



**ANDHRAPRADESH STATE COUNCIL OF HIGHER
EDUCATION**

**Model Syllabus for 4-Year UG Honours in B.Com. (Computer Applications) as
Major in consonance with Curriculum framework w.e.f. AY 2025-26**

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits	
I	I	1	Business Organization and Management	4	4	
		2	Fundamentals of Information Technology & Office Automation	3	3	
			Fundamentals of Information Technology & Office Automation- Practical	2	1	
	II	3	Financial Accounting I	4	4	
		4	E-Commerce and Web Application and Development	3	3	
			E-Commerce and Web Application and Development - Practical	2	1	
II	III	5	Financial Accounting II	4	4	
		6	Business Statistics	4	4	
		7	Database Management System	3	3	
			Database Management System- Practical	2	1	
	IV	8	Advanced Accounting	4	4	
		9	Cost and Management Accounting	4	4	
		10	Data Science using Python	3	3	
			Data Science using Python- Practical	2	1	
III	V	11	Corporate Accounting	4	4	
		12 A	Entrepreneurship & Start-Ups	4	4	
		OR				
		12 B	Business Intelligence tools and Data Visualisation	3	3	

G. Lakshmi

- Sections: Home, About, Projects, Contact
- Responsive layout
- Bootstrap components (navbar, carousel, buttons)

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-III

COURSE 5: FINANCIAL ACCOUNTING II

Theory

Credits: 4

4hrs/week

Course Objectives:

This course is designed to:

- Understand consignment accounts.
- Evaluate different methods of joint ventures accounting.
- Familiarise with the preparation of accounts in non-profit organizations.
- Acquaint with preparation of partnership deed and treatment of various accounts.

- Give practical insights on partnership accounts which; admission, retirement, death and dissolution.

Course Outcomes(COs):

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

CO1: Analyse the various accounts related to consignment business. **CO2:**

Prepare accounts of joint ventures under different methods.

CO3: Understand the preparation of receipts and payment, income and expenditure accounts;

CO4: To explore the essence of partnership deed and preparation of accounts in partnership;

CO5: Apply accounting procedures for partner's death, firm dissolution, and insolvency, including the Garner v. Murray Rule.

SYLLABUS

Unit I: Bills of Exchange

Meaning of Bill – Features of Bill – Parties in the Bill – Discounting of Bill – Renewal of Bill – Entries in the Books of Drawer and Drawee (Including Problems).

Unit-II: Consignment Accounts

Consignment - Features - Proforma Invoice - Account Sales – Del-credere Commission - Accounting Treatment in the Books of Consigner and Consignee - Valuation of Closing Stock - Normal and Abnormal Losses (including Problems).

Unit-III: Joint Venture Accounts

Joint Venture - Features - Difference between Joint-Venture and Consignment – Accounting Procedure – Methods of Keeping Records – One Vendor Keeps the Accounts and Separate Set off Books Methods (including Problems).

Unit IV: Partnership Accounts-I

Meaning – Partnership Deed - Fixed and Fluctuating Capitals Accounting Treatment of Goodwill – Admission, Retirement (including problems).

Unit V: Partnership Accounts-II:

Death of a Partner - Dissolution of a Partnership Firm – Application of Garner v/s Murray Rule in India – Insolvency of Partners (including problems)

Activities:

- Visit a local consignment agency to collect and analyze real samples of proforma invoices and account sales statements.
- Prepare a comparative chart highlighting key differences between consignment and joint venture transactions, roles, and accounting procedures.

- Draft Receipts & Payments Account and Income & Expenditure Account using simulated or real data from a non-profit organization.
- Conduct interviews or field interaction with office bearers of a local non-profit organization to understand their accounting practices and compliance with Sec 8.
- Group activity to draft a model partnership deed, including clauses on profit sharing, admission, retirement, and treatment of goodwill.

References:

1. Ranganatham, G., & Venkata Ramanaiah, M. (2019). *Financial accounting*. New Delhi: S. Chand Publications.
2. Gupta, R. L., & Gupta, V. K. (2022). *Principles and practice of accounting* (18th ed.). New Delhi: Sultan Chand & Sons.
3. Reddy, T.S., & Murthy, A. (2022). *Financial accounting* (Revised ed.). Chennai: Margham Publications.
4. Jain, S.P., & Narang, K.L. (2023). *Advanced accountancy – Vol. I* (Latest ed.). Ludhiana: Kalyani Publishers.
5. Maheshwari, S.N., & Maheshwari, S.K. (2021). *Introduction to accountancy* (12th ed.). New Delhi: Vikas Publishing House.

SEMESTER-III

COURSE 6: BUSINESS STATISTICS

Theory

Credits: 4

4hrs/week

Course Objectives:

This course is designed to:

- Understand and be able to collect and present data in the most refined and relevant manner pertaining to the research

- Enable student to understand, different measures of central tendency.
- Develop the ability to compute and interpret various measures of dispersion.
Compute skewness
- Establish the relationship between two variables by using measures of relations

Course Outcomes (COs)

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

CO1: Understand the basic concepts and significance of statistics, and present data using classification, tabulation, and graphical methods.

CO2: Compute and interpret various measures of central tendency to analyze data sets effectively.

CO3: Apply measures of dispersion to evaluate variability and consistency in data.

CO4: Analyze data distribution using skewness measures and interpret asymmetry in data sets.

CO5: Evaluate relationships between variables using correlation techniques like Pearson's and Spearman's methods.

SYLLABUS

Unit I: Introduction to Statistics

Definition, Importance, Characteristics, and Limitations of Statistics – Classification and Tabulation of Data – Construction of Frequency Distribution Tables – Diagrammatic and Graphical Representation of Data (Bar Diagrams, Pie Charts, Histogram, Frequency Polygon, Ogive curves) – (Including problems)

Unit II: Measures of Central Tendency

Types of Averages – Characteristics of an Ideal Average – Computation and Application of Mean, Median, Mode – Median-based Averages – Geometric Mean – Harmonic Mean – (Including problems)

Unit III: Measures of Dispersion

Concept and Properties of Dispersion – Absolute vs. Relative Measures – Types: Range, Quartile Deviation (Semi-Interquartile Range), Mean Deviation, Standard Deviation – Coefficient of Variation (Including problems)

Unit IV: Skewness

Meaning and Importance of Skewness – Absolute and Relative Measures – Karl Pearson's, Bowley's, and Kelly's Coefficients of Skewness (Including problems)

Unit V: Measures of Relation

Correlation: Concept, Need, and Uses – Types of Correlation – Karl Pearson's Correlation Coefficient – Interpretation using Probable Error – Spearman's Rank Correlation – (Including problems)

Activities:

- Organize student-led seminars and quizzes on statistical concepts.
- Collect and interpret demographic and economic statistics of local areas (village/town/district).

- Participate in government-led statistical experiments (e.g., crop-cutting surveys).
- Practice statistical functions and data visualization using MS Excel.
- Prepare questionnaires and conduct sample surveys.

References:

1. Reddy, C.R. (1994). *Business statistics*. Deep & Deep Publications.
2. Gupta, S.P. (1992). *Statistical methods*. Sultan Chand & Sons.
3. Kapoor, V.K. (2018.). *Statistics: Problems and solutions*. Sultan Chand & Sons.
4. Elhance, D. N. (2017). *Fundamentals of statistics*. [Sultan Chand & Sons].
5. Vittal, P.R. (2018). *Business statistics*. Margham Publications.

SEMESTER-III

COURSE 7: DATABASE MANAGEMENT SYSTEM

Theory

Credits: 3

3hrs/week

Course Objectives:

1. Understand the fundamental concepts of data, databases, and the architecture of Database Management Systems (DBMS). Analyze and design database schemas using Entity-Relationship (E-R) and Extended E-R models.

2. Apply relational database principles, including normalization and integrity constraints, to ensure efficient schema design.
3. Develop SQL queries for data definition, manipulation, and control, including advanced operations like joins and nested queries.
4. Implement PL/SQL programming constructs and managed database transactions with a focus on ACID properties.

Course Outcomes:

The Learners will be able to:

1. Differentiate between file systems and DBMS, and explain the evolution, architecture, and components of modern database systems.
2. Design conceptual data models using E-R and Extended E-R diagrams, including specialization, generalization, and aggregation.
3. Normalize relational schemas up to BCNF and apply relational algebra operations to query and manipulate data.
4. Write efficient SQL queries using DDL, DML, DCL, and TCL commands, and utilize functions, joins, and views for data analysis.
5. Develop PL/SQL blocks with control structures, procedures, and triggers, and manage transactions ensuring atomicity, consistency, isolation, and durability.

Unit-I: Overview of Database Management System

Introduction: Data, Information, Database, Database Management System, Database System Applications, File Systems versus DBMS, Advantages of DBMS.

Evolution of Database Systems, Data Models, Data Abstraction, Database Architecture, Centralized and Client/Server Architectures for DBMSs, Database Users, Database Administrator, Components of DBMS, DBMS Vendors.

Unit-II: Database Design and the E-R Model

Overview of the Database Design Process, The Entity-Relationship Model : Entity Sets, Classification of Entity Sets, Attributes, Types of Attributes, Relationship, Relationship Set, Degree of a relationship set, Relationship Classification, Mapping cardinalities.

Extended Entity Relationship Model : Specialization, Generalization, Constraints, Attribute Inheritance and ISA relationship, Aggregation.

Case Study: Hospital Management System

Unit-III: Relational Database Design

Relational Model: Introduction to Relational Model, Concepts of Relation, Tuple, Attribute, Instance, Domain. Keys (Super key, Candidate Key, Primary Key, Foreign Key), Constraints (Domain constraints, Key constraints, Integrity constraints), selection, projection operations, Codd's rule set for relational databases.

Normalization: Purpose of Normalization/ Schema refinement, Functional dependencies, Normal Forms : 1NF, 2NF, 3NF and BCNF, Denormalization.

CaseStudy:CollegeStudentEnrollmentSystem

Unit-IV:IntroductiontoSQL

StructuredQueryLanguage(SQL):OverviewoftheSQL, Datatypes, Operators, Basic structure of SQL Query,

Commands:DataDefinitionLanguage(DDL),DataManipulationLanguage(DML),Data Control Language (DCL), Transaction ControlLanguage (TCL).

Functions:Numeric,String,DateFunctions.Setoperators,Aggregatefunctions,Nested queries, Joins, GROUP By Clause, ORDER By Clause, views.

CaseStudy:RetailStoreDatabaseManagement(Designandqueryarelationaldatabasefora retail store that manages products, customers, orders, and employees. Apply SQL concepts to extract insights, maintain data integrity, and support decision-making.)

Unit-VAdvancedSQLandTransaction Management

PL/SQL: Structure of PL/SQL block, Control Structures, Procedures, Functions, Exception handling, Cursors, Triggers.

Transactions : Transaction concept, Simple transaction model, State diagram of a transaction, ACID properties: Atomicity, Consistency, Isolation, Durability.

Textbooks:

1. Database System Concepts, Avi Silberschatz, Henry F. Korth,S. Sudarshan, Seventh Edition, McGraw-Hill
2. DatabaseManagementSystemsbyRaghuRamakrishnan, McGrawhill

ReferenceBooks:

1. FundamentalsofDatabaseSystems,ElmasriNavathePearsonEducation
2. AnIntroductiontoDatabasesystems,C.J.Date,A.Kannan,S.SwamiNadhan, Pearson

Activities:

Outcome: Describe the fundamentals of data, database systems, and the differences between file-based and database approaches. Compare and classify various DBMS architectures, data models, and their components, including the three-schema architecture.

Activity:Createacomparativepresentationorinfographicillustrating:

- File-basedvs.DBMSapproaches
- TypesofDBMSarchitectures(1-tier,2-tier,3-tier)
- Datamodelsandthethree-schemaarchitecture

Evaluation Method: Rubric-based assessment of the presentation covering clarity, accuracy, and depth of comparison. Include a short quiz to test conceptual understanding.

Outcome:DesignconceptualdatamodelsusingEntity-RelationshipandEnhancedER diagrams, applying generalization, specialization, and constraints.

Activity: Model a university or hospital database using ER and Enhanced ER diagrams thatshows:

- Entity sets, relationships
- Generalization/specialization
- Participationandcardinality constraints

Evaluation Method: Diagram submission with peer review and instructor feedback. Use a checklist to assess completeness, correctness, and notation usage.

Outcome: Apply relational model concepts, including CODD rules, relational algebra, relational calculus, and normalization techniques.

Activity: Normalize a given unstructured dataset up to 3NF. Then, write relational algebra expressions for sample queries.

Evaluation Method: Written assignment graded on:

- Correctness of normalization steps
- Accuracy of relational algebra expressions
- Short-answer questions on CODD rules and relational calculus

Outcome: Construct and execute SQL queries for data definition, manipulation, aggregation, joining, and subqueries, including views and set operations.

Activity: Implement a mini-project (e.g., Library or Inventory DB) using SQL. Include:

- Table creation (DDL)
- Data manipulation (DML)
- Aggregation, joins, subqueries, views, and set operations

Evaluation Method: Lab-based practical test with query execution and output validation. Include a viva to explain logic and optimization.

Outcome: Develop PL/SQL programs incorporating control structures, procedures and functions to manage database behaviour effectively.

Activity: Build a PL/SQL-based payroll or student grading system using:

- Procedures and functions
- Control structures (IF, LOOP)
- Triggers for automated updates

Evaluation Method: Code review and demonstration. Evaluate based on:

- Syntax correctness
- Logical flow

SEMESTER-III

COURSE 7: DATABASE MANAGEMENT SYSTEM

Practical

Credits:1

2 hrs/week

Experiment 1: Database: Inventory Management

Table 1: Products

Structure:

ColumnName	Data Type	Constraints
product_id	INT	PRIMARYKEY
product_name	VARCHAR(50)	NOT NULL
price	DECIMAL(10,2)	CHECK(price>0)
stock_qty	INT	CHECK(stock_qty>=0)

Sample Data:

product_id	product_name	price	stock_qty
1	Pen	10.00	100
2	Notebook	50.00	200
3	Stapler	120.00	50
4	Marker	25.00	80
5	FileFolder	60.00	150

Table2:Suppliers Structure:

ColumnName	Data Type	Constraints
supplier_id	INT	PRIMARYKEY
supplier_name	VARCHAR(50)	NOT NULL
contact_no	VARCHAR(20)	UNIQUE
product_id	INT	FOREIGN KEY REFERENCES Products(product_id)

Sample Data:

supplier_id	supplier_name	contact_no	product_id
101	StationeryMart	9876543210	1
102	PaperWorld	9876500000	2
103	OfficeSupplies	9876512345	3
104	MarkerHub	9876522222	4
105	FileDepot	9876533333	5

SectionA:DDL(DataDefinition Language)

1. CreateadatabasecalledInventoryDB.
2. CreateatableProducts andtableSupplierswiththespecifiedcolumnsand constraints:

SectionB:DML(Data ManipulationLanguage)

4. Insertatleast5rowsintotheProducts table.
5. Insertatleast5rowsintotheSuppliers table.
6. Updatethestockquantityofproduct'Pen'to 120.
7. Deleteasupplierwith aspecificsupplier_id.
8. Writequery torename 'Notebook'to'NoteBook A4'

Section C: DQL (SELECT Queries)

9. Display all records from the Product table.
10. Display only product_name and price of all products.
11. List all products that have a stock quantity less than 100.
12. Show all products between 20 and 100 price range.
13. Find all suppliers whose contact number starts with '98765'.
14. Find the average price of products.
15. Display the total number of products in the inventory.
16. Show the maximum and minimum stock quantities.
17. Count how many suppliers supply each product.
18. Show all products where price > 50 AND stock_qty > 100.
19. Show all products where price < 20 OR stock_qty < 80.
20. Display suppliers whose supplier_name contains the word 'Mart'.
21. List all suppliers along with the product they supply (use INNER JOIN).
22. Display suppliers whose name starts with 'S'.
23. Find products whose name has exactly 5 characters.
24. Find suppliers whose supply products costing more than 100.

Experiment 2: ONLINE BOOK STORE DB

An online bookstore wants to implement a BOOK STORE DB for managing their online transactions by using the following tables.

Authors Table

ColumnName	Data Type	Constraints
author_id	INTEGER	PRIMARY KEY
first_name	VARCHAR	NOT NULL
last_name	VARCHAR	NOT NULL
nationality	VARCHAR	NULL allowed

Books Table

ColumnName	Data Type	Constraints
book_id	INTEGER	PRIMARY KEY
Title	VARCHAR	NOT NULL
author_id	INTEGER	FOREIGN KEY REFERENCES Authors
publication_year	INTEGER	
Price	DECIMAL	

Customers Table

ColumnName	Data Type	Constraints
customer_id	INTEGER	PRIMARY KEY
first_name	VARCHAR	NOT NULL
last_name	VARCHAR	NOT NULL

Email	VARCHAR	UNIQUE, NOT NULL
Address	VARCHAR	NOT NULL

OrdersTable

ColumnName	DataType	Constraints
order_id	INTEGER	PRIMARYKEY
customer_id	INTEGER	FOREIGNKEYREFERENCESCustomers
book_id	INTEGER	FOREIGNKEYREFERENCESBooks
order_date	DATE	NOT NULL
quantity	INTEGER	NOT NULL

SAMPLEDATASETforBOOKSTOREDB

Authors Table

author_id	first_name	last_name	nationality
1	Jane	Austen	British
2	George	Orwell	British
3	Gabriel	Garcia Marquez	Colombian
4	Toni	Morrison	American
5	Mark	Twain	American
6	Harper	Lee	American
7	Fyodor	Dostoevsky	Russian

BooksTable

book_id	Title	author_id	publication_year	price
101	Prideand Prejudice	1	1813	12.99
102	1984	2	1949	9.50
103	OneHundredYearsof Solitude	3	1967	15.00
104	Beloved	4	1987	11.25
105	AnimalFarm	2	1945	8.75
106	AdventuresofHuckleberryFinn	5	1884	10.50
107	ToKill a Mockingbird	6	1960	14.00

Customers Table

customer_id	first_name	last_name	Email	address
201	Alice	Smith	alice.s@example.com	12OakSt, London
202	Bob	Johnson	bob.j@example.com	45PineAve, Oxford
203	Charlie	Brown	charlie.b@example.com	78Maple Rd, Bristol

204	Diana	Prince	diana.p@example.com	34QueenSt, York
205	Edward	Norton	edward.n@example.com	22 RiverLn, Leeds
206	Fiona	Hall	fiona.h@example.com	56LakeDr, Bath
207	Greg	Miller	greg.m@example.com	89ParkAve, Glasgow

OrdersTable

order_id	customer_id	book_id	order_date	Quantity
301	201	101	2025-07-20	1
302	202	102	2025-07-21	2
303	201	105	2025-07-22	1
304	203	103	2025-07-23	1
305	204	106	2025-07-24	1
306	205	107	2025-07-25	3
307	206	104	2025-07-26	2

Section A: DDL (Schema Design & Constraints)

- Write SQL statements to create all 4 tables (Authors, Books, Customers, Orders) with:
 - Primary Keys
 - Foreign Keys
 - Appropriate datatypes
 - NOT NULL constraints where necessary.
- Alter the Books table to add a constraint that price must be greater than 0.
- Add a new column phone_number to the Customers table (VARCHAR(15)) and ensure it is unique.
- Drop the phone_number column from the Customers table.

Section B: DML (Data Manipulation)

- Insert at least 7 records for each table (use sample dataset above).
- Update the price of the book titled *Animal Farm* by increasing it by 10%.
- Delete all orders made before 2025-07-21.
- Change the nationality of Gabriel Garcia Marquez to "Latino-American".

Section C: SELECT Queries (Data Querying)

- List all books published between 1900 and 2000.
- Find all customers whose email contains "example.com".
- Retrieve books whose price is between 10 and 15 and published before 1950.
- Show authors who are either 'British' or 'American'.
- Find books that have a price less than 10 or are republished after 1980.
- Display all orders placed after 2025-07-22.
- List all books written by author with author_id=2.

16. Findcustomerswhoselastnamestartswith B.
17. ShowallbookswithapriceNOTbetween9and13.
18. Displaybookswhosepublication_yearisin(1813,1945,1987).
19. Findauthorswhose nationalityisNOT'British'.
20. Listcustomerswhoseaddress containsthewordPark.
21. Showallbookssortedbypriceindescendingorder.
22. Listauthorsinalphabeticalorderbylast_name.
23. Displayorderssortedbyorder_date(latestfirst).

Use of Date Functions

24. ShowallordersplacedinJuly2025.
25. Showallorderswith anestimateddeliverydate(5daysafterorderdate).
26. Showcustomerswhoplacedanorderonaweekend.
27. Calculatehowmanydayshavepassedincethelastorderwasplaced.

Aggregate Functions (COUNT, SUM, AVG, MIN, MAX)

28. Countthetotalnumberofbooksinthedatabase.
29. Findtheaveragepriceofall books.
30. Showthehighest-priced book.
31. Counthowmanyorderseachcustomerhas placed.
32. Calculatethetotalsales(price×quantity)foreachcustomer.

GROUP BY and HAVING

33. Counthowmanybooksarewrittenbyeachauthor.
34. Groupordersbycustomer_idanddisplaytotalquantity ordered.
35. Showcustomerswhohaveorderedmorethan 2booksintotal(useHAVING).
36. Findthetotalnumberofbookssoldperauthor(GROUPBYauthor).

Experiment 3: EMPLOYEE DB

An enterprise wants to automate its employee management process by implementing an Employee Database. The goal is to replace manual record-keeping with a centralized system that stores employee, department, and project details. Use the following table structures and data set to implement Employee DB.

EmployeeDB–TableStructures

1. DepartmentsTable

Column	Type	Constraints
dept_id	INT	PRIMARYKEY
dept_name	VARCHAR	UNIQUE,NOTNULL
location	VARCHAR	NOT NULL

2. EmployeesTable

Column	Type	Constraints
emp_id	INT	PRIMARYKEY
first_name	VARCHAR	NOT NULL
last_name	VARCHAR	NOT NULL
email	VARCHAR	UNIQUE,NOTNULL
phone	VARCHAR	CHECK(phoneLIKE'--____')
hire_date	DATE	NOT NULL
job_title	VARCHAR	NOT NULL

salary	DECIMAL	CHECK(salary>0)
dept_id	INT	FOREIGNKEYREFERENCESDepartments(dept_id)
manager_id	INT	FOREIGN KEY REFERENCES Employees(emp_id) (self-referential)

3. ProjectsTable

Column	Type	Constraints
project_id	INT	PRIMARYKEY
project_name	VARCHAR	NOT NULL
start_date	DATE	NOT NULL
end_date	DATE	NULL
dept_id	INT	FOREIGN KEY REFERENCES Departments(dept_id)

4. EmployeeProjectTable(Many-to-Many)

Column	Type	Constraints
emp_id	INT	FOREIGN KEY REFERENCES Employees(emp_id), PRIMARY KEY(emp_id, project_id)
project_id	INT	FOREIGNKEYREFERENCESProjects(project_id)
hoursallocated	INT	CHECK(hours_allocated>0)

Sample Data Set

DepartmentsTable

dept_id	dept_name	Location
1	HR	NewYork
2	IT	SanFrancisco
3	Finance	Chicago
4	Marketing	Boston
5	Operations	Seattle
6	Legal	WashingtonD.C.
7	Sales	Dallas
8	R&D	Austin
9	Procurement	Denver
10	CustomerCare	Miami

2. EmployeesTable

emp_id	first_name	last_name	Email	phone	hire_date	job_title	salary	dept_id	manager_id
101	Alice	Johnson	alice.j@corp.com	123-456-7890	2020-03-15	HR Manager	75000	1	NULL
102	Bob	Smith	bob.s@corp.com	234-567-8901	2019-05-20	IT Analyst	65000	2	104
103	Charlie	Brown	charlie.b@corp.com	345-678-9012	2021-01-10	Finance Executive	58000	3	106
104	Diana	Prince	diana.p@corp.com	456-789-0123	2018-07-12	IT Manager	90000	2	NULL
105	Ethan	Hunt	ethan.h@corp.com	567-890-1234	2022-02-25	Marketing Lead	62000	4	NULL
106	Fiona	Hall	fiona.h@corp.com	678-901-2345	2017-11-01	Finance Manager	85000	3	NULL
107	Greg	Miles	greg.m@corp.com	789-012-3456	2023-04-15	IT Support	45000	2	104
108	Hannah	White	hannah.w@corp.com	890-123-4567	2021-09-05	HR Executive	50000	1	101
109	Ian	Scott	ian.s@corp.com	901-234-5678	2020-11-20	Operations Analyst	56000	5	NULL
110	Julia	Adams	julia.a@corp.com	012-345-6789	2019-12-18	Legal Advisor	70000	6	NULL

3. ProjectsTable

project_id	project_name	start_date	end_date	dept_id
201	PayrollSystem	2023-01-01	NULL	3
202	Website Upgrade	2023-02-10	NULL	2
203	RecruitmentDrive	2023-03-05	NULL	1
204	Ad Campaign	2023-05-20	NULL	4

205	NewCRMTool	2023-04-15	NULL	7
206	CompliancePortal	2023-06-10	NULL	6
207	InventorySystem	2023-07-01	NULL	5
208	AIRearch	2023-08-05	NULL	8
209	Customer Feedback	2023-09-10	NULL	10
210	ProcurementSystem	2023-10-01	NULL	9

4. Employee ProjectTable

emp_id	project_id	hours_allocated
102	202	120
104	202	80
103	201	100
106	201	150
101	203	50
105	204	70
107	202	60
109	207	90
110	206	110
108	203	40

SectionA:DDL(SchemaCreation&Modification)

1. WriteSQLstatementstocreatetheabovetableswiththespecifiedconstraints
2. AltertheEmployeestabletoaddacolumnbonusDECIMAL(8,2)withdefaultvalue0.
3. DropthecolumnbonusfromEmployees.

Section B: DML (Insert, Update, Delete)

4. Insert at least 10 rows into Departments, Employees, Projects, and Employee_Project.(use the above data set)
5. Tryinsertinganemployeewithanegativesalary(shouldfailduetoCHECK constraint).
6. Updatethesalaryoftheemployeewithemp_id=103by15%.
7. Deleteanemployeerecordwhohasresigned(chooseanyemp_id).
8. Increaseallemployees'salariesintheITdepartmentby5%.
9. Changethedepartmentofanemployeeto"Research".(shouldfailduetoFK constraint)

SectionC:DQL(SelectQueries)

10. Listallemployeesandtheirdetails.
11. Showallemployeesinthe"HR"department.
12. Findemployeeswithsalariesbetween50,000and80,000.
13. Retrieveemployeeshiredafter2020.
14. ShowemployeeswhoareineithertheITorFinancedepartment.
15. Findemployeeswhoseemailendswith"@corp.com".

16. Listalleemployeeswithsalary>60,000AND locatedin"New York".
17. Displayemployeesindescendingorderof salary.
18. Countthenumberofemployeesineach department.
19. Showtheaveragesalary ofemployeesdepartment-wise.
20. Displaydepartments wheretheaveragesalary isgreaterthan70,000.
21. Findthenumberof employeesineach project.
22. Displaydepartments withmorethan3employees.
23. Showthesumofallsalariesdepartment-wise.
24. ListalldistinctdepartmentIDs fromtheEmployees table.
25. Showemployeenameswiththeyeartheywerehired.
26. Showemployeesgroupedbytheyearof hire.
27. Listemployeehiredin thelast90 days.
28. Listthenoofyearsofexperienceofalltheemployees

Section D: Joins

29. Listalleemployeeswiththeirdepartmentnames(INNERJOIN).
30. Displayalldepartmentsalongwithemployees,includingthosedepartments without employees (LEFT JOIN).
31. Showemployeesandtheprojectstheyareworkingon(JOIN3tables:Employees, Employee_Project, Projects).
32. Listprojectsalongwithtotalhoursallocatedbyemployees.
33. Writeaquery to findemployeeswho areworking on morethan one project.
34. Showallprojectshandledbythe'Finance'department.

Section E: PL/SQL Programming

1. WriteaprocedureGetEmpInfothattakesemp_idasinputanddisplaysname,salary, and department.
2. WriteaPL/SQLblockthatchecksif anemployee'ssalaryisabove 50,000. Ifyes,print"HighSalary";Otherwiseprint"StandardSalary".
3. WriteaPL/SQLprogramto displaythetop10rowsintheEmptablebasedontheir job and salary
4. WriteastoredprocedureGiveBonusthattakesdepartmentIDandadesignationas input, along with a bonus amount, and updates the salary of all employees in that departmentwhohavethespecifieddesignationbyaddingthebonusamounttotheir current salary.
5. Createatriggertopreventinsertingemployeeswithasalarylessthan 30,000.
6. Createa trigger to avoid any transactions(insert, update, delete) on EMP table on Saturday & Sunday.

Note:The listofexperimentsisnotlimitedtothosementionedabove.Acomprehensivesetof programming or software tool-based exercises may be developed by the respective faculty members.

SEMESTER-IV

COURSE8:ADVANCEDACCOUNTING

Theory

Credits: 4

4hrs/week

Course Objectives

Thiscourseisdesignedtoenablestudentstoachievethefollowingobjectives:

- Understandthebasicprinciplesandproceduresofsingleentrysystemof accounting
- Dealwithbranchaccounting

- 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 debtors 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 dataset.
- 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

4hrs/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:RATIOANALYSIS

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
- Collection of financial statements of any two organizations for two years and prepare a 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, New Delhi.

SEMESTER-IV

COURSE 10: DATA SCIENCE USING PYTHON

Theory

Credits: 3

3hrs/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, UCIML 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*. Stack Abuse, 2020. Available via Stack Abuse.
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 map 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 a 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

2hrs/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 a 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 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.

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-V

COURSE 11: CORPORATE ACCOUNTING

Theory

Credits: 4

4 hrs/week


Dr. N. SREENIVASA CHARYULU
Chairman B.O.S. (U.G) Commerce
A.K. University, ONGLE.