies: A Comprehensive Introduction, Arvind Narayanan, Princeton University Press (July 19, 2016) ISBN-10:0691171696.

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IV Semester

LC-CL06(P)	**Computer Network Lab**	**0L:0T:2P(2hrs.)**	**Credits:01**

Prerequisite:

Course Objective:

The course offers fundamental computer network knowledge, tailored for aspiring network engineers, designers, and administrators. Learning outcomes include understanding network basics and proficiency in design and troubleshooting.

Module1:

Introduction to computer networks: Networking Devices, Network – Component and Categories, Local area networks and Wide area networks. Color coding standard of CAT 5 ,6 ,7 and crimping of cable in RJ-45, Principals of physical layer: Transmission Media, Bandwidth.

Module2:

Introduction to packet tracer simulator, Network topologies, Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Error control, framing. ARP.

Module3:

Network Layer: Routing algorithms: Dijkstra's algorithm, Bellman-ford algorithm, IP Addresses, classful & classless addressing, IP routing, Sub netting and super netting, ICMP.

Module4:

Transport Layer: TCP service protocols, UDP: Header Format, Per-Segment Checksum, Socket programming.

Module5:

Introduction to the various internetworking devices and their basic configuration, Study of various application layer protocols.

Course Outcomes:

1. Demonstrate LAN configuration and discuss various types of transmission media and network equipments.
2. Implement various functionalities of data linklayer and build network topology using packet tracer.
3. Analyze the requirements for a given organizational requirement and select the most appropriate networking architecture and technologies.
4. Implement socket programming and simulate TCP using wire shark.
5. Distinguish various internetworking devices and study of application layer protocols.

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IV Semester

List of Text/Reference Books:

1. Andrew S.Tanenbaum, David J.Wetherill, "Computer Networks" Pearson New International Edition, 5th Edition, 2013.
2. Douglas E Comer, "Internet working with TCP/IP Principles, Protocols, and Architecture-Volume I" 6th Edition, Prentice Hall of India.
3. Dimitri Bertsekas, Robert Gallager, "Data Networks", PHI Publication, Second Edition.
4. Kaveh Pahlavan, Prashant Krishnamurthy, "Networking Fundamentals", Wiley Publication. First Edition, 2009.
5. Ying-DarLin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", McGrawHill.2011.
6. Behrouz A. Forouzan, "Data Communication and Networking", McGraw Hill, 5th Edition, 2013.
7. WilliamStallings, "DataandComputerCommunication"8thEdition, 2007.
8. W. Richard Stevens. "TCP/IP Illustrated, Volume1", Addison Wesley, United States of America.

List of Experiments:

1. Study of different types of LAN & Networks Equipment.
2. Study of various transmission media.
3. LAN installations and Configurations.
4. Installation of Cisco Packet Tracer.
5. Design various Network Topologies using packet tracer.
6. Write a program to implement various types of error detection and correcting techniques.
7. Write a program to implement Bits tuffing.
8. Write a program to implement Dijkstra's shortest path algorithm.
9. Configuring IP addresses and Subnet Mask Using CICSO Packet Tracer.
10. Simulate TCP: Transmission Control Protocol3-way handling using Wires hark.
11. Write a program to implement client server using socket programming.
12. Study of application layer protocols-DNS, FTP, SMTP, SNMP and HTTP.
13. Configure various networking devices using CISCO Packet Tracer.

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IV Semester

LC-CL07(P)	**Analysis & Design of Algorithm**	**0L:0T:2P(2hrs.)**	**Credits:01**

Prerequisite: Data Structure & Algorithm

Course Objective:

Gain problem analysis and solution design skills, implement efficient algorithms for specific applications, and enhance the ability to identify and apply appropriate algorithms in real-world scenarios, emphasizing the importance of algorithms and their complexities.

Course Contents:

Module1:

Designing algorithms, analyzing algorithms. Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, Finding maximum and minimum, merge sort, quick sort.

Module2:

Study of Greedy strategy, examples of greedy method like optimal merge patterns, minimum spanning trees, single source shortest path algorithm.

Module3:

Concept of dynamic programming, problems based on this approach such as 0/1knapsack, Sum of subset problems, Floyd- Warshall algorithm.

Module4:

Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle. Introduction to branch &bound method, examples of branch and bound method like traveling salesman problem etc.

Module5:

Binary search trees, height balanced trees, basic search and traversal techniques for trees and graphs (In order, preorder, post order, DFS, BFS).

Course Outcomes:

1. Solve and analyze the problems using divide and conquer method.
2. Solve and analyze the problems using greedy methods.
3. Solve and analyze the problems using dynamic programming.
4. Apply backtracking and branch & bound method to solve various problems.
5. Develop programs for Tree and Graph traversal and analyze its time complexity.

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List of Text Books/Reference Books:

1. Coremen Thomas, Leiserson CE, Rivest RL, "Introduction to Algorithms"3rdEd, 2009 PHI.
2. Horowitz & Sahani, "Analysis & Design of Algorithm" Computer Science Press
3. Ullmann, "Design &Analysis of Computer Algorithms" Pearson
4. Michael T Goodrich, Robarto Tamassia,"Algorithm Design", Wiely India
5. Rajesh K Shukla, "Analysis and Design of Algorithms: A Beginner's Approach", Wiley

List of Experiments:

1. Write a program to perform Quick Sort for the given list of integer values.
2. Write a Program to perform Merge Sort on the given lists of integer values.
3. Write a program for finding the maximum and minimum value from list.
4. Write a program for minimum spanning trees using Kruskal's algorithm.
5. Write a program for minimum spanning trees using Prim's algorithm.
6. Write a program for Single source shortest path.
7. Write a program for 0/1knapsack problem.
8. Write a program for All Pair Shortest Path.
9. Write a program for Sum of subset problem.
10. Write a program to solve N-QUEENS problem.
11. Write a program to solve the Hamiltonian cycle problem.
12. Write a program to solve Traveling salesman problem.
13. Write a program for Tree traversal (Inorder, Preorder, Postorder).
14. Write a program for Depth First Search Graph Traversal.
15. Write a program for Breadth First Search Graph Traversal.

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IV Semester

LC-CL08(P)	**Operating System Lab**	**0L:0T:2P(2hrs.)**	**Credits:01**

Prerequisite:

Course Objective:

To equip students with a comprehensive understanding of the fundamental concepts and mechanisms in operating systems, focusing on process management, memory management, and file systems.

Course Contents:

Module1:

Process Management: CPU Scheduling, FCFS, Convoy Effect, FCFS with Overhead, SJF, SRTF, Round Robin Algorithm, Longest Job First, Priority Scheduling.

Module2:

Synchronization: Producer Consumer, Reader Writers, Dining Philosophers Problem, Banker's algorithms.

Module3:

Memory Management: Page replacement algorithm, Belady's Anomaly, Stack algorithms, Deadlock.

Module4:

File system IO: Disk scheduling (FCFS, SSTF, Scan, C-scan, Look, C-look).

Module5:

Threads and system calls: Communications related system calls

Course Outcome:

1. Understand process management and implement CPU scheduling for efficient resource utilization.
2. Implement synchronization mechanisms to prevent concurrency problems and deadlocks
3. Implement paging and page replacement algorithms.
4. Apply various disk scheduling algorithms.
5. Understand system calls, threads, and advanced OS concepts in network.

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IV Semester

List of Text/Reference Books:

1. Operating System Concepts Essentials by Avi Silbers chatz, Peter Galvin, and Greg Gagne (10th Edition, 2018).
2. Modern Operating Systems by Andrew S. Tanenbaum(3rdEdition,2007).
3. Understanding the Linux Kernel by Daniel P.Bovet and Marco Cesati(3rdEdition).
4. William Stallings' Operating Systems: Internals and Design Principles (5thEdition,2005).
5. Operating Systems: A Modern Perspective by Gary J. Nutt(2ndEdition).

List of Experiment:

Write a program:

1. To implement FCFS CPU scheduling algorithm.
2. To implement SJF CPU scheduling algorithm.
3. To implement Priority CPU Scheduling algorithm.
4. To implement Round Robin CPU scheduling algorithm.
5. To compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. To implement classical, inter process communication problem (producer consumer).
7. To implement classical, inter process communication problem (Reader Writers).
8. To implement classical, inter process communication problem (Dining Philosophers).
9. To implement Banker’s algorithms.
10. To implement & compare various page replacement algorithms.
11. To implement & compare various Disk & Drum scheduling Algorithms.
12. To implement Remote Procedure Call (RPC).

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IV Semester

LC-CL09(P)	**Advanced Python**	**0L:0T:4P(4hrs.)**	**Credits:02**

Prerequisite: Fundamental of Python

Course Objective: The students will try to learn:

1. The programming skills in advanced Python.
2. The Object-oriented programming skills in Python.
3. An ability to utilize libraries of Python to solve real life problems.

Course Contents:

Module 1:

Advanced Functions: Introduction to Functional Programming, functions as Objects, LambdaFunctions, List Comprehensions, List Comprehensions with Sequence Processing: Map, Filter and reduce Function, Iterators, Generators, Recursion, Closed Function and Function Annotators or Decorators.

Module 2:

Object Oriented Programming: Classes and Objects, Class Attributes, Methods in class: private methods, Constructor, Destructor. Built-ins: Built-in methods in class, Built-in Attributes in Objects.

Module 3:

Modules in Python: Introduction to Modules and Packages in Python, Creation of a Modules, Importing Modules, Uses of Standard Modules in Python: Math and Sympy Packages, os Module, sys Module, py_compile, Packages.

Module 4:

Errors and Exceptions: Introduction to Errors and Exceptions, Handling Exceptions, Multiple Exceptions, Raising Exceptions, Exceptions Chaining, Built-In Exceptions, User- Defined Exceptions, Clean-Up Actions.

Module 5:

Introduction to Data Analytics with Python: Introduction to Data Analysis, Dataset and Data Anatysis, Arrays in Python, Introduction to NumPy, Pandas, Data Visualization Using Pandas and Matplotlib, Scikit-Learn and Data Analysis.

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Course Outcome:

1. Apply Collection modules for the data types.
2. Implement Object Oriented concepts in programming.
3. Develop Module(s) and Package(s) in python.
4. Apply exception handling and user defined exception(s).
5. Make use of Pandas and Numpy Libraries.

List of Text/Reference Books:

1. Python Programming (Pearson), S. Sridhar, J. Indumathi, V. M. Hariharan.
2. Martin C.Brown(Author),"Python: The Complete Reference" McGraw Hill Education, Fourth edition , 2018
3. R. Nageswara Rao, "Core Python Programming" Dreamtech Press India Pvt Ltd 2018.
4. Michael H Goldwasser, David Letscher, "Object Oriented Programming in Python", Prentice Hall, 1st Edition, 2007.
5. Dainel Y.Chen" Pandas for Everyone Python Data Analysis" Pearson Education, 2019.

List of Experiment:

1. Generate prime numbers in the range 0-20 using list comprehension.
2. Write a recursive program to find the Greatest Common Divisor of the two integer numbers.
3. Write a program to read, add, display and subtract two matrices using OOP.
4. Write a program to calculate area,perimeter and height of the triangle using the concept of classes and objects
5. Create a module that holds the functions for finding the number of different ways the various combinations of words can be given with a single word.
6. Construct a python script that finds the lam for the input numbers through the command line arguments.
7. Write a python program to demonstrate raising exceptions for a Zero Division Error
8. Write a python script for handling File Not Found Error Exceptions.
9. Write a python program to implement Pandas Series with labels.
10. Using Numpy, find the five-point summary of the following list of numbers.
    A=[10 40 60 100 120 140]

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SBC-CL01(P)	Web Development Technology	0L:0T:2P(2hrs.)	Credits:01

Prerequisite:

Course Objective:

1. Capable of applying and implementing concepts of HTML in the web page.
2. Apply concepts of CSS to provide effective presentation to the HTML pages.

Course Contents:

Module1:

The basics of Internet, Web Client vs Web Servers, World Wide Web, FTP, HTTP vs HTTPS, Introduction to HTML, History, HTML Tags and Attributes, HTML Tag vs Element, HTML: Basic Tags, Lists, Images, Hyperlink, Table, Introduction and Advantages of HTML 5, HTML5 Web Forms, HTML5 Media (Video & Audio)

Module2:

Introduction to Cascading Style Sheets, Creating Style Sheet, CSS Selectors, Introduction to CSS3: Border and box effects, Background Images, 2D & 3D Transformation, Transition and animation, Multi Column Layout, Introduction to CSS library framework.

Module3:

CSS2-Introduction: Benefits of CSS, CSS Versions History, CSS Syntax, External Style Sheet using, Multiple Style Sheets, Value Lengths and Percentages. Linking to a CSS, Creating an Internal Style Sheet, ID and Class CSS-Syntax: CSS Syntax, single Style Sheets Multiple Style Sheets, Value Lengths and Percentages.

Module4:

CSS-Selectors: ID Selectors, Class Selectors, Grouping Selectors, Universal Selector, Descendant / Child Selectors, Attribute Selectors, CSS – Pseudo Classes, CSS Background and Text Properties: Image, Color, CSS Cursor, Inline Styling, Linking external style sheet: Box model, CSS Tables.

Module5:

Introduction to Bootstrap : What is Bootstrap Framework, History of Bootstrap, Advantages of Bootstrap Framework, What is Responsive web page, How to remove Responsiveness, Major Features of Bootstrap, What is Mobile-First Strategy, Setting up Environment, How to apply Bootstrap to Applications.

IPS Academy, Institute of Engineering &Science

(A UGC Autonomous Institute, Affiliated to RGPV, Bhopal) Scheme Based on AICTE Flexible Curriculum

Department of Computer Science & Engineering- AIML

Bachelor of Technology (B.Tech.)

IV Semester

Course Outcome:

1. Create the HTML documents using syntax of HTML.
2. Construct and design HTML pages.
3. Understand the concept of CSS.
4. Learn about different Selectors through CSS.
5. Learn about Bootstrap Introduction, how to design webpage look and feel good by using Bootstrap and the basics of Bootstrap Framework using which you can create web projects.

List of Experiments:

1. Create Web Page with HTML5 & CSS3.
2. Study anchor tag (<a>tag/Hyperlink) with other page and same page. Write an HTML page for Image Formatting. Use image as a Hyperlink.
3. Create HTML page with list and also some of nested list.
4. Create HTML page to study<form>tag and all for min put tags.
5. Create Simple HTML page with a DIV and Span tag. Also understand the difference between div and span.
6. Write a CSS using in line CSS, Embedded CSS, External CSS.
7. Study the concept of selectors (HTML tag selector, Class selector and ID selector).
8. Implement CSS2.0 with all types with Background, Display, Font, Position, Text, Floating, Table, List properties.
9. Implement Box model using properties like Border, Margin, Padding, Height, and Width.
10. How to apply Boot strap to Application.

List of Text/Reference Books:

1. HTML & CSS: The Complete Reference, Fifth Edition by Thomas Powell.
2. Beginning HTML5 and CSS3: The Web Evolved.
3. CSS Pocket Reference, 5th Edition by Eric Meyer Released April 2018 Publisher(s):O'Reilly Media, Inc. ISBN: 9781492033394.
4. UnravelingBootstrap3.3, Istvan Novak.