M.L.Dhanukar College of Commerce
Teaching Plan: 2022 - 23

Department**: Information Technology**   Semester: III

Class**: S.Y.B.Sc.I.T.**

Subject**: Python Programming**

Name of the Faculty**: Archana Talekar**

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	**Unit I** • Introduction • Variables and Expressions • Conditional Statements • Looping • Control statements		12
July	**Unit II** • Functions: Function Calls, Math Functions, Functions Definitions and Uses, Parameters and Arguments, Return Values, Boolean Functions • Strings: Sequence, Traversal with for Loop, String Slices, Searching, Looping, Counting, String Methods, Comparison**,** Operations **Unit III** • Lists • Tuples and Dictionaries		18
August	**Unit III** • Files • Exceptions **Unit IV** • Regular Expressions • Classes and Objects • Multithreaded Programming • Modules •		16
September	**Unit V** • Creating the GUI Form and Adding Widgets • Layout Management • Look and Feel Customization • Storing Data in Our MySQL Database via Our GUI		14

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Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	**Unit I** **Chap 1: Introduction:** Data and Information, Data Structure, Classification of Data Structures, Primitive Data Types, Abstract Data Types, Data structure vs. File Organization, Operations on Data Structure, Algorithm Complexity of an Algorithm, Asymptotic Analysis and Notations, Big O Notation, Big Omega Notation, Big Theta Notation, Rate of Growth and Big O Notation. **Chap 2: Array**: Introduction, One Dimensional Array, Memory Representation of One-Dimensional Array, Traversing, Insertion, Deletion, Searching, Sorting, 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.		12
July	**Unit II** **Chap 3: Linked List:** Linked List, One-way Linked List, Traversal of Linked List, Searching, Insertion in Linked List, Deletion from Linked List, Copying a List into Other List, Circular Linked List, Applications of Circular Linked List, Two way Linked List, Traversing a Two way Linked List, Searching in a Two way linked List, Insertion of an element in Two way Linked List, Deleting a node from Two way Linked List, Header Linked List, Applications of the Linked list, Storage of Sparse Arrays, Implementing other Data Structures. **Unit III** **Chapter 5:** **Queue:** Introduction, Queue, Operations on the Queue, Memory Representation of Queue, Array representation of queue, Linked List Representation of Queue, Circular Queue, Some special kinds of queues, Deque, Priority Queue, Application of Priority Queue, Applications of Queues. **Chapter 4:** **Stack**: Introduction, Operations on the Stack Memory Representation of Stack, Array Representation of Stack,		22

	Applications of Stack, Evaluation of Arithmetic Expression, Matching Parenthesis, infix and postfix operations, Recursion.		
August	**Unit IV** **Chap 6: Sorting and Searching Techniques** Bubble, Selection, Insertion, Merge Sort. **Chap 7: 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. **Unit V** **Chapter 9:** **Hashing Techniques** Hash function, Address calculation techniques, Common hashing functions Collision resolution, Linear probing, Quadratic, Double hashing, Bucket hashing, Deletion and rehashing. **Chapter 10: Graph**: Introduction, Graph, Graph Terminology, Memory Representation of Graph, Adjacency Matrix Representation of Graph, Adjacency List or Linked Representation of Graph, Operations Performed on Graph, Graph Traversal, Applications of the Graph, Reachability, Shortest Path Problems, Spanning Trees.		20
September	**Unit IV** **Chapter 8:** **Advanced Tree Structures:** Red Black Tree, Operations Performed on Red Black Tree, AVL Tree, Operations performed on AVL Tree, 2-3 Tree, B-Tree.		6

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M.L. Dahanukar College of Commerce
Teaching Plan: 2022 - 23
Department: I.T.   Class: S.Y.B.Sc.(I.T.)   Semester:III
Subject: Computer Network
Name of the Faculty: Amit Bane

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	1.Data communications, networks, network types, Internet history,standards and administration. 2.Protocol layering, TCP/IP protocol suite, The OSI model. 3.Data and signals, periodic analog signals, digital signals, transmission impairment, data rate limits, performance. 4.Digital-to-digital conversion, analog-to-digital conversion, transmission modes, digital-to-analog conversion, analog-to-analog conversion.		14
July	1.Multiplexing, Spread Spectrum 2.Guided Media, Unguided Media 3.Introduction, circuit switched networks, packet switching, structure of a switch. 4.Link layer addressing, Data Link Layer Design Issues, Error detection and correction, block coding, cyclic codes, checksum, forward error correction, error correcting codes, error detecting codes. 5.DLC services, data link layer protocols, HDLC, Point-to-point protocol. 6.Random access, controlled access, channelization, Wired LANs – Ethernet Protocol, standard ethernet, fast ethernet, gigabit ethernet, 10 gigabit ethernet,		20
August	1.Introduction, IEEE 802.11 project, Bluetooth, WiMAX, Cellular telephony, Satellite networks. 2. Network layer services, packet switching, network layer performance, IPv4 addressing, forwarding of IP packets, Internet Protocol, ICMPv4, Mobile IP 3.Introduction, routing algorithms, unicast routing protocols. 4.IPv6 addressing, IPv6 protocol, ICMPv6 protocol, transition from IPv4 to IPv6. 3.Introduction, Transport layer protocols (Simple protocol, Stop-and-wait protocol, Go-Back-n protocol, Selective repeat protocol, Bidirectional protocols)		20
September	1. Transport layer services, User datagram protocol, Transmission control protocol. 2. World wide-web and HTTP, FTP, Electronic mail, Telnet, Secured Shell, Domain name system.		06

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M.L. Dahanukar College of Commerce
Teaching Plan: 2022 - 23
Department: I.T.   Class: S.Y.B.Sc.(I.T.)   Semester:III

Subject: Database Management System

Name of the Faculty: Supritha Bhandary

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Introduction to database and transactions What is database system, purpose, view of data, relational databases, database architecture Data models: importance, business rules, degree of data abstraction. Database design and ER Model		12
July	Codd's rule, Relational data model Logical view of data, keys, integrity rules, relational database design, atomic domain and normalization, Relational Algebra and calculus, selection and projection, set operations, joins, tuple relational calculus.		18
August	Constraints and views: types of constraints, data independence, security, aggregate functions, NULL values, triggers, Transaction Management and concurrency, ACID properties, serializability and concurrency control, 2PL, time stamping methods, database recovery management.		16
September	PL-SQL: Identifiers and keywords, sequences, control structures, cursors, collections and composite data types, exception handling, procedures, functions, packages		14

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M.L. Dahanukar College of Commerce
Teaching Plan: 2022- 23

Department: I.T.   Class: S.Y.B.Sc.(I.T.)   Semester: III

Subject: Database Management Systems

Name of the Faculty: Navneet Kaur Nagpal

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	What is database system, purpose, applications, advantages, file processing system, types of database users, DBA ,data abstraction, instances and schema, business rules, database architecture, data models, DDL, DML, DCL, DQL		16
July	ER data model, constraints on relationship, types of attributes, ER diagrams, weak entity sets, strong entity sets, generalization, specialization, basic building block, codd's rules, UML, types of database keys, integrity rules, Normalization and types of normal forms, relational database, Relational algebra, operations(select, project, composition, rename, join, division, grouping, set operations), tuple calculus, domain calculus, calculus vs algebra		24
August	integrity constraints, pattern matching test ,views, joins, aggregate functions, null values, subqueries, nested subquery, transaction management, process of transaction, ACID properties, serial transaction, concurrent transaction, problems due to concurrent transaction, states of transaction, serializability, lock based protocol(shared mode and exclusive mode), two phase locking protocol, deadlock, timestamp, deadlock prevention, deadlock detection recovery, database recovery management		20
September	Pl/sql, variable declaration, variable scope, constants, comments, % type attributes, sequence, control structure(if , if then else, case, loop, while, for, goto), cursors(implicit, explicit), exception handling, package, procedure, function, trigger		20

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M.L. Dahanukar College of Commerce
Teaching Plan: 2022-23

Department: I.T   Class: S.Y.B.Sc (I.T)   Semester: III

Subject: Applied Mathematics   Name of Faculty: Mohammad Tahir Ansari

Month	Topics to be covered	Internal Assessment	Number of Lectures
JUNE	**UNIT I** Inverse of a matrix, Properties of matrices, Elementary Transformation, Rank of Matrix, Echelon or Normal Matrix, Inverse of matrix, Linear equations, Linear dependence and linear independence of vectors, Linear transformation, Characteristics roots and characteristics vectors, Properties of characteristic vectors, Caley-Hamilton Theorem, Similarity of matrices, Reduction of matrix to a diagonal matrix which has elements as characteristics values.		10
July	**UNIT I** Complex number, Equality of complex numbers, Graphical representation of complex number(Argand's Diagram), Polar form of complex numbers, Polar form of x+iy for different signs of x,y, Exponential form of complex numbers, Mathematical operation with complex numbers and their representation on Argand's Diagram, Circular functions of complex angles, Definition of hyperbolic function, Relations between circular and hyperbolic functions, Inverse hyperbolic functions, Differentiation and Integration, Graphs of the hyperbolic functions, Logarithms of complex quality, j(=i)as an operator(Electrical circuits) **UNIT II** Equation of the first order and of the first degree: Separation of variables, Equations homogeneous in x and y, Non-homogeneous linear equations, Exact differential Equation, Integrating Factor, Linear Equation and equation reducible to this form, Method of substitution. Differential equation of the first order of a degree higher than the first: Introduction, Solvable for p (or the method of factors), Solve for y, Solve for x, Clairaut's form of the equation, Methods of Substitution, Method of Substitution.		16

| August | **UNIT II**
Linear Differential Equations with Constant Coefficients: Introduction, The Differential Operator, Linear Differential Equation f(D) y = 0, Different cases depending on the nature of the root of the equation f(D) = 0, Linear differential equation f(D) y = X, The complimentary Function, The inverse operator 1/f(D) and the symbolic expiration for the particular integral 1/f(D) X; the general methods, Particular integral : Short methods, Particular integral : Other methods, Differential equations reducible to the linear differential equations with constant coefficients.

UNIT III
The Laplace Transform: Introduction, Definition of the Laplace Transform, Table of Elementary Laplace Transforms, Theorems on 12 13 Important Properties of Laplace Transformation, First Shifting Theorem, Second Shifting Theorem, The Convolution Theorem, Laplace Transform of an Integral, Laplace Transform of Derivatives, Inverse Laplace Transform: Shifting Theorem, Partial fraction Methods, Use of Convolution Theorem, Solution of Ordinary Linear Differential Equations with Constant Coefficients, Solution of Simultaneous Ordinary Differential Equations, Laplace Transformation of Special Function, Periodic Functions, Heaviside Unit Step Function, Dirac-delta Function(Unit Impulse Function), | | 16 |
| September | **UNIT IV**
Multiple Integrals: Double Integral, Change of the order of the integration, Double integral in polar co-ordinates, Triple integrals. Applications of integration: Areas, Volumes of solids.

UNIT V
Beta and Gamma Functions –
 Definitions, Properties and Problems. Duplication formula. Differentiation Under the Integral Sign
Error Functions | | 18 |

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