Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Computer Science

Annual Teaching Plan

Academic Year: 2024-25

Semester: B.Sc. Sem-III,IV,V,VI
M.Sc. Sem-I,II,III,IV

Subject: Computer Science

Course Title: Computer Network & Advanced Computer Network, Operating System and Linux, Advanced Web Technology

Name of the teacher: Dr. V. B. Waghmare

	Month: July 2024			Module/Unit:	Sub-units planned
Course	Lectures	Practicals	Total		
B.Sc. III	7	16	23	**Unit-1 Introduction to Computer Network** 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.
B.Sc. II	7	16	23	**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
M.Sc.I	10		10	**Unit-1 Fundamentals of Research Methodology:**	Meaning, Objectives, Motivation and Types of Research, Research Approaches. Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is done? Criteria of Good Research, research process and steps involved Hypothesis: Meaning, function and types of hypotheses; Null/Alternative hypothesis, Literature survey, sources of information, review. Ethical issues and intellectual property rights. Publication process, selection of journals, citation index, impact factor, h-index, i10 index, Journal Cite Score, Google scholar index, Research gate, Academia, etc.
	Month: September 2023			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**		
B.Sc. III	10	16	26	**Unit-2 Data Communication** 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.
B.Sc. II	7	16	23	**Process Management** **Processes-** Process Concept,	Thread- Threads

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				Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems	
M.Sc.I	10		10	**Unit-2 Interpretation and Report Writing**	Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation. Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports. Mechanics of Writing a Research Report: Writing preliminaries, main body of research, references and bibliography. Precautions for Writing Research Reports. Meaning and importance of workshop, seminar, conference, symposium, etc. in research. Plagiarism- Concept and significance of plagiarism. Writing tools: Grammerly, Answerthepublic, Quillbot, Notion, Buzzsumo, Copyscape, Chatgpt, ginger. Referencing and citation tools: Endnote, Mendeley, Jabref, Zotero.
Month: October 2023				**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**		
B.Sc. III	12	16	28	**Unit-3 Introduction to Windows Server 2008** 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.	**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.
B.Sc. II	7	16	23	**CPU Scheduling-** Scheduling Criteria, Scheduling Algorithms	(First-Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling, Multilevel Queue Scheduling)
M.Sc.I	10		10	**Unit-3 Computer Applications & Unit-4 Research Methods in Computer Science**	Database Search engines, Softwares for Computer Science Research Areas, Emerging Technologies and Future Directions, Research Design, Data Collection: Quantitative and qualitative data, Data Analysis, Statistical analysis in computer science research, Qualitative data analysis methods, Data visualization techniques.
Month: November 2023				**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**		
B.Sc. III				**Semester Examination**	

B.Sc. II	7	16	23		
	Month: December 2023			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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
B.Sc. III	10	4	14		
B.Sc. II				**Semester Examination**	
M.Sc. II				Research Seminar	Research Seminar
	Month: January 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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.
B.Sc. III	10	16	26		
B.Sc. II	7	16	23	**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
M.Sc. II				Research Seminar	Research Seminar
	Month: February 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Unit-4 Managing Group Policy** Managing Group: Understanding group, By default Group, Creating Group, Adding Member To Group, Delete Group, Modifying Group.	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.
B.Sc. III	10	16	26		
B.Sc. II	7	16	23	**Storage Management**	File-System Interface-File Concept, Access Methods, Directory Structure, File-System Mounting, File Sharing, Protection,
M.Sc. II				Research Seminar	Research Seminar
	Month: March 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	Understanding Group Policy: Local & Active Directory Group Policy	Group Policy
B.Sc. III	10	16	26		
B.Sc. II	7	16	23	File-System Structure, File-System Implementation, Directory Implementation,	Efficiency and Performance, I/O Systems-I/O Hardware, Application I/O Interface, Kernel I/O Subsystem

				Allocation Methods, Free-Space Management,	
	Month: April 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Final Practical Examination**	
B.Sc. III					
B.Sc. II	7	16	23	**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.
	Month: May 2024			**Module/Unit:**	**Sub-units planned**
M.Sc.II	**Lectures**	**Practicals**	**Total**	**Final Examination**	

Dr. V. B. Waghmare

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Annual Teaching Plan

Academic Year: 2024-25 **Semester:** B.Sc. Sem-I,II,V,VI

Subject: Computer Science **Course Title:** Internet Technology-I
Internet Technology-II
Problem Solving using Computers
(Python Programming)

Name of the teacher: Dr. R. Y. Patil

	Month: July 2024			Module/Unit:	Sub-units planned
Course	Lectures	Practicals	Total	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
B.Sc. III	7	16	23		
B.Sc. I	7	16	23	**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.
M.Sc. I	10		10	**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
	Month: August 2024			**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total	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
B.Sc. III	10	16	26		
B.Sc. I	7	16	23	**UNIT-II-Building Blocks of Program:** Python	Data, Data Types, Data Binding, Variables, Constants, Declaration, Operations on Data such as assignment, arithmetic, relational,

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				Interpreter, Writing and executing simple program, Basic Data Types:	logical or boolean, ternary, bitwise, increment or decrement operators. Introduction to Python Programming: Features, Structure of a Python Program(Python Shell
M.Sc. I	10		10	**UNIT-II-Building Blocks of Program:** Python Interpreter, Writing and executing simple program, Basic Data Types:	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
	Month: September 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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
B.Sc. III	12	16	28		
B.Sc. I	7	16	23	**UNIT-III-Conditional Statements:**	break, continue, pass 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
M.Sc. I	10		10	**UNIT-III- Logics:**	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()
	Month: October 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**		
B.Sc. III				**Semester Examination**	
M.Sc. I				**Final Practical Examination**	
B.Sc. I	7	16	23	**Numeric Functions: Manipulation:**	abs(), ceil(), floor(), max(), min(), pow(), sqrt() String 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()
	Month: November 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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.
B.Sc. III	10	4	14		
B.Sc. I				**Semester Examination**	
	Month: December 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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 its dangerous, Sending Confirmation Emails, Account Management.
B.Sc. III	10	16	26		
B.Sc. I	7	16	23	**Unit -1 Python File Input-Output: Exception Handling Regular Expressions**	Opening and closing file, Various types of file modes, reading and writing to files, manipulating directories– What is exception, Various keywords to handle exception such try, catch, except, else, finally, raise – Concept of regular expression, various types of regular expressions, using match function
	Month: January 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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.
B.Sc. III	10	16	26		
B.Sc. I	7	16	23	**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

	Month: February 2025			Module/Unit:	Sub-units planned
Course	Lectures	Practicals	Total	Final Practical Examination	
B.Sc. III					
B.Sc. I	7	16	23	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
	Month: March 2025			Module/Unit:	Sub-units planned
Course	Lectures	Practicals	Total	Final Practical Examination	
B.Sc. I	7	16	23		
	Month: April 2025			Module/Unit:	Sub-units planned
	Lectures	Practicals	Total	Final Examination	
B.Sc. I					

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Academic Year: 2024-25 **Semester:** B.Sc. Sem-I,II,V,VI

Subject: Computer Science **Course Title:** Introduction to JAVA
Data Science using Python
Database Management System I & II

Name of the teacher: Dr. I. K. Mujawar

Month: July 2024				Module/Unit:	Sub-units planned
Course	Lectures	Practicals	Total		
B.Sc. III	7	16	23	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.
B.Sc. I	7	16	23	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)
Month: August 2024				**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total		
B.Sc. III	10	16	26	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
B.Sc. I	7	16	23	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)
M.Sc. I	10			Advanced DBMS Concepts:	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,

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					Record Based Logical Model (relational, hierarchical, network)
	Month: September 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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
B.Sc. III	12	16	28		
B.Sc. I	7	16	23	**MySQL -** DDL Statements DML 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 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.
M.Sc. I	10			**ER 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)
	Month: October 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Semester Examination**	
B.Sc. III					
B.Sc. I	7	16	23	**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)

M.Sc. I	10			Advanced Database Techniques	- 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 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.
	Month: November 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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.
B.Sc. III	10	4	14		
B.Sc. I				**Semester Examination**	
M.Sc. I				**Practical Examination**	
	Month: December 2024			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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).
B.Sc. III	10	16	26		
B.Sc. I	7	16	23	**Relational data model– ER to The Relational Model**	Domains, attributes, Tuples and Relations, Relational Model Notation, Characteristics of Relations, Relational Constraints - primary key, referential integrity, unique constraint, Null constraint, Check constraint Entity to Table, Relationship to tables with and without key constraints
	Month: January 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**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.
B.Sc. III	10	16	26		
B.Sc. I	7	16	23	**Introduction to Functional Dependencies and Normalization – Relational Algebra**	1NF, 2NF, 3NF operations (selection, projection, set operations union, intersection, difference, cross product Joins –conditional, equi join and natural joins, division)
	Month: February 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Advances in Data Science:**	Spam Filters, Naive Bayes, Bayes Law, Comparison between Naive Bayes to k-NN. Data Wrangling: APIs and other tools for
B.Sc. III	10	16	26		

				Recommendation Systems:	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). 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).
B.Sc. I	7	16	23	**MySQL Joining Tables – Subqueries –**	inner join, outer join (left outer, right outer, full outer) sub queries with IN, EXISTS, sub queries restrictions, Nested sub queries, ANY/ALL clause, correlated sub queries
	Month: March 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Final Practical Examination**	
B.Sc. III	10	16	26		
B.Sc. I	7	16	23	**Database Protection: MySQL –**	Security Issues, Threats to Databases, Security Mechanisms, Role of DBA, Discretionary Access Control Stored functions, procedures, cursor, trigger, views (creating, altering dropping, renaming and manipulating views)
B.Sc. I				**Final Practical Examination**	
	Month: April 2025			**Module/Unit:**	**Sub-units planned**
	Lectures	**Practicals**	**Total**	**Final Examination**	
B.Sc. III					
	Month: May 2025			**Module/Unit:**	**Sub-units planned**
	Lectures	**Practicals**	**Total**	**Final Examination**	
B.Sc. I					
M.Sc. I				**Final Examination**	

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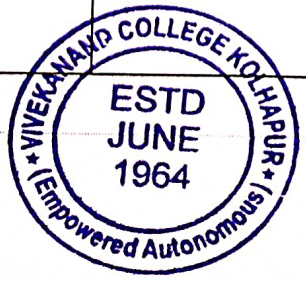
Academic Year: 2024-25 **Semester:** B.Sc. Sem-V,VI

Subject: Computer Science **Course Title:** Software Engineering
Object Oriented Software Engineering

Name of the teacher: Ms. M. P. Dinde

	Month: July 2024			Module/Unit:	Sub-units planned
Course	Lectures	Practicals	Total	Introduction to System Analysis	Definition of system, elements and characteristics of system, Types of system
B.Sc. III	7	16	23		
	Month: August 2024			**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total	Software Engineering Concepts	Requirement analysis, System Design, Object Design, Participants and roles: System analyst, Characteristics of software, System Development Life Cycle (SDLC), Classical model, Water fall model, Feasibility study, Fact finding technique. **Software Project Management:** Definition, Modelling, Problem Solving, Knowledge acquisition, Rationale Driven. Estimation in Project Planning Process, Project Scheduling.
B.Sc. III	10	16	26		
	Month: September 2024			**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total	Risk Management & Software Testing	Quality Management: Quality Concepts, Software Qualities, Software Quality Assurance, Software Reviews, Metrics for Process and Projects. Software Risks, Risk Identification, Risk Projection and Risk Refinement. White Box Testing, Black Box Testing, Alpha Testing, Beta Testing, Change Over. Case studies: College Admission system, Library system, Bank management System.
B.Sc. III	12	16	28		
	Month: October 2024			**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total	Semester Examination	
B.Sc. III					
	Month: November 2024			**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total	Introduction to OOAD & Introduction to UML	Object Oriented Concepts and Modelling: Introduction to class, Object, inheritance, polymorphism, Aggregation and Composition. Overview, Conceptual Model of UML, UML architecture.
B.Sc. III	10	4	14		
	Month: December 2024			**Module/Unit:**	**Sub-units planned**
Course	Lectures	Practicals	Total	UML Diagrams:	Unified Process Model Views, UML Diagrams: Class diagrams, Object diagrams, Statechart diagram. Static Modelling Notation: Package Diagrams, Composite Structures, Component Diagrams, Deployment Diagrams
B.Sc. III	10	16	26		



					Dynamic Modelling Notation: Use Case Diagrams, Activity Diagrams, Interaction Diagrams
	Month: January 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Mapping Object Model to Database Schema:**	Object Oriented Design: System Design process, Partitioning the analysis model, Concurrency and subsystem allocation, Task, Data and Resource management. Object Oriented Analysis: Iterative Development, Unified process & UP Phases: Inception, Elaboration, Construction and Transition.
B.Sc. III	10	16	26		
	Month: February 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Object Oriented Testing:**	Types of Testing, Object oriented Testing strategies, Test case design for OO software
B.Sc. III	10	16	26		
	Month: March 2025			**Module/Unit:**	**Sub-units planned**
Course	**Lectures**	**Practicals**	**Total**	**Final Practical Examination**	
B.Sc. III	10	16	26		
	Month: April 2025			**Module/Unit:**	**Sub-units planned**
	Lectures	**Practicals**	**Total**	**Final Practical Examination**	
B.Sc. III					
	Month: May 2025			**Module/Unit:**	**Sub-units planned**
	Lectures	**Practicals**	**Total**		

Ms. M. P. Dinde

Dr. V. B. Waghmare
Head of Department

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Computer Science

Annual Teaching Plan

Academic Year: 2024-25 **Semester:** B.Sc. Sem-III & IV

Subject: Computer Science **Course Title:** OOP and Data Structure using Python

Name of the teacher: Miss. S. V. Aundhakar

Month: July 2024			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**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.
7	4	11		
Month: August 2024			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**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.
10	4	14		
Month: September 2024			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**Unit-3 Inheritance and Polymorphism**	Inheritance in Python (Syntax, Advantages,)Access Modifiers in Python, Types of Inheritance (single, multiple, multilevel, hierarchical and hybrid)
13	4	17		
Month: October 2024			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**Polymorphism-Method.**	Overriding, magic methods and Operator Overloading
10	4	14		
Month: November 2024			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**Semester Examination**	
Month: December 2024			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**Unit-1 Abstract Data Type Introduction:** Abstractions, Abstract Data Types, Data Structures, General Definitions; **Application:** Student Records, Designing a Solution, Implementation	**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;
7	4	11		
Month: January 2025			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**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,
8	4	12		

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				The sorted linked list; **The Sparse Matrix Revisited** : An array of Lined list implementation, Comparing the Implementations;
Month: February 2025			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**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
4	4	8		
Month: March 2025			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**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
4	4	8		
Month: April 2025			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**Final Practical Examination**	
Month: May 2025			**Module/Unit:**	**Sub-units planned**
Lectures	**Practicals**	**Total**	**Final Examination**	

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