16. List all employees with salary > 60,000 AND located in "New York".
17. Display employees in descending order of salary.
18. Count the number of employees in each department.
19. Show the average salary of employees department-wise.
20. Display departments where the average salary is greater than 70,000.
21. Find the number of employees in each project.
22. Display departments with more than 3 employees.
23. Show the sum of all salaries department-wise.
24. List all distinct department IDs from the Employees table.
25. Show employee names with the year they were hired.
26. Show employees grouped by the year of hire.
27. List employees hired in the last 90 days.
28. List the no of years of experience of all the employees

Section D: Joins

29. List all employees with their department names (INNER JOIN).
30. Display all departments along with employees, including those departments without employees (LEFT JOIN).
31. Show employees and the projects they are working on (JOIN 3 tables: Employees, Employee_Project, Projects).
32. List projects along with total hours allocated by employees.
33. Write a query to find employees who are working on more than one project.
34. Show all projects handled by the 'Finance' department.

Section E: PL/SQL Programming

1. Write a procedure GetEmpInfo that takes emp_id as input and displays name, salary, and department.
2. Write a PL/SQL block that checks if an employee's salary is above 50,000. If yes, print "High Salary" ;Otherwise print "Standard Salary".
3. Write a PL/SQL program to display the top 10 rows in the Emp table based on their job and salary
4. Write a stored procedure GiveBonus that takes department ID and a designation as input, along with a bonus amount, and updates the salary of all employees in that department who have the specified designation by adding the bonus amount to their current salary.
5. Create a trigger to prevent inserting employees with a salary less than 30,000.
6. Create a trigger to avoid any transactions(insert, update, delete) on EMP table on Saturday & Sunday.

Note : The list of experiments is not limited to those mentioned above. A comprehensive set of programming or software tool-based exercises may be developed by the respective faculty members.

SEMESTER-IV

COURSE 8: ADVANCED ACCOUNTING

Theory **Credits: 4** **4 hrs/week**

Course Objectives

This course is designed to enable students to achieve the following objectives:

- Understand the basic principles and procedures of single entry system of accounting
- Deal with branch accounting

- Identify and analyse banking company accounts.
- Record and prepare final accounts for insurance companies in accordance with IRDA regulations;
- Examine the various accounts of non-profit organizations..

Course Outcomes:
Upon successful completion of this course, students will be able to:
CO1: Reconstruct financial statements from incomplete records using logical accounting procedures.
CO2: Prepare branch accounts using cost price, invoice price, and debtor system methods.
CO3: Prepare banking company accounts with schedules as per regulatory norms.
CO4: Prepare revenue accounts and balance sheets for life and general insurance companies.
CO5: Prepare accurate financial statements for non-profit organizations and interpret financial performance and position.

SYLLABUS

Unit-I: Accounting for Incomplete Records
Incomplete Records – Features – Differences between Single Entry and Double Entry – Limitations – Ascertainment of Profit using Statement of Affairs Method (Including Problems)

Unit-II: Accounting for Non-Profit Organisations
Non-Profit Organisations – Features – Provisions of Section 8 of Companies Act 2013- Books Maintained – Receipts and Payments Account – Income and Expenditure Account – Balance Sheet – Special Items: Subscription, Donations, Legacies, Entrance Fees – Capital and Revenue Items – Accounting Principles (including Problems).

UNIT-III: Branch Accounting
Branches – Types of Branches – Dependent Branches – Debtors System – Stock and Debtors System – Branch Accounts at Cost Price and Invoice Price – Independent Branches (including Problems).

Unit-IV: Accounting for Banking Companies
Banking Companies – Legal Framework – Banking Regulation Act, 1949 – Final Accounts of Banking Companies – Profit and Loss Account – Balance Sheet with Schedules (including Problems).

Unit-V: Insurance Company Accounts
Insurance Companies – Life and General Insurance – IRDA Guidelines – Preparation of Revenue Account, Profit & Loss Account and Balance Sheet of Life Insurance Companies (including Problems).

Activities

- Prepare reconstructed final accounts from incomplete records using a given data set.
- Solve problems on dependent and independent branch accounting using ledger accounts and adjustment entries.

- Draft financial statements for a simulated banking company using RBI-prescribed format.
- Analyze the annual reports of real insurance companies and identify accounting components.
- Visit a local NGO and collect data to prepare a sample Receipts & Payments Account and Income & Expenditure Account.

References:

1. Gupta, C. B. (2014). *Business organisation*. Mayur Publication.
2. Singh, B. P., & Chhabra, T. N. (2014). *An introduction to business organisation & management*. Kitab Mahal.
3. Sherlekar, S. A., & Sherlekar, V. S. (2000). *Modern business organization & management: Systems approach*. Himalaya Publishing House.
4. Bhushan, Y. K. (2003). *Business organization*. Sultan Chand & Sons.
5. Prakash, J. (2011). *Business organisation and management* (Hindi and English ed.). Kitab Mahal Publishers.

SEMESTER-IV

COURSE 9: COST AND MANAGEMENT ACCOUNTING

Theory **Credits: 4** **4 hrs/week**

Course Objectives:
This course is designed to enable students to :

- Introduce the principles, objectives, and methods of Cost Accounting and preparation of cost sheets.
- Impart knowledge on material cost control techniques and pricing methods of material issues.
- Familiarize students with labour cost computation and overhead allocation techniques.
- Develop analytical skills for interpreting financial statements using various analytical tools.
- Enable students to compute and interpret financial ratios for assessing business performance.

Course Outcomes:
Upon successful completion of this course, students will be able to:

CO1: Understand and differentiate Cost, Financial, and Management Accounting concepts, and prepare a cost sheet using appropriate classifications.
CO2: Apply inventory control techniques and material pricing methods to manage and account for material costs.
CO3: Compute labour costs using various incentive wage plans and distinguish between direct and indirect labour.
CO4: Analyze and interpret financial statements using comparative, common-size, and trend analysis techniques.
CO5: Evaluate business performance through various financial ratios including liquidity, solvency, profitability, and activity ratios.

SYLLABUS

UNIT - I: INTRODUCTION:

Cost Accounting: Definition – Features – Objectives – Functions – Scope – Advantages and Limitations - Essentials of a good cost accounting system- Management Accounting: Features – Objectives-functions-Management Accountant's role–Difference between Cost Accounting, Financial Accounting and Management Accounting– Cost concepts – Cost Classification - Preparation of Cost Sheet. (Including problems)

UNIT-II: MATERIAL:

Direct and Indirect Material cost – Inventory Control Techniques – Stock Levels – EOQ – ABC Analysis – JIT - VED - FSND - Issue of Materials to Production – Pricing methods: FIFO - LIFO with Base Stock and Simple and Weighted Average methods. (including problems)

UNIT-III: LABOUR

Labour: Direct and Indirect Labour Cost – Methods of Payment of Wages (only Incentive Plans): Halsey, Rowan, Taylor Piece Rate and Merrick Multiple Piece Rate Methods. (including problems)

UNIT-IV: FINANCIAL STATEMENT ANALYSIS AND INTERPRETATION

Financial Statements - Features, Limitations. Need, Meaning, Objectives, and Process of Financial Statement Analysis- Comparative Analysis – Common Size Statement and Trend Analysis (including problems)

UNIT -V: RATIO ANALYSIS

Meaning - Advantages and Limitation of Ratio Analysis – Types of Ratios –Liquidity Ratios- Solvency Ratios- Profitability Ratios- Activity Ratios (including problems)

Activities:

- Listing of industries located in your area and methods of costing adopted by them
- Collectionoffinancialstatementsofanytwoorganizationfortwoyearsandpreparea common Size Statements
- Collection of cost sheet and pro-forma of quotation
- Invited Lectures and presentations on related topics.
- Examinations (Scheduled and surprise tests)

Reference Books:

1. S.P.Jain and K.L.Narang–Advanced Cost Accounting, Kalyani Publishers.
2. M.N.Arora–A test book of Cost Accounting, Vikas Publishing House Pvt. Ltd.
3. S.N.Maheswari–Principles of Management Accounting, Sultan Chand &Sons.
4. Sharma &Shashi Gupta–Management Accounting, Kalyani Publishers.
5. S.P.Gupta–Management Accounting, S. Chand Publishing, NewDelhi.

SEMESTER-IV

COURSE 10: DATA SCIENCE USING PYTHON

Theory **Credits: 3** **3 hrs/week**

Course Objectives:

1. To introduce students to the foundational concepts and significance of data science in modern business and technology contexts.
2. To develop proficiency in Python programming, focusing on data types, control structures, and core operations.
3. To equip students with skills in handling and manipulating structured and unstructured data using Python libraries.
4. To enable students to perform exploratory data analysis and data cleaning using tools like NumPy and Pandas.
5. To foster the ability to visualize data effectively using Python libraries such as Matplotlib and Seaborn.

Course Outcomes:

1. Understand the role of data science, its components, and its relationship with AI and machine learning.
2. Apply Python programming constructs such as strings, lists, tuples, sets, and dictionaries to solve basic data problems.
3. Demonstrate the ability to perform data manipulation and cleaning using NumPy and Pandas.
4. Conduct exploratory data analysis and extract insights from datasets using Python-based tools.
5. Create and customize data visualizations using Matplotlib and Seaborn to communicate analytical findings.

Unit-I: Introduction to Data Science

Importance of Data Science: Need for Data Science, What is Data Science?, Data Science process, Business Intelligence and Data Science, Components of Data Science, Relationship between Artificial Intelligence, Machine Learning and Data Science.

Categories of Data: Unstructured data, Structured data, Semi Structured data, Time series data, Sources of data: APIs, Web pages, Databases, Files, Taxonomy of types of data.

Data Scientist: Responsibilities of a data scientist, Skills required for a data scientist, Programming and Analysis tools for Data Science.

Case Study: Mapping Data Categories to Banking Operations.

Unit-II: Basic Python: Part-I

Features of Python, writing and executing python program, Indentation, Constants, Identifiers, Variables, Keywords, Data types,Input/Output, Operators. Conditional statements, Looping Statements.

Strings: Definition, Positive, Negative indexing, String slicing, String Operations: Concatenation,
Repetition, Membership(in, not in),Comparison, String Methods: upper( ), lower( ), strip( ), replace( ), split( ), join( ), find( ).

Lists: Definition, Indexing, Slicing, Negative Indexing, Nested Lists, Modifying Lists: Updating, Inserting, Deleting elements, List Functions: len( ), max( ), min( ), sorted( ), Looping through Lists.

Unit-III : Basic Python: Part-II

Tuples : Definition, Indexing, Slicing, Nested tuples, Tuple Operations: Concatenation, repetition, membership testing, Tuple Methods: count( ), index( ).
Sets: Definition, Accessing Set elements, Modifying Sets, Set Operations: Union, Intersection, difference, Symmetric Difference.
Dictionaries: Definition, Accessing elements, Modifying Dictionaries, Dictionary methods.
Functions: User defined functions, built-in functions, lambda functions, recursive functions.
Modules: math, random.

Unit-IV : Advance Python : Part-I

Exploratory Data Analysis: What is EDA, Steps involved in EDA, Python Libraries used in EDA.

Numpy: Basics, Array Attributes, Slicing (1D, 2D and 3D), Numpy Array Iteration, Operations on Arrays: Concatenating Arrays , Reshaping Arrays , Splitting Arrays , Statistical Operations on Arrays.

Pandas: Basics, Series, DataFrame, Comparison between Series and DataFrame. Reading data from varied data sources into python DataFrame: Read from Excel Data Source, Read data from .csv file, Read data from Dictionaries.

Data Cleaning : Handling missing values, Removing duplicates, Correcting Inconsistencies.

Dataset Repositories for Data Science & Visualization : Kaggle Datasets, UCI ML repository.

Case Study: Retail Sales Analysis using Kaggle Dataset.

Unit-V : Advance Python : Part-II

Data visualization : Introduction to Data Visualization, Benefits of Data Visualization, Popular Python Data Visualization Libraries.

Matplotlib : Introduction, Basic Plots: Line plot, Bar chart, pie chart, Histogram, Scatter plot, Plot Customization: Titles, labels, and legends,Gridlines and ticks, Colors, markers, and line styles, Subplots and Layouts.

Seaborn : Introduction, Comparison with matplotlib, Generating Plots: Heatmaps, Boxplots.

Case Study: Visualizing Financial data.

Text Books:

1. Kooper, Steven. *Data Science from Scratch*. 2nd Edition. O'Reilly Media, 2019.
2. Vasiliev, Yuli. *Python for Data Science: A Hands-On Introduction*. No Starch Press, 2022.
3. Acharya, Seema. *Reimagining Data Visualization Using Python*. Chapman & Hall/CRC, 2022.

4. VanderPlas, Jake. *Python Data Science Handbook: Essential Tools for Working with Data*. 2nd Edition. O'Reilly Media, 2022.

Reference Books:

1. *Data Science and Analytics with Python*. Chapman & Hall/CRC Data Mining and Knowledge Discovery Series, 2017.
2. Nelson, Daniel. Data Visualization in Python. StackAbuse, 2020. *Available via StackAbuse.*
3. McKinney, Wes. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython. 2nd Edition. O'Reilly Media, 2017.

Online Resources:

1. https://www.coursera.org/learn/python-data-science
2. https://www.mltut.com/best-free-resources-to-learn-python-for-data-science/
3. https://onlinecourses.swayam2.ac.in/

Activities

1. Understanding Data Science, AI, and Machine Learning

Activity:

Conduct a group-based concept mapping session. Students collaborate to create a visual diagram showing connections among data science, AI, and machine learning. Each component (e.g., data analysis, modeling, tools like Python) is linked with explanations.

Evaluation Method:

Assess the concept maps on a 10-point scale based on Completeness of topics (20%), Accuracy of relationships (40%), Clarity and organization (20%) and Group discussion and presentation (20%)

2. Applying Python Programming Constructs

Activity:

Give students a mini coding challenge: write a Python script to count word frequency in a paragraph using strings, lists, dictionaries, and sets.

Evaluation Method:

Evaluate on 1 10-point scale on the basis of: Correct use of each construct (40%), Code readability and comments (20%), Output accuracy (30%) and Bonus for optimized solutions (10%)

3. Data Manipulation and Cleaning Using NumPy & Pandas

Activity:

Provide a messy dataset (e.g., with missing values, duplicates, incorrect formats). Ask students to clean and transform the data using NumPy and Pandas.

Evaluation Method:

Rubric includes: Identification of cleaning tasks (25%), Implementation correctness (40%), Use of appropriate functions and methods (20%), Final cleaned dataset quality (15%)

4. Exploratory Data Analysis and Insight Extraction

Activity:

Students choose a public dataset and perform an EDA process to uncover key trends and outliers. They document their observations in a Jupyter Notebook.

Evaluation Method:

Evaluated on: Depth of analysis (30%), Use of statistical summaries and visualizations (40%), Insightful interpretations (20%) and Notebook presentation quality (10%)

5. Creating Visualizations Using Matplotlib and Seaborn

Activity:
Assign a storytelling task: create a data dashboard using Matplotlib and Seaborn that explains a specific trend (e.g., COVID-19 cases, sales over time).
Evaluation Method:
Evaluate on 1 10-point scale on the basis of: Correct use of chart types (25%), Visual appeal and clarity (25%), Annotation and labelling (20%), Connection to the narrative (30%)

SEMESTER-IV

COURSE 10: DATA SCIENCE USING PYTHON

Practical	**Credits: 1**	**2 hrs/week**

List of Experiments:

1. Write a Python program to demonstrate basic data types in python.
2. Write a Python program to illustrate arithmetic operators.
3. Write a Python program to find the maximum of three numbers.
3. Write a Python Program to find the sum of digits of a number.
4. Write a Python Program to check whether a given number is palindrome or not.
5. Write a Python program to check whether a given number is prime or not.
6. Write a Python program to calculate Simple Interest and Compound Interest.
6. Write a Python program to illustrate Strings and String methods.
7. Write a Python program to illustrate string slicing.
8. Create a list and perform the following methods.
   a) append() b) extend() c) insert() d) pop() e) remove() f) clear
9. Create a list and perform the following functions.
   a) len( ) b) max( ) c) min( ) d) sorted( )
10. Write a program to input n numbers from the user. Store these numbers in a tuple. Print the maximum and minimum number from this tuple.
11. Create a dictionary and apply the following methods.
    a) Print the dictionary items b) Access items c) Use get( ) d) Use get( ) e) Use len( )
12. Write a Python program to find the factorial of a number using functions.
13. Write a Python program to find the factorial of a number using recursion.
14. Write a Python program to find the maximum of two numbers using lambda function.
15. Write a Python program to illustrate a *math* module.
16. Write a Python program to illustrate a *random* module.
17. Write a Python program to illustrate numpy array attributes: ndim, shape, size, dtype.
18. Write a Python program to illustrate numpy array statistical operations.
19. Write a python program to demonstrate Reading data from varied data sources into Pandas DataFrame.
    a) Read Data from Excel Data Source and display.
    b) Read Data from "iris.csv" into pandas DataFrame and display. [source: UCI ML repository]
    c) Load a Python Dictionary into a DataFrame.
20. Consider any Dirty Dataset for Data Cleaning [Source: Kaggle Dataset Repository] And perform the following.
    a) Remove Rows that contain empty cells.
    b) Clean Wrong Format.
    c) Clean Wrong Data.
    d) Remove Duplicates.
21. By using matplotlib generate Bar chart for revenue by product category.
22. By using matplotlib generate Pie chart for market share distribution of companies.
23. By using matplotlib generate Histogram for customer age distribution.
24. By using seaborn generate correlation Heatmap.
25. By using seaborn illustrate Boxplot.