SYLLABUS COMPLETION REPORT – DEPARTENT OF COMPUTER SCIENCE

ACADEMIC YEAR 2019-20

Teacher Name: Mr. I. K. Mujawar				
Class	**Subject**	**Total Units**	**Completed Units**	**Remaining Units**
B.Sc Ist Year (Sem I)	Database Management System	**4**	**Introduction to DBMS:** Introduction of DBMS – Database, DBMS – Definition, Overview of DBMS, File processing system vs DBMS, Limitation of file processing system, Advantages of DBMS, Levels of abstraction, Data independence, DBMS Architecture, Users of DBMS, Data models - Object Based Logical Model, Record Based Logical Model (relational, hierarchical, network) **Entity Relationship Model** - Entities, attributes, entity sets, relations, relationship sets, Additional constraints (key constraints, participation constraints, weak entities, aggregation / generalization, Conceptual Design using ER (entities VS attributes, Entity Vs relationship, binary Vs ternary, constraints beyond ER), Entity Relationship Diagram (ERD) **MySQL -** DDL Statements - Creating Databases, Using Databases, MySQL datatypes, Creating Tables (with integrity constraints – primary key, default, check, not null), Altering Tables, Renaming Tables, Dropping Tables, Truncating Tables, Backing Up and Restoring databases DML Statements – Viewing the structure of a table insert, update, delete, Select – all columns, specific columns, unique records, conditional select, in clause, between clause, limit, aggregate functions (count, min, max, avg, sum), group by clause, having clause. Functions – String Functions (concat, instr, left, right, mid, length, lcase/lower, ucase/upper, replace, strcmp, trim, ltrim, rtrim), Math Functions (abs, ceil, floor, mod, pow, sqrt, round, truncate) Date Functions (adddate, datediff, day, month, year, hour, min, sec, now, reverse) DCL Statements (creating/dropping users, privileges introduction, granting/revoking privileges, viewing privileges)	**NIL**
B.Sc Ist Year (Sem II)	Database Management System -II	3	**Relational data model**– Domains, attributes, Tuples and Relations, Relational Model Notation, Characteristics of Relations, Relational Constraints - primary key, referential integrity, unique constraint, Null constraint, Check constraint **ER to The Relational Model** - Entity to Table, Relationship to tables with and without key constraints. **Introduction to Functional Dependencies and Normalization –** 1NF, 2NF, 3NF **Relational Algebra** operations (selection, projection, set operations union, intersection, difference, cross product, Joins –conditional, equi join and natural joins, division) **MySQL Joining Tables** – inner join, outer join (left outer, right outer, full outer) **Subqueries** – sub queries with IN, EXISTS, sub queries restrictions, Nested sub queries, ANY/ALL clause, correlated sub queries **Database Protection:** Security Issues, Threats to Databases, Security Mechanisms, Role of DBA, Discretionary Access Control **MySQL** – Stored functions, procedures, cursor, trigger, views (creating, altering dropping, renaming and manipulating views)	**NIL**

B.Sc III[rd] Year (Sem V)	PHP and MySQL	4	**Unit-1:Fundamental of PHP (10)** 1.1 Concept of PHP 1.2 Constants, variables declaration 1.3 Comments 1.4 Data types 1.5 Operators 1.6 Command line arguments **Unit-2: Branching and Looping statements (10)** 2.1 Conditional statements 2.1.1 If-else 2.1.2 Switch 2.1.3 Ternary operators 2.2 Looping statements 2.2.1 For loop 2.2.2 While loop 2.2.3 Do-while loop **Unit 3: Arrays in PHP (8)** 3.1 Creating arrays 3.2 Inserting elements in arrays 3.3 Retrieving elements from array 3.4 Displaying arrays 3.5 Sorting array elements **Unit-4:Developing Applications in PHP using MySQL (12)** 1.1 Introduction to Databases 1.1.1 Creating database 1.1.2 Creating tables 1.1.3 Inserting values in table **Unit-4:Developing Applications in PHP using MySQL (12)** 1.1.4 Displaying, changing, searching, deleting records from the table 4.2 Developing applications in PHP 4.2.1 Arithmetic operators through GUI 4.2.2 Web calculator 4.2.3 SQL queries- insert, select, delete, update, where, order by.	**NIL**
B.Sc III[rd] Year (Sem VI)	Paper – XIV Java Programming	4	**Unit- I- Introduction To Java** 1.1 History and features of Java Programming 1.2 Difference between Java & C++ 1.3 Java Environment 1.4 Java tokens, constants, variables, data types, type casting 1.5 Operators and Expressions 1.6 Implementing Java Program 1.7 Branching and looping statements 1.8 Class, objects, methods 1.9 Constructors and destructor **Unit-II- Inheritance and Packages** 2.1 Defining sub class, subclass constructor 2.2 Inheritance-Multiple and hierarchical 2.3 Defining packages, system packages 2.4 Creating & accessing packages 2.5 Adding a class to package 2.6 Polymorphism- function overloading and over ridding, its difference **Unit-III- Multithreading and Exception Handling** 3.1 Creating threads, extending a thread class- declaring the class, run() method 3.2 Stopping and blocking threads 3.3 Life cycle of thread 3.4 Using thread method 3.5 Thread priority 3.6 Introduction to exception 3.7 Syntax of exception handling code 3.8 Multiple catch statement 3.9 Using finally statement 3.10 Throwing exception **Unit-IV- Applets Programming & Introduction to AWT** 4.1 Introduction to applets 4.2 Building applet code 4.3 Applet life cycle 4.4 Adding applet code to HTML file 4.5 Introduction to Abstract Window Toolkit (AWT)	**NIL**

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Teacher Name: Ms. J. A. Chavan				
Class	**Subject**	**Total Units**	**Completed Units**	**Remaining Units**
B.Sc IIIrd Year (Sem V)	Paper – XIII Network Technology and Windows Server 2008	4	**Unit-1 Introduction to Computer Network (10)** Definition, Goals, Application, Basic Concept: Entities, Layers, Protocols, Computer Network. Classification Of Computer Network: Transmission Techniques, Scale, Connection Method, Functional Relationship, Network Topology, services provided Protocols, Network Architecture: Protocol Hierarchy, Information flow design issues for the layers, Merits and demerits of layer architecture, service primitives, standardization network. **Unit-2 Data Communication (10)** Objectives, four analysis, Band limited signal, Maximum data rate & channel. Transmission Impairments: Attenuation Distortion, Delay, Dispersion, Noise. Data Transmission modes: Serial & Parallel, Simplex, Half Duplex, Full Duplex & Simplex. Synchronous & Asynchronous Transmission. **Unit-3 Introduction to Windows Server 2008 (10)** Managing Windows Server 2008: 1. Working with administrative tool using control panel, Graphical administrative tool & command line utility. 2. Working with computer management: Computer management system tools, Computer management storage tools, computer management services and application tools. 3. Using system console. **Unit-4 Managing Active Directory (10)** Active Directory Physical Architecture: Top level view, Local security Authority, Directory service architecture, Data storage architecture. Logical Architecture: Object, Domain, Trees & forests Trust. Managing Users & Computers, Managing Domain user account, Types of user, User account policies, Password setting, User account capabilities, Properties & Rights, Create computer account, Organization Chart.	**NIL**

B.Sc III[rd] Year (Sem VI)	Paper – XIII Network Technology and Windows Server 2008	4	**Unit-1 Reference Model** ISO-OSI: principle of layers, data link, Network, Transport, Session, Presentation & Application (Each layer with its function, Protocol, Design issues, Components),TCP/IP: Concept, history, Layers: Host to network, Internetwork, Transport, Application. Comparative study of ISO-OSI & TCP/IP **Unit-2 Physical Layer:** Objective, Network topology, Linear, Ring, Star, Hierarchical. Topology, comparison, consideration when choosing a topology. Switching- Circuit, message, Packet, Implementation of packet switching, Relation between packet size & transmission time. Comparison of switching techniques, Multiplexing: FDM- Frequency division multiplexing, WDM- Wavelength Division Multiplexing, TDM- Time Division Multiplexing, Guided and Unguided Media. **Unit-3 File Sharing and Security:** File sharing essential: Understanding file sharing model, using and finding shares, Hiding & controlling share access, special & administrative shares, Creating and Publishing Shared Folders, Cresting shares by using: Windows explorer Computer Management, Publish shares in active directory Managing Shares Permissions: Understand shares permission, Configuring share permission. Managing File And Folder Permission: File & Folder ownership, permission inheritance for files & folders, Configuring files and folder permission, Auditing files & folder Access. Kerboes protocol. **Unit-4 Managing Group Policy** Managing Group: Understanding group, By default Group, Creating Group, Adding Member To Group, Delete Group, Modifying Group. Understanding Group Policy: Local & Active Directory Group Policy, Group policy setting, Group policy architecture. Implementation Group Policy: Working with local group policy, Group policy management console, Default group policy object, managing group policy inheritance & processing. Group Policy Inheritance, Overriding inheritance, Blocking inheritance, Enforcing inheritance, Filtering group inheritance.	**NIL**

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Teacher Name: Dr. V. B. Waghmare				
Class	**Subject**	**Total Units**	**Completed Units**	**Remaining Units**
B.Sc. III[rd] Year (Sem V)	Paper – X Visual Programming Using C#	4	**Unit -II Introduction (7)** 1.1 Overview, Architecture, Features of .NET , 1.2 Meta data, CLR, Managed and unmanaged code 1.3 CTS, CLS, .NET base classes, JIT Compiler 1.4 Introduction to Visual Studio .NET IDE **Unit -II Introduction To C# (10)** 2.1 Introduction to C#, Entry point method, command line arguments 2.2 Compiling and building projects, Compiling a C# program using command line utility, CSC.EXE, Different valid forms of main. 2.3 Global stack and heap memory, reference type and data type, casting-implicit and explicit 2.4 Boxing and unboxing, pass by value and pass by reference and out parameters 2.5 Partial class, DLL, Difference between DLL and EXE **Unit-III Introduction to Web Programming (13)** 3.1 Understanding role of WEB server and WEB browser, HTTP request and response structure. 3.2 Introduction to ASP, Types of path, FORM tag 3.3 Types of server controls 3.4 Validation controls-Base validator, compare validator, range validator, grouping control validator 3.5 Web forms life cycle. 3.6 Event handling in WEB forms, Response.Redirect, Server.Response, cross page, post back property of button. 3.7 ASP.NET state management 3.8 WEB.config, globalization and localization, AppDomain **Unit-IV ADO .NET (10)** 4.1 Introduction to ADO.Net 4.2 ADO.NET Architecture- Connection, command, data reader, data adapter, data set 4.3 Understanding connected layer of ADO.NET and disconnected layer of ADO.NET	**NIL**
B.Sc. III[rd] Year (Sem VI)	Paper –XVI: E-Commerce	4	**Unit-I: Introduction** 1.1 E-Commerce- Concept, Definition, Goals 1.2 Components and functions 1.3 Advantages and Limitations 1.4 Challenges and opportunities 1.5 E-Commerce models-B2B, C2C, C2B, C2G, B2C, B2B 1.6 EDI- Concept, components, 1.7 Working mechanism of EDI 1.8 Advantages and disadvantages of EDI **Unit-II: Electronic payment System** 2.1 Concept of e-payment 2.2 Difference between traditional and electronics payment system 2.3 Digital cash, cyber cash, e-wallet 2.4 Credit and Debit card system, Smart Card 2.5 Prepaid, post paid and instant payment system 2.6 Electronic funds transfer, NEFT, RTGS **Unit-III: E-Security** 3.1 Concept of E-security 3.2 Security threats- concept and types 3.3 Malicious code 3.4 Phishing and identity theft 3.5 Hacking and cyber vandalism 3.6 Credit card fraud/Theft 3.7 Spoofing 3.8 Denial of service (DoS) 3.9 Firewall and proxy server **Unit-IV: Security Solutions** 4.1 Introduction to Cryptography 4.2 Concept of encryption and decryption 4.3 Symmetric and asymmetric key encryption 4.4 Cipher text 4.5 Digital Envelopes 4.6 Digital certificates 4.7 Security socket layer (SSL) 4.8 Limitations of encryption solutions.	**NIL**

B.Sc. IInd Year (Sem III)	Operating System	4	**Introduction** What Operating Systems Do, Computer-System Organization, Computer-System Architecture ,Operating-System Structure, **Operating-System Operations:** Process Management, Memory Management, Storage Management, Protection and Security Distributed Systems, Special-Purpose Systems, Computing Environments , Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls, System Programs, Virtual Machines, Operating-System Generation, System Boot **Process Management** **Processes-** Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems **Thread-** Threads. **CPU Scheduling-**Scheduling Criteria, Scheduling Algorithms (First-Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling, Multilevel Queue Scheduling) **Introduction to Linux** Linux History and architecture of Linux system, Shell, Types of Shell's, Kernel, Kernel shell relationship, Login, Logout, Remote login, GPU(General Purpose Utilities) clear, script, cal, who, bc, wc, head, tail, inodes, structure of regular file, file manipulation commands, change file access permissions with chmod command, directories, directory management commands- cd, mkdir, rmdir. Simple filters- cut, paste, sort, tr, Advanced filters-sed, grep, gawk	**NIL**
B.Sc. IInd Year (Sem IV)	Operating System	3	**Memory Management** **Main Memory-**Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation , Example: The Intel Pentium, **Virtual Memory-**Demand Paging, Copy-on-Write, Page Replacement (FIFO, Optimal, LRU, MFU,LFU), Allocation of Frames, Thrashing, Memory-Mapped Files **Storage Management** File-System Interface-File Concept, Access Methods, Directory Structure , File-System Mounting , File Sharing , Protection, File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, I/O Systems-I/O Hardware, Application I/O Interface, Kernel I/O Subsystem **Linux Scripting** Writing and running the shell script, read, echo, decisions and loop control structure, file tests, exit, command line arguments, exporting shell variable, arrays, shell function, writing data entry script to create data files, data validations before storing on hard disk.	**NIL**

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Teacher Name: Ms. R. Y. Patil				
Class	**Subject**	**Total Units**	**Completed Units**	**Remaining Units**
B.Sc. IIIrd Year (Sem V)	Paper – XI Linux Operating System	**4**	**Unit -1: Introduction (10)** Linux History and architecture of Linux system, shell, Types of shell's, Operating system services, Kernel, Kernel shell relationship, Login, Logout, Remote login, GPU(General Purpose Utilities) clear, script, cal, who, bc, wc, head, tail. **Unit -2: Handling Buffer Cache, File and Directories (10)** Buffer, headers, structure of the buffer pool, scenarios for retrieval of a buffer, advantage and disadvantage of the buffer cache, inodes, structure of regular file, change file access permissions with chmode command, directories, directory management commands- cd, mkdir, rmdir. **Unit -3: System calls and Process (10)** Open, read, write, process states and transitions, process creation, signals, process termination, a waiting process termination, process management- ps, kill, background processing, no hang up, job scheduling using at command. **Unit -4: VI Editor and simple shell programming (10)** Use and features of vi, modes of operation- a) Commamd mode- text management, repeat factor. b) Insert mode- insert, append, replace text. c) Ex mode- saving the text, global substitution etc. Writing and running the shell script, read, echo, decisions and loop control structure, file tests, exit etc.	**NIL**
B.Sc. IIIrd Year (Sem VI)	Paper – XV Advanced Linux Applications	**4**	**Unit -1: Memory management and advanced VI** Memory management- swapping, demand paging, deleting and moving text (d, p and P), yanking text (y), filtering the text (!), Ex mode- handling multiple files, inserting file and command outputs, moving text from one file to another. **Unit -2: Advanced Filters** Sed – syntax, line addressing, multiple instructions (-e .-f) context addressing, internal commands used by sed –i, a, d, p, r, w, q, s etc., gawk- syntax, field level operations, formatted outputs, use of variables and expressions, BEGIN and END section, built-in variables, arrays, built-in functions- system, length, substr, split etc., types of meta characters. **Unit -3: Advanced shell programming** Shell and subshell, set command, command line arguments, exporting shell variable, arrays, shell function, writing data entry script to create data files, data validations before storing on hard disk. **Unit -4: System administration** Login with root, su, communicate with users-wall, news, booting and shutdown process, mangibg disk space- df, du, ulimit, find, backup- cpio, printer management- lpsched, lpstat, lpadmin, lpmove, reject, disable etc., mounting a file system, unmounting a file system.	**NIL**
B.Sc. Ist Year (Sem I)	Problem Solving using Computers (Python Programming)	**4**	**UNIT-I-Introduction to Programming Languages**: Programming languages-their classification and characteristics, language translators and language translation activities Planning the Computer Program: What is program and programming paradigms Concept of problem Solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Techniques of Problem Solving: Algorithms, Flowcharting, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. **UNIT-II-Building Blocks of Program:** Data, Data Types, Data Binding, Variables, Constants, Declaration, Operations on Data such as assignment, arithmetic, relational, logical or boolean, ternary, bitwise, increment or decrement operators. Introduction to Python Programming: Features,	**NIL**

			Structure of a Python Program(Python Shell Indentations, Comments), Python Interpreter, Writing and executing simple program, Basic Data Types: numbers(int, long, float, complex), strings, Declaring variables, Performing assignments, arithmetic operations, Sequence Control – Precedence of operators, Type conversion, Simple input-output (print(), raw_input(),input()) **UNIT-III- Conditional Statements:** if, if-else, nested if –else Looping: for, while, nested loops, else clause with while and for loop Control statements: Terminating loops, skipping specific conditions(break, continue, pass) Numeric Functions: abs(), ceil(), floor(), max(), min(), pow(), sqrt() String Manipulation: Declaring strings, String immutability, Unicode string (u'String'), escape sequences(\), Operations on String (Concatenation (+), Repetition (*), Slicing ([index]), Range Slicing([start:end] or [:end] or [start:] , Member ship operator (in, not in)), String Functions : capitalize(), len(), lower(), swapcase(), upper()	
B.Sc. Ist Year (Sem II)	Problem Solving using Computers	**3**	**Unit -1 Python File Input-Output**: Opening and closing file, Various types of file modes, reading and writing to files, manipulating directories **Exception Handling** – What is exception, Various keywords to handle exception such try, catch, except, else, finally, raise – **Regular Expressions** – Concept of regular expression, various types of regular expressions, using match function **Unit -2 GUI Programming in Python (using Tkinter/wxPython/Qt) -** What is GUI, Advantages of GUI, Introduction to GUIlibrary, Layout management, Events and bindings, Font, Colors, drawing on canvas (line, oval, rectangle, etc.) Widget such as : Frame, Label, Button, Checkbutton, Entry, Listbox, Message, Radiobutton, Text, Spinbox etc , Layout management, Events and bindings, Font, Colors, drawing on canvas (line, oval, rectangle, etc.) Widget such as : Frame, Label, Button, Checkbutton, Entry, Listbox, Message, Radiobutton, Text, Spinbox etc **Unit -3 Database connectivity in Python** – Installing mysql connector, accessing connector module module, using connect, cursor, execute & close functions, reading single & multiple results of query execution, executing different types of statements, executing transactions, understanding exceptions in database connectivity **Algorithm, Searching and Sorting** – Searching and sorting techniques, Efficiency of algorithms	**NIL**

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Class	**Subject**	**Total Units**	**Completed Units**	**Remaining Units**
B.Sc IInd Year (Sem III)	Object Oriented Programming using Python	4	**Unit-1 Introduction to Object Oriented Programming** Programming Paradigms, What Is Object-Oriented Programming?, Features of OOP, Advantages and disadvantage of OOP, Function Overloading, Operator Overloading, Static and Dynamic Binding, Constructors and Destructors, Techniques of Object-Oriented Programming, When to use OOP?, Applications of OOP. **Unit-2 Classes and Objects** Python Classes, Objects, Specifying attributes and behaviors, instance methods, instance attributes, static methods, constructor, types of constructors(default, parameterized), class methods as alternative constructor, constructor overloading , method overloading. **Unit-3 Inheritance and Polymorphism** Inheritance in Python (Syntax, Advantages,), Access Modifiers in Python, Types of Inheritance (single, multiple, multilevel, hierarchical and hybrid), Polymorphism-Method Overriding, magic methods and Operator Overloading.	**NIL**
B.Sc IInd Year (Sem IV)	Data Structures Using Python	4	**Unit-1 Abstract Data Type** **Introduction:** Abstractions, Abstract Data Types, Data Structures, General Definitions; **The Date Abstract Data Type**: Defining the ADT, Using the ADT, Preconditions and Postconditions, Implementing the ADT; **Bags:** The Bag Abstract Data Type, Selecting a Data Structure, List-Based Implementation; **Iterates**: Designing an Iterator, Using Iterators; **Application:** Student Records, Designing a Solution, Implementation **Algorithm Analysis: Complexity Analysis**: Big-O Notation, Evaluating Python Code; Evaluating the Python List; Amortized Cost; **Application:** The Sparse Matrix, List-Based Implementation, Efficiency Analysis **Unit-2 Linked Structure** **The singly Linked List**: Traversing the node, Searching for a node, Prepending Nodes, Removing Nodes ;**The Bag ADT Revisited:**A linked List Implementation, Comparing Implementations, Linked list iterators; **More Ways to Build a Linked List:**Using a Tail Reference, The sorted linked list; **The Sparse Matrix Revisited** : An array of Lined list implementation, Comparing the Implementations; **Applications :** Polynomials, Polynomial Operations, The Polynomial ADT, Implementation. **Advanced Linked List: The Doubly Linked List:** Organization, List Operations ;**Circular Linked List:** Organization, List Operation Multi-Linked Lists: Multiple Chains, The sparse Matrix ;**Complex Iterators ; Application**: Text Editor, Typical Editor Operations, The EDIT Buffer ADT, Implementation **Unit-3 Stacks** **The Stack ADT:** Implementing the stack, using a python list, using a linked list, Stack Applications: Balanced Delimiters, Evaluating Postfix Expression; **Applications:** Solving a Maze: Backtracking, Designing a solution, The Maze ADT, Implementation **Queues** **The Queue ADT;**Implementing the Queue:Using a Python List, Using a Circular Array, Using a Linked List **Priority Queues:** The priority Queue ADT, Implementation: Unbounded Priority Queue, Implementation :Bounded Priority Queue ;**Application :** Computer Simulation : Airline Ticket Counter, Implementation	**NIL**

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