

P.T.V.A.'s

M.L. Dahanukar College of Commerce (Autonomous)

Teaching Plan: 2026- 27

Department: I.T.

Class: B.Sc. (I.T.)

Semester: III

Subject: Programming with Python

Name of the Faculty: Mrs. Archana Talekar

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Unit I • Introduction • Variables and Expressions • Conditional Statements • Looping • Control statements • Functions: Function Calls, Math Functions, Function Definitions and Uses, Parameters and Arguments, Return Values, Boolean Functions		10
July	Unit II • Strings: Sequence, Traversal with for Loop, String Slices, Searching, Looping, Counting, String Methods, Comparison, Operations • Lists • Sets • Tuples and Dictionaries • Files		12
August	Unit III • Exceptions • Regular Expressions • Classes and Objects • Multithreaded Programming • Modules		12
September	Unit IV • Creating the GUI Form and Adding Widgets • Layout Management • Look and Feel Customization • Storing Data in Our MySQL Database via GUI		11

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Semester: III

Subject: Data Structures and Algorithms

Name of the Faculty: Ms. Siddhi Kasare

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	<u>Module I: Introduction to Data Structure and Array:</u> Introduction: Data and Information, Data Structure, Classification of Data Structures, Primitive Data Types, Abstract Data Types, Operations on Data Structure, Algorithm, Importance of Algorithm Analysis, Complexity of an Algorithm, Asymptotic Analysis and Notations, Big O Notation, Big Omega Notation, Big Theta Notation, Rate of Growth. Array: Introduction, One Dimensional Array, Memory Representation of One-Dimensional Array, Traversing, Insertion, Deletion, Searching, Sorting, Merging of Arrays, Multidimensional Arrays, Memory Representation of Two-Dimensional Arrays, General Multi-Dimensional Arrays, Sparse Arrays, Sparse Matrix, Memory Representation of Special kind of Matrices, Advantages and Limitations of Arrays.		10
July	<u>Module II: Linear Data Structure:</u> Linked List: Linked List, One-way Linked List, Two-way Linked List, Circular Linked List and Header Linked List, Applications of the Linked List. Operation on Linked List: Traversal of Linked List, Searching, Memory Allocation and De-allocation, Insertion in Linked List, Deletion from Linked List, copying a List into Other List, Merging Two Linked Lists, Splitting a List into Two Lists. Stack: Introduction, Operations on the Stack Memory Representation of Stack, Array Representation of Stack, Applications of Stack, Evaluation of Arithmetic Expression, Matching Parenthesis, infix and postfix operations, Recursion. Queue: Introduction, Queue, Operations on the Queue, Memory Representation of Queue, Array representation of queue, Linked List Representation of Queue, Circular Queue, Deque, Priority Queue, Application of Priority Queue, Applications of Queues.		15
August	<u>Module III: Non-Linear Data Structure:</u> Tree: Tree, Binary Tree, Properties of Binary Tree, Memory Representation of Binary Tree, Operations Performed on Binary Tree, Reconstruction of Binary Tree from its Traversals, Huffman Algorithm, Binary Search Tree, Operations on Binary Search Tree, Heap, Memory Representation of Heap, Operation on Heap, Heap Sort.		15

	Advanced Tree Structures: Red Black Tree, Operations Performed on Red Black Tree, AVL Tree, Operations performed on AVL Tree, 2-3 Tree, B-Tree, Threaded Binary Trees, Traversing a Threaded Binary Tree. Graph: Introduction, Graph, Graph Terminology, Paths and Cycles, Isomorphic Graphs, Memory Representation of Graph, Adjacency Matrix Representation of Graph, Adjacency List or Linked Representation of Graph, Operations Performed on Graph, Euler Paths and Hamiltonian Cycles, Graph Traversal, Applications of the Graph, Reachability, Shortest Path Problems: Dijkstra Algorithm and Bellman Ford's Algorithm, Spanning Trees, Minimum Spanning Tree: Prims Algorithm and Kruskal		
September	Module IV: Sorting, Searching, Hashing Techniques and File Organization: Sorting: Bubble, Selection, Insertion, Merge and Quick Sort. Searching: Linear and Binary Search. Hashing Techniques: Hash function, Address calculation techniques, Common hashing functions Collision resolution, Linear probing, Quadratic, Double hashing, Bucket hashing, Deletion and Rehashing. Files and Their Organization: Introduction, File Organization, Indexing.		10

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Semester: III

Subject: Network Architecture and Protocols

Name of the Faculty: Dr. Gayatree Karnik

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	<u>Unit I: Introduction to Computer Networks:</u> Computer Network: Definition of Computer Network, Need of Computer Network, Advantages and Disadvantages of Computer Network, Different types of Computer Networks LAN, MAN, and WAN. Different types of Topology. Network Models: Protocol layering, TCP/IP protocol suite, The OSI model. Network Hardware: Network Interface Card (NIC), Modem, Hub, Switch, hub, Bridge, Router, Gateway.		8
July	<u>Unit II: Introduction to Data Signal:</u> Introduction to the physical layer: Types of signals, Analog signals, digital signals, transmission impairment, Data Transmission, Parallel Communication, and Serial Communication. Introduction to the Data Link Layer: Link layer addressing, Data Link Layer Design Issues, Error detection and correction code and Technique. Transmission media: Guided Media, Unguided Media.		12
August	<u>Module III: Switching and Routing:</u> Introduction to Switching: Structure of a Switch, Types of Switching. Network Layer: IPv4 Addresses, IPv4 Protocol, IPv6 Addresses, IPv6 Protocol, ARP, ICMP. Routing: Introduction, routing algorithms, RIP, OSPF, BGP.		12
August-September	<u>Unit IV: TCP and Application Protocols:</u> Introduction of Transport Layer: Introduction, Transport layer protocols (Simple protocol, Stop-and-wait protocol, Go- II Back-n protocol, Selective repeat protocol.) Transport Layer Protocol: UDP, TCP, DHCP. Application Layer: WWW, HTTP, DNS, SMTP, POP3, TELNET, FTP.		12

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Semester: III

Subject: Principles of Linear Algebra

Name of the Faculty: Ms. Roshni Ahir

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Row Echelon Form (REF), Reduced Row Echelon Form (RREF), Rank of Matrix		3
	Homogeneous & Non-Homogeneous System of Linear Equations		3
July	Row & Column Vectors, Vector Addition, Scalar Vector Multiplication		4
	Combination of Vector Addition & Scalar Multiplication, Length of Vector		3
	Distance Between Two Vectors, Angle Between Two Vectors		3
August	Vector Equations, Linear Combination, Linear Independence, Span of Set of Vectors		3
	Characteristic Polynomial (Degree 2 & 3), Eigen Values & Eigen Vectors		3
September	Properties of Eigen Values & Eigen Vectors, Cayley–Hamilton Theorem, Diagonalization		4
	Linear Mapping, Kernel & Range, Null Space & Column Space		3
October	Inner Product & Orthogonality		4

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Semester: III

Subject: Entrepreneurship Management

Name of the Faculty: Ms. Sneha Chavan

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Unit I Foundation of Entrepreneurship Management: Meaning of Entrepreneur: Concept, Characteristics, Functions, Barriers to entrepreneurship, Entrepreneurial Management – Concept, Elements, Significance, Factors, Dimensions, Entrepreneurial Culture- Concept, Ways to develop entrepreneurial culture. Ethical considerations in developing entrepreneurship	Case Study	05
July	Theories of Entrepreneur - Joseph Schumpeter, K H Knight, Everett Hagen, Socio cultural, Political, Economic Influence on entrepreneurial development, Institutional support to entrepreneurs -EDII , SIDO, Start up India Initiatives , Incubation Centers. Unit II Types of Entrepreneurs : Intrapreneur – Meaning and Features, Distinguish between Intrapreneur and Entrepreneur, Women Entrepreneur – Concept, Problems, initiatives for development of women entrepreneurs	Presentation	15
August	Self Help Groups – Concept, Role, Social Entrepreneurship – Concept, Importance, Measures for development of Social Entrepreneurs, NGOs – Concept, Role of NGO's in promoting entrepreneurship, Entrepreneurship Development Program- Meaning, Objective, Elements, Factors influencing EDP, Options available to entrepreneur -Ancillarisation, Merger, Acquisition, BPO, Franchise- Concept only Case Study of Successful Entrepreneurs in India. Creativity and Business Idea Development, IPR- Types, Benefits, Feasibility Analysis of Business Idea, Development of Business Plan, strategies for growth of entrepreneurship. Entrepreneurial sickness and rehabilitation	Group Discussion & Quiz	10

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Semester: III

Subject: Modern Operating Systems

Name of the Faculty: Mrs. Snehal Borade

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Unit I :- Operating System Overview Objectives and functions, operating system services, User and operating system interface, system calls, types of system calls, system service, Evolution, operating system design and implantation, operating system structure, modern operating system. Process Description and Control What is process? Process States, Process Description, process control block, process controlling, operations on processes, interprocess communication. Thread Processes and Threads, Types of threads, multicore programming models, thread libraries.		14
July	Unit II: -Concurrency: Mutual Exclusion and synchronization Mutual Exclusion: Software approaches, Race Condition, Process Interaction, Requirements of Mutual Exclusion, semaphores, Monitors, Messages Passing, Readers/Writers Problem. Deadlock and Starvation: Principals of Deadlock, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock, Dining Philosophers Problem.		12
August	Unit III:- Memory and Scheduling: Logical address space, physical address space, memory management techniques, Paging and Segmentation. Virtual Memory: Paging, Segmentation, Page Replacement algorithm, Thrashing Uniprocessor Scheduling: Basic Concept, Types of Processor Scheduling, Criteria, Scheduling Algorithm. Multiprocessor and Real Time Scheduling:		10

	Granularity, Design Issues Processor and Thread Scheduling, Real Time Scheduling Algorithm		
September	Unit IV:-IO and File Management, Operating System Security: I/O Management and Disk Scheduling: I/O Devices, Direct Memory access, I/O Buffering Disk Scheduling RAID. File Management: Overview, File Organization and Access, File Directories, File Sharing, Record Blocking, Secondary Storage Management. Operating System Security: The Security Problem, Intruders and Malicious Software, Buffer Control, Access Control.		09

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Semester: III

Subject: Shashkiya Marathi I

Name of the Faculty: Mrs. Priyanka More

Month	Topics to be Covered	Number of Lectures
June	घटक-१ शासकीय मराठीची ओळख आणि महत्त्व १. शासकीय मराठीची व्याख्या व गरज २. प्रशासकीय मराठीचे स्वरूप आणि उपयोग ३. महाराष्ट्रातील शासकीय कार्यालयांमध्ये मराठीचा वापर	06
July	मराठी भाषा आणि संविधान १. अनुच्छेद ३४३, ३४४ आणि ३५१ २. संक्षिप्त लेखन व शब्दकोश वापरण्याचे तंत्र ३. प्रशासकीय मराठीत इंग्रजी ते मराठी अनुवाद तंत्र ४. मराठीत इंग्रजी संज्ञांचे भाषांतर आणि वापर	10
August	घटक-२ शासकीय पत्रव्यवहार व दस्तऐवज लेखन १. शासकीय पत्रव्यवहार आणि दस्तऐवज लेखन २. शासकीय पत्रांचे प्रकार (अनुप्रयोग पत्र, परिपत्रक, निवेदन, स्मरणपत्र) ३. आदेश आणि ठरावलेखन	07
September	अहवाल व अधिकृत दस्तऐवज लेखन १. अहवाल लेखन (वार्षिक अहवाल, तपासणी अहवाल, माहिती अहवाल) २. शिफारसपत्र ३. माहितीच्या अधिकाराखाली अर्जलेखन	07

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