SYLLABUS COMPLETION REPORT – DEPARTENT OF COMPUTER SCIENCE

ACADEMIC YEAR 2020-21

Teacher Name: Mr. I. K. Mujawar				
Class	Subject	Total Units	Completed Units	Remaining Units
B.Sc Ist Year (Sem I)	Database Management System	3	**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 IIIrd Year (Sem V)	Introduction to JAVA	3	**Introduction to Java and Java Fundamentals:** History of Java , Features of Java , Comparison of Java and C++ , Java Environment, Java Tools – jdb, javap, javadoc ,Java IDE – Eclipse/NetBeans, Structure of java program, ,First java program, Types of Comments, Data types, Variables, Operators, Keywords, Naming Convention, Declaring 1D, 2D array, Decision Making (if, switch),Looping(for, while) ,Type Casting , Accepting input using Command line argument, Accepting input from console. **Object, Classes and Inheritance in Java:** Defining Your Own Classes, Access Specifiers (public, protected, private, default), Array of Objects , Constructor, Overloading Constructors and use of 'this' Keyword, static block, static Fields and methods, Object class methods, String Class, Inner class, Packages, Wrapper Classes , Garbage Collection, Memory allocation for objects, Constructor, Implementation of Inheritance, use of super keyword, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes, Use of final keyword related to method and class, abstract class and abstract methods, Defining and Implementing Interfaces, Object Cloning **Exception Handling, GUI components using AWT and Swing and Applets:** Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions, Assertions, Basics of AWT and Swing, their Difference, Layout Manager, Layouts, Components: JButton, JLabel, JText, JTextArea, JCheckBox and JRadioButton, JList, JComboBox, JMenu and JPopupMenu Class, JMenuItem and JCheckBoxMenuItem, JRadioButtonMenuItem, JScrollBar, Dialogs (Message, confirmation, input), JFileChooser, JColorChooser, Event Handling: Event sources, Listeners Mouse and Keyboard Event Handling, Adapters, Applet Life Cycle , appletviewer tool, Applet HTML Tags, Passing parameters to Applet , repaint() and update() method	NIL
B.Sc IIIrd Year (Sem VI)	Data Science using Python	3	**Introduction to Data Science:** Definition, Big Data and Data Science hype, Getting past the hype, Datafication, History and Current landscape of perspectives, Drew Conway's Venn diagram of data science, Roles and Skill sets of the Data Scientist in Data Science. **Statistical Inference:** Populations and samples of Big Data, Statistical Modeling, Probability Distributions, Fitting a Model. Introduction to Data Structures, Exploratory Data Analysis (EDA): The Data Science Process, Basic tools (plots, graphs and summary statistics) of EDA, Case Study: RealDirect (online real estate firm). **Introduction to Machine Learning:** Interpreting parameters, Confidence intervals, The role of explicit assumptions, Three basic Algorithms - Linear Regression: Fitting the model, Extending beyond least squares, Adding in modeling assumptions about the errors, Evaluation metrics(R-squared, p-values, Cross-validation), Transformations. k-Nearest Neighbors (k-NN): distance metrics(Cosine Similarity, Jaccard Distance, Mahalanobis Distance, Hamming Distance, Manhattan), Training and test sets, Choosing k, Binary Classes, Test Set in k-NN, modeling assumptions. k-means: Hierarchical modeling, 2D version, unsupervised learning. **Advances in Data Science:** Spam Filters, Naive Bayes, Bayes Law, Comparison between Naive Bayes to k-NN. Data Wrangling: APIs and other tools for scrapping the Web. Feature Selection (Extracting Meaning from Data), Feature Generation: (brainstorming, role of domain expertise and place for imagination), Feature Selection algorithms: (Filters, Wrappers, Decision Trees, Random Forests). **Recommendation Systems:** Problems with Nearest Neighbors, Sensitivity of distance metrics, The Dimensionality Problem, Singular Value Decomposition (SVD), Properties of SVD, Dimensionality Reduction, Singular Value Decomposition, Principal Component Analysis (PCA).	NIL

Mr. I. K. Mujawar
(Assistant Professor)

Dr. V. B. Waghmare
(Head of Dept)

Head
Dept. of Computer Science
Vivekanand College, Kolhapur

Teacher Name: Ms. R. Y. Patil

Class	Subject	Total Units	Completed Units	Remaining Units
B.Sc. IIIrd Year (Sem V)	Internet Technologies – I	3	**Introduction to Flask:** Flask as Micro Framework, Characteristics, Who uses Flask, Setup tools and pip (Installing Python, Installing Flask), working with virualenv (Creating new VE, Activating and Deactivating VE, Adding and Removing packages to-from VE), Introduction to IDE (PyCharm, PyDev), Application Structure (Initialization, Routes and View Functions, Server Startup, The Request-Response Cycle, Application and Request Contexts, Request Dispatching, Request Hooks, Responses, Command-Line Options with Flask-Script),First Simple Application **Jinja Templating:** The Jinja2 Template Engine, Rendering Templates, Comments, Variables, Control Structures, Filters, Templates with include and Inheritance, Twitter Bootstrap Integration with Flask-Bootstrap, Custom Error Pages, Links, Static Files **Creating and Rendering Forms:** Cross-Site Request Forgery (CSRF) Protection, Form Classes, HTML Rendering of Forms, Form Handling in View Functions, Redirects and User Sessions, Message Flashing, Validating Fields on the server side, Creating custom fields and validation.	**NIL**
B.Sc. IIIrd Year (Sem VI)	Internet Technologies – II	3	**Working with Databases:** SQL Databases, NoSQL Databases, SQL or NoSQL? Python Database Frameworks, Database Management with Flask-SQL Alchemy, Model Definition, Relationships, Database Operations ,Creating the Tables, Inserting Rows, Modifying Rows, Deleting Rows, Querying Rows, Database Use in View Functions, Integration with the Python Shell. **User Authentication:** Authentication Extensions for Flask ,Password Security ,Hashing Passwords with Werkzeug ,Creating an Authentication Blueprint, User Authentication with Flask-Login, Preparing the User Model for Logins, Protecting Routes, Adding a Login Form, Signing Users In, Signing Users Out, Understanding How Flask-Login Works, Testing Logins, New User Registration, Adding a User Registration Form, Registering New Users ,Account Confirmation , Generating Confirmation Tokens with itsdangerous, Sending Confirmation Emails, Account Management. **Application Deployment:** Deployment Workflow, Logging of Errors During Production, Cloud Deployment, The Heroku Platform, Preparing the Application, Testing with Heroku Local, Deploying with git push, Deploying an Upgrade, Docker Containers, Installing Docker, Building a Container Image, Running a Container.	**NIL**
B.Sc. Ist Year (Sem I)	Problem Solving using Computers (Python Programming)	3	**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, Structure of a Python Program(Python Shell Indentations, Comments), Python Interpreter, Writing	**NIL**

| B.Sc. IInd Year (Sem III) | Operating System | 3 | **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. S. Z. Mullani				
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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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 IIIʳᵈ 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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