DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
Chhatrapati Sambhajinagar.

NAAC- 'A^{+}' Grade

CIRCULAR /SU/Affiliated Colleges/ Comm. & Mang./29/2025

It is hereby inform to all concerned that, on the recommendation of the Dean, Faculty of Commerce & Managcment; **the Academic Council at its meeting held on 31st October, 2025 has been accepted the *Syllabus (MMS) Master of Management Science Second Year [Third & Fourth Sem] as per NEP -2020 Pattern of 2025-26 for the implemention of all concernerd affiliated colleges*** under the faculty of Commerce & Management.

This is effective from the Academic Year 2025-26 and Onwards as per appended herewith.

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Chhatrapati Sambhajinagar
431 004.
REF.NO. SU/COMM & MANG./2025-26
Date :- 13/ 11 /2025. 1828-31

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Deputy Registrar,
Syllabus Section.

Copy forwarded with compliments to :-

1] The Principal of all concerned affiliated colleges, Dr. Babasaheb Ambedkar Marathwada University. Chhatrapati Sambhajinagar
2] The Director, Board of Examination & Evaluation,
3] The Director, University Network & Information Centre, UNIC, with a **request to upload this Circular on University Website.**
4] The Deputy Registar, Post Graduate Section, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar.

Dr. Babasaheb Ambedkar Marathwada University
Chhatrapati Sambhajinagar - 431004(MS) India

Faculty of Commerce & Management

Curriculum of Master of Management Science (M.M.S.)

As per NEP-2020 Structure

With Choice Based Credit & Grading System

2 Year
Semester – III to IV

Run at College level from the

Academic Year 2025-26 & onwards

16/10/2025

Dr. Ashok Gaikwad

MMS Programme

MMS: Second Year

Level : 6.5

Semester III

Course Type	Course Code	Course Name	Scheme of Examination			No. of Credits
			UA	IA	Total	
Major	MMS/MAN/518	Database Management System	60	40	100	4
	MMS/MAN/519	Data Analytics	60	40	100	4
	MMS/MAN/520	Functional Management –I	60	40	100	4
	Activity-3rd (Choose any one from the basket) **MMS/ACT/521**	1. Android 2. PHP 3. Retail Management 4. Oracle (SQL/PL-SQL)			50	2 (*Pr)
	Elective-3 (Choose any one from the basket) **1.MMS/ELE/522 2.MMS/ELE/523 3.MMS/ELE/524**	1. Software Engineering & Testing 2. Tableau 3. Personality Development	60	40	100	4
Research Projects	**RP : 1st** **MMS/ RP /525**	Mini Project			100	4
Total			**330**	**220**	**550**	22
Total Credits for Third Semester is 22						

Note :- (*Pr) Means Practical Only

MMS : Second Year

Level : 6.5

Semester IV

Course Type	Course Code	Course Name	Scheme of Examination			No. of Credits
			UA	IA	Total	
Major	MMS/MAN/526	Programming in Python	60	40	100	4
	MMS/MAN/527	Data Communication Network	60	40	100	4
	MMS/MAN/528	Functional Management –II	60	40	100	4
	Elective-4 (Choose any one from the basket) 1.MMS/ELE/529 2.MMS/ELE/530 3.MMS/ELE/531	1. Computerised Accounting 2. ERP Management 3. R-Programming	60	40	100	4
Research Project	RP : 2nd MMS/ RP /532	Major Project			150	6
Total			**330**	**220**	**550**	22
Total Credits for Fourth Semester is 22						
Cum. Cr. For 2 year PG Degree **First Year PG Diploma 44 Credits – Second year 44 Credits = 88 Credits** **Credit Summary : Two years (Semester I to IV)** **1. Major Mandatory (1 to 12) : 48 credits** **2. Major Activity (1 to 3) : 06 credits** **3. Major Elective (1 to 4) : 16 credits** **4. RM 1 : 04 credits** **5. On Job Training/Field Project : 04 credits** **6. Research Projects (1 & 2) : 10 credits**						44

Master of Management Science (M.M.S.)

Semester End Examination

Theory / Numerical Question Paper Pattern as per NEP-2020

Time: - 2 Hrs.		Marks: 60
Note: - 1. Question No. 1 is Compulsory 2. Solve Any Four questions from Q. No. 2 to Q. No. 7		
Q. 1	Questions on Explaining Terms / Concepts / Elements / Definition (*Paper Setter may include Fill in Blanks / True or False / MCQs / Match the following Answer in one Sentence etc)	12 Marks
	A: - 6 Marks 1 2 3 4 5 6 B: - 6 Marks 1 2 3 4 5 6	
Q.2	Long Question / 2 Short Questions (6 Marks each)	12 Marks
Q.3	Long Question / 2 Short Questions (6 Marks each)	12 Marks
Q.4	Long Question / 2 Short Questions (6 Marks each)	12 Marks
Q.5	Long Question / 2 Short Questions (6 Marks each)	12 Marks
Q.6	Long Question / 2 Short Questions (6 Marks each)	12 Marks
Q.7	Short Notes (Any two, 6 Marks each) 1. 2. 3. 4.	12 Marks

PROGRAM: MMS

Semester III

Semester	:	III
Title of the Subject / course	:	Database Management System
Course Code	:	MMS/MAN/518
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: -
This course on Database Management Systems (DBMS) introduces fundamental concepts and practical skills for designing, implementing, and managing databases. It covers database models, SQL programming, normalization, query processing.

Prerequisites:
Familiarity with operating systems, file management, and using software tools and understanding of at least one programming language like C

Course Objectives (CO): -

CO1 Understand database management systems, including their architecture, models, and advantages over traditional data management methods.
CO2 Understand design and normalize database schemas using tools like Entity-Relationship (ER) diagrams and normalization techniques.
CO3 Understand SQL queries for data definition, manipulation, and retrieval, including advanced operations.
CO4 Understand principles of query processing, optimization, and transaction management, ensuring data integrity and efficient database performance.
CO5 Understand emerging trends and contemporary concepts in DBMS.

Learning Outcomes (LO): -

1. Students will be able to differentiate traditional file systems from DBMS, describe database models, and explain the architecture and advantages of modern database systems.
2. Students will understand relational concepts, keys, and perform basic relational algebra operations for efficient data querying and manipulation.
3. Students will understand ACID properties, address concurrency issues, and implement locking protocols for efficient and reliable database operations.
4. A commitment to lifelong learning and keeping up with evolving technologies.
5. Competency for higher studies and employability.

Course Outline: -
Unit I: Introduction to Database Systems:

Overview and History- Evolution of data management, Traditional file systems vs. DBMS, Definition and characteristics of DBMS, Types of databases, **Database Models**- Hierarchical

model, Network model, Relational model, **Architecture of DBMS**- Single-tier, two-tier, three-tier architectures, Database users and their roles, Advantages of DBMS

Unit 2: Relational Database Model:

Basic concepts- Concept of relations, attributes, and tuples, Primary key, foreign key, and candidate key, **Relational Algebra** Basic operations: Select, Project, Union, Difference, Cartesian Product.

Unit 3: Database Design:

Entity-Relationship (ER) Model, ER diagram (entities, attributes, relationships), **Conceptual Design- Introduction to SQL**- DDL (Data Definition Language), DML (Data Manipulation Language), **Constraints**: Domain constraints, Referential integrity, Check constraints.

Unit 4: Introduction to Normalization –

Functional dependencies, Normal forms (1NF, 2NF, 3NF, BCNF), **Schema Design** -Logical schema, Physical schema

Unit 5: Query Processing and Optimization:

Transactions and Concurrency Control Transactions: Properties (ACID), Concurrent execution and problems, Locking protocols (2PL, timestamp-based).

Text Books:

1.	"Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan
2.	"Fundamentals of Database Systems" by Ramez Elmasri and Shamkant B. Navathe
3.	"An Introduction to Database Systems" by C.J. Date
4.	"Database Management Systems" by Raghu Ramakrishnan and Johannes Gehrke
5.	"SQL, PL/SQL: The Programming Language of Oracle" by Ivan Bayross

Reference Books:

1.	**Database Systems: The Complete Book"** by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom
2.	**"Principles of Database and Knowledge-Base Systems"** by Jeffrey D. Ullman

Semester	:	III
Title of the Subject / course	:	Data Analytics
Course Code	:	MMS/MAN/519
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description :-

This subject build knowledge about data visualization, spreadsheet applications etc.

Prerequisites :

Basic knowledge of Excel

Course Objectives (CO) :-

To begin with, excel is a fundamental tool for data analysis, and mastering its functionalities is essential for any data analyst.

Learning Outcomes (LO) :-

1. Understanding the role of business analytics in decision-making
2. Mastering Excel functions for data analysis, including conditional formatting and pivot tables
3. Applying statistical methods such as hypothesis testing and regression analysis
4. Visualizing data using charts and dashboards
5. Introduction to advanced analytical tools.

Course Outline :-

Unit 1 : Basics of Business Analytics
Definition of Business Analytics,
Key Components: Data Collection, Data Processing, Data Analysis, Data Visualization, Decision-Making.
Types of Business Analytics: Descriptive Analytics, Predictive Analytics, Prescriptive Analytics, Diagnostic Analytics.
Tools and Technologies, Role of Data in Business Analytics, Applications of Business Analytics, Benefits of Business Analytics

Unit 2: Excel Conditional Formatting and Key Functions
What is Conditional Formatting?
Types of Conditional Formatting: Highlight Cells Rules, Top/Bottom Rules, Data Bars, Color Scales, Icon Sets
How to Apply Conditional Formatting, Managing and Clearing Conditional Formatting
Key Functions in Excel
SUM Function, AVERAGE Function, COUNT and COUNTA Functions, IF Function, VLOOKUP and HLOOKUP Functions, SUMIF and COUNTIF Functions, CONCATENATE and TEXTJOIN Functions, INDEX and MATCH Functions, TEXT Functions (LEFT, RIGHT, MID),
Combining Conditional Formatting with Functions
Using Conditional Formatting with the IF Function, Dynamic Formatting

Unit 3: Pivot Tables

Introduction to Pivot Tables, What is a Pivot Table?, Why Use Pivot Tables?, Creating a Pivot Table, Pivot Table Layout, Grouping Data, Filtering and Sorting Pivot Tables, Pivot Table Design and Customization, Advanced Pivot Table Features, Applications of Pivot Tables in Business Analytics

Unit 4: Creating Interactive Dashboards in Excel

Structuring Your Data for Dashboards, Key Elements of an Excel Dashboard, Enhancing Interactivity, Design Tips for Dashboards. Layout, Color Scheme, Labels and Legends

Unit 5: Best Practices for Presenting Data

Know Your Audience, Focus on Actionable Insights, Maintain Data Integrity

Text books :

1	"Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking" Authors: Foster Provost & Tom Fawcett Publisher: O'Reilly Media
2	"The Big Book of Dashboards: Visualizing Your Data for Better Business Decisions" Authors: Steve Wexler, Jeffrey Shaffer, and Andy Cotgreave Publisher: Wiley
3	"Python for Data Analysis" Author: Wes McKinney Publisher: O'Reilly Media
4	"Data Analytics Made Accessible" Author: Anil Maheshwari Publisher: CreateSpace Independent Publishing
5	"Practical Statistics for Data Scientists: 50 Essential Concepts" Authors: Peter Bruce, Andrew Bruce, and Peter Gedeck Publisher: O'Reilly Media

Reference books:

1	"The Art of Data Science" Authors: Roger D. Peng and Elizabeth Matsui Publisher: CreateSpace Independent Publishing
2	"Data Visualization: A Practical Introduction" Author: Kieran Healy Publisher: Princeton University Press
3	"Storytelling with Data: A Data Visualization Guide for Business Professionals" Author: Cole Nussbaumer Knaflic Publisher: Wiley

Semester	:	III
Title of the Subject / course	:	Functional Management – I (Marketing Management)
Course Code	:	MMS/MAN/520
Credits	:	04
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: -

Prerequisites: Basic knowledge about marketing

Course Objectives (CO): -

CO1: Use Marketing information and research to develop Marketing strategies

CO2: Understand the Nature, Scope and basic Marketing Concepts and Strategies.

CO3: Give complete relationship between Marketing and other Management functions.

CO4: Learn to identify the essential Elements for effective Marketing practice.

CO5: Identify the foundation terms and concepts that are commonly used in Marketing.

Learning Outcomes (LO): -

LO1: Develop strategies with clients, customers, and consumers* and others to grow and maintain relationships.

LO2: Develop learning and development strategies to enhance professional growth in the field.

LO3: Can Prepare a marketing plan that will meet the needs or goals of a business or organization.

Course Outline: -

Unit 1: - Meaning, Scope and significance of marketing-marketing system, concepts of marketing - approaches to the study of marketing.

Unit 2: -Meaning and function of Marketing, Types of marketing organization - duties and responsibilities of a marketing manager, types of market.

Unit 3: - Marketing planning: Meaning, importance, process. Marketing mix: Types, importance. Marketing strategy,

Unit 4: - Market research (Methods research in marketing-Questionnaires, collection and analysis information). Marketing information system: Features Use of MIS, building a MIS.

Text books:

1	Kotler Philip : Principles of Marketing
2	Mamdria Satish : Marketing Management Himalaye Pub.
3	Sherlekar S.A. : Marketing management

Reference books:

1	Davar Rustom. S. : Modern Marketing Management : Progressive Corporation Pvt. Ltd.

2	Kotlar Philip : Marketing Management : Analysis Planning and Control. (Prentice Hall of India.)
3	Winklar John : Marketing Planning Associated Business Programmes.
4	Marketing Management-Planning Implementation and Control, Ramaswamy. V S &Namakumari. S,Macmillan Business Books, New Delhi, 2002

Semester	:	III
Title of the Subject / course	:	Android
Course Code	:	MMS/ACT/521-1
Credits	:	2
Marks	:	Marks :50 (UA: 30 + IA: 20)

Course Description: -

Gain knowledge of the Android operating system and its architecture, understand the basic components of an Android application, such as Activities, Services, Broadcast Receivers, and Content Providers.

Prerequisites: Java or object-oriented programming experience.

Course Objectives (CO) :- This course facilitates classroom and laboratory learning, letting students develop competence and confidence in android programming and understand the entire Android Apps Development Cycle

Learning Outcomes (LO) :- Demonstrate the Understanding of fundamental of Android Programming. (Understand) • Build their ability to develop software with reasonable complexity on mobile platform. (Apply)

Course Outline :-

Unit 1 : Basic of Android Programming: Introduction to Android OS features, Setting up the Android Application Development Environment, Setup Java Development Kit (JDK), Android SDK, Eclipse IDE, Android Development Tools (ADT) Plugin, Create Android Virtual Device.

Unit 2: Android Architecture:

Linux kernel, Libraries, Android Runtime, Application Framework. Application Components Application Components Activities, Services, Broadcast Receivers, Content Providers, Additional Components, Create Android Application, Anatomy of Android Application, The Main Activity File, The Manifest File, The Strings File, The R File, The Layout File, Running the Application.

Unit 3: Android UI Layouts

Android Layout Types, Relative Layout Attributes, Grid View Attributes, Sub-Activity, Layout Attributes, View Identification, UI Controls, Android UI Controls, TextView Attributes, AutoComplete Text View Attributes, Button Attributes, ImageButton Attributes, CheckBox Attributes, ToggleButton Attributes, RadioButton Attributes, RadioGroup Attributes

Unit 4: Resources Organizing & Intents:

Alternative Resources, Accessing Resources ,Intent Objects, Action, Android Intent Standard Actions, Data, Category, Extras, Flags, Component Name, Types of Intents: Explicit Intents, Implicit Intents.

Unit 5: Android Event Handling, Styles,Sqlite:

Event Listeners & Event Handlers, Event Listeners Registration, Styles and Themes, Defining Styles, Using Styles, Style Inheritance, Android Themes SQLite primer, Store data using SQLite database

Text books :

1	"Android Programming: The Big Nerd Ranch Guide" by Bill Phillips, Chris Stewart, and Kristin Marsicano
2	**"Head First Android Development: A Brain-Friendly Guide" by Dawn Griffiths and David Griffiths**
3	**"Android Apprentice: Beginning Android Development with Kotlin" by raywenderlich Team**
4	Programming android by Zigurd Mednieks
5	Android Developer Fundamental Course by Google

Reference books:

1	Android Development by Tutorialspoints.com
2	Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps byIan G. Clifton

Semester	:	III
Title of the Subject / course	:	PHP Programming
Course Code	:	MMS/ACT/521-2
Credits	:	2
Marks	:	Marks :50 (UA: 30 + IA: 20)

Course Description: -Use PHP to generate dynamic web pages by interacting with HTML forms, cookies, and sessions., Develop server-side scripts to handle user input and manage user sessions

Prerequisites: Basic Knowledge of HTML, CSS and SQL.

Course Objectives (CO): - This course facilitates classroom and laboratory learning, letting students develop competence and confidence in PHP programming and understand the web application development

Learning Outcomes (LO): - Demonstrate the Understanding of fundamental of PHP Programming. (Understand) Learn Data base operations with MYSQL and PHP. (Apply)

Course Outline: -

Unit 1: Introduction: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.) PHP with other technologies, scope of PHP Basic Syntax, PHP variables and constants Types of data in PHP, Expressions, scopes of a variable (local, global) PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator. PHP operator Precedence and associativity

Unit 2: Handling HTML form with PHP: Capturing Form Data GET and POST form methods Dealing with multi value fields Redirecting a form after **submission PHP conditional events and Loops:** PHP IF Else conditional statements (Nested IF and Else) Switch case, while, For and Do While Loop Goto, Break, Continue and exit

Unit 3: PHP Functions: Function, Need of Function, declaration and calling of a function PHP Function with arguments, Default Arguments in Function Function argument with call by value, call by reference Scope of Function **Global and Local String Manipulation:** Creating and accessing String, Searching & Replacing String Formatting joining and splitting String , String Related Library functions Use and advantage

Unit 4: Array: Anatomy of an Array, Creating index based and Associative array, Accessing array Looping with Index based array, with associative array using each () and foreach()

Unit 5: Working with Databases (MySQL)-Introduction to relational databases, MySQL database setup and configuration, Performing CRUD operations using PHP and MySQL

Text books:

1	"PHP: The Complete Reference Paperback", Steven Holzner, McGraw Hill Education

	(India), 2007.
2	"PHP and MYSQL (Create-Modify-Reuse)", Timothy Boronczyk, Martin E. Psinas, Wiley India Private Limited, 2008.
3	"Learning PHP, MySQL, JavaScript, CSS & HTML5", Robin Nixon, 3rd Edition Paperback, O'reilly, 2014.

Reference books:

1	PHP and MySQL Web Development", Luke Welling, Laura Thompson, 4th Edition, Addition Paperback, Addison-Wesley Professsional,2008..
2	David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014
3	https://www.w3schools.com/php/ Php Programming
4	https://www.tutorialspoint.com/php/index.htm php Programming

Semester	:	III
Title of the Subject / course	:	Retail Management
Course Code	:	MMS/ACT/521-3
Credits	:	2
Marks	:	Marks: 50 (UA: 30 + IA: 20)

Course Objectives (CO): -

CO1: Understanding of retailing, examining the retail landscape.
CO2: Addressing current trends within the industry.
CO3: The retail sector evolves, successful businesses must be recognizing, adapting, and strategically planning for transformations.

Learning Outcomes (LO): -

LO1: Become familiar with the fundamental concepts and how the retail industry works.
LO2: Able to understand the impact of retailing on the economy and its role in society.
LO3: To be able to make decisions involved in running a retail firm and the concepts and principles for making those decisions.
LO4: Understand the areas of accountability for retail management.

Course Outline: -

Unit 1: Retail Business Environment: Concept of retailing, Functions of retailing, Terms & Definition, Introduction to Retailing and Retail types, Retailing Channels, Retail Industry in India, Changing trends in retailing.

Unit 2: Retail Market Segmentation & Strategies: Market segmentation, Retail strategy, Business Location, Merchandise: types of merchandise, planning, Store operation, Retail Promotion strategy, Retail services.

Unit 3: Retail Franchise: Introduction to franchising, advantages and disadvantages of franchising to franchisee and franchisor, types of franchises, Franchise agreement and Franchise Disclosure Document, Risks in franchising, Indian and global franchising scenario.

Unit 4 : E – Retailing: Introduction, Types of Technology in Retailing, Role of IT in Business; Influencing Parameters for use of IT in Retailing; Efficiency in Operations, Effective Management of Online catalogues.

Text books:

1	Giri, Arunangshu, Paul, Pradip, Chatterjee, Satakshi. PHI Learning Pvt. Ltd., 1 Dec 2020
2	Retail Management: An Effective Management Strategy for Retail Store Managers. Prabhu TT.,Nestfame Creations Pvt. Ltd., 21 Apr 2019

Reference books:

1	Retail Management, S.C. Bhatia, Atlantic Publishers & Dist, 2008
2	Gibson G. Vedamani Retail Management Pearson
3	Retail Management: A Strategic Approach, 10/E by Berman

Semester	:	III
Title of the Subject / course	:	Oracle (SQL/PL-SQL)
Course Code	:	MMS/ACT/521-4
Credits	:	2
Marks	:	Marks: 50 (UA: 30 + IA: 20)

Course Description: -

This course provides foundational knowledge and practical skills needed to work with Oracle Databases, focusing on SQL (Structured Query Language) for querying and managing data, and PL-SQL (Procedural Language/SQL) for developing complex and efficient database-driven applications. This course is ideal for beginners and those who wish to strengthen their knowledge of Oracle database technologies

Prerequisites:

Familiarity with Databases: A general understanding of databases and how they store and manage data is beneficial, though not required.

Course Objectives (CO):-

Understand Database Fundamentals: Provide students with an understanding of the concepts and architecture of relational databases and the Oracle Database system. Learn SQL Basics: Equip students with the skills to write basic SQL queries for retrieving, inserting, updating, and deleting data from Oracle databases.

Learning Outcomes (LO) :-

By the end of the course, students will be able to:

1. Write Basic SQL Queries
2. Use SQL Functions and Clauses
3. Understand and Implement SQL Joins:
4. Work with Subqueries and Set Operations:
5. Create and Use PL-SQL Blocks

Course Outline:-

Unit 1 :

Introduction to Oracle and SQL Basics

Introduction to Database Management Systems (DBMS) and Oracle Database, Key concepts: Tables, Rows, Columns, Keys, and Relationships, Types of databases: Relational vs Non-relational, SQL Overview and its role in querying databases, SQL Syntax and Structure, Basic SQL Operations: **SELECT, WHERE, ORDER BY**, Basic Data Types in SQL, SQL Querying Example

Lab Exercises:

- Creating a simple database and table
- Running basic SELECT queries

Unit 2: Data Manipulation and Transaction Control in SQL

INSERT, UPDATE, DELETE, COMMIT and ROLLBACK, TRUNCATE, SAVEPOINT

Lab Exercises:

- Inserting, updating, and deleting records
- Implementing transaction control using COMMIT, ROLLBACK, and SAVEPOINT

Unit 3: SQL Joins, Subqueries, and Set Operations

JOINS: INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL OUTER JOIN
Subqueries: Single-row vs Multi-row Subqueries, Correlated Subqueries

Set Operations: UNION, INTERSECT, and EXCEPT, Working with Duplicate vs Unique Results

Lab Exercises:

- Writing and executing SQL JOIN queries
- Creating subqueries to retrieve nested data
- Using set operations to merge query results

Unit 4: Introduction to PL-SQL (Procedural Language/SQL)

What is PL-SQL? Difference between SQL and PL-SQL, Declaring Variables in PL-SQL, Writing Simple PL-SQL Blocks, Control Structures in PL-SQL, IF-THEN-ELSE , LOOP, WHILE LOOP, FOR LOOP, Exception Handling in PL-SQL, Handling Errors using EXCEPTION block, Basic PL-SQL Program Structure, DECLARE, BEGIN, EXCEPTION, and END

Lab Exercises:

- Writing simple PL-SQL anonymous blocks
- Using control structures to automate database processes
- Implementing exception handling

Unit 5: Advanced PL-SQL Concepts and Procedures

Stored Procedures: Syntax and Structure of Stored Procedures, Parameterized Procedures, CALL Statement to Execute Procedures, **Functions**: Creating and Using Functions in PL-SQL, Differences between Procedures and Functions, Using Functions to Return Values, **Triggers**: Automating Tasks with Triggers, Types of Triggers: BEFORE, AFTER, and INSTEAD OF, Trigger Execution Flow, **Cursors**: Using Implicit and Explicit Cursors for Row-by-Row Processing, Declaring, Opening, Fetching, and Closing Cursors

Lab Exercises:

- Creating and invoking stored procedures and functions
- Writing triggers to automate database actions
- Working with cursors and package creation

Text books :

1	"Oracle SQL by Example" Author: Alice Rischert Publisher: Prentice Hall
2	"Oracle PL/SQL Programming" Author: Steven Feuerstein Publisher: O'Reilly Media
3	"Learning SQL" Author: Alan Beaulieu Publisher: O'Reilly Media

Reference books:

1	"SQL in 10 Minutes, Sams Teach Yourself" Author: Ben Forta Publisher: Sams Publishing
2	Oracle SQL: The Essential Reference Author: David C. Kreines Publisher: O'Reilly Media

Semester	:	**III**
Title of the Subject / course	:	**Software Engineering and testing**
Course Code	:	**MMS/ELE/522**
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: - This course provides comprehensive introduction to Software Engineering, covering the fundamentals of software development, process models, and project management. Students will explore essential topics, including software design, coding, testing, quality assurance, and emerging software technologies. Emphasis is placed on systematic approaches to software development and the application of industry standards for producing reliable, efficient, and high-quality software solutions.

Prerequisites: - Object Oriented Programming fundamental.

Course Objectives (CO): -

- To study Software Development Life Cycle, Development models and Agile Software development.
- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test; integration,
- regression, and system testing.
- To learn the process of improving the quality of software work products.
- To understand different Quality Standards.

Learning Outcomes (LO): -

After learning the course, the students should be able to:

- Prepare SRS (Software Requirement Specification) document and SPMP (Software Project Management Plan) document.
- Apply the concept of Functional Oriented and Object-Oriented Approach for Software Design.
- Recognize how to ensure the quality of software product, different quality standards and software review techniques.
- Apply various testing techniques and test plan in.
- Able to understand modern Agile Development

Course Outline: -

Unit – 1 Introduction to Software and Software Engineering

What is Software- Definition, The Evolving Role of Software, Software Myths, Software Engineering: Definition, Software Engineering -A Layered Technology, Changing Nature of Software, legacy software. Software

Unit - 2: Introduction to Process Models

Process Models: SDCL, The Linear Sequential Model, The Prototyping Model, The RAD Model, Evolutionary Process Models, Agile Process Model, Component - Based Development Process, Product and Process. Agility and Agile Process model, Extreme Programming.

Unit - 3 Managing Software Project

Project Scheduling & Tracking, Risk Analysis & Management (Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation). Understanding the Requirement, Software Requirement Specification (SRS), Requirement Analysis and Requirement Elicitation, Requirement Engineering. Design Concepts and Design Principal, Architectural Design, Component Level Design, User interface design: Golden rules.

Unit - 4 Software Coding & Testing

Testing Strategies: Testing Techniques and Test Case, Test Suites Design, A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, unit testing, integration testing, regression, System testing.

Unit - 5 Quality Concepts

Quality Concepts and Software Quality Assurance, Software Reviews (Formal Technical Reviews), Software Reliability, The Quality Standards: ISO 9000, CMM, Six Sigma for SE, SQA Plan

Text Books:

1.	Roger S.Pressman, Software Engineering- A practitioner's Approach, McGraw-Hill International Editions
2.	Ian Sommerville, Software engineering, Pearson education Asia
3.	Pankaj Jalote, Software Engineering – A Precise Approach Wiley
4.	Behhforoz & Frederick Hudson, Software Engineering Fundamentals, OXFORD
5.	Rajib Mall, Fundamentals of software Engineering, Prentice Hall of India.

Reference Books:

1.	Testing Computer Software" by Cem Kaner, Jack Falk, and Hung Quoc Nguyen
2.	The Mythical Man-Month: Essays on Software Engineering" by Frederick P. Brooks

Semester	:	III
Title of the Subject / course	:	Tableau
Course Code	:	MMS/ELE/523
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: -

Tableau skills and basics that are needed to create visually appealing, highly informative reports and data visualizations.

Prerequisites: -

Basic knowledge of database and queries and some statistical concepts.

Course Objectives (CO) :-

- Understand the basic concepts and interface of Tableau.
- How to connect to various data sources and perform basic data preparation.
- Create basic visualizations using Tableau's drag-and-drop functionality

Learning Outcomes (LO) :-

By the end of the syllabus, students will be able to:

1. Understand Tableau's interface and connect to various data sources.
2. Create basic visualizations and dashboards.
3. Perform simple data analysis and calculations.
4. Publish and share visualizations and dashboards for collaborative work.
5. Understand the foundational concepts behind more advanced Tableau features.

Course Outline :-

Unit 1 : Introduction to Tableau

What is Tableau? Overview of its features and benefits, Different versions of Tableau: Tableau Desktop, Tableau Server, Tableau Online, and Tableau Public.
Tableau Architecture: Data Sources, Data Connections, Workbooks, and Dashboards.
Installation and Setup of Tableau Desktop, Introduction to Tableau Interface:
Main Menu, Toolbar, Data Pane, Shelves (Rows, Columns, Marks), and the View Area.
Types of Tableau Files: .twb, .twbx, .twbx.
Connecting to Data Sources: Excel, CSV, Text, and Web Data Connectors.
Introduction to Tableau Data Engine. Basic Data Types and Terminology in Tableau: Dimensions, Measures, and Fields.

Unit 2: Data Connections and Data Preparation

Connecting to different data sources in Tableau (Excel, SQL, Web Data Connectors, etc.).,
Understanding Data Connections: Live vs. Extract, Data Source Pane and Overview of Data Source Tab.
Working with Data: Filtering and Sorting Data, Renaming and Removing Fields, Changing Data Types.
Creating Basic Calculations: Creating calculated fields for data manipulation, Basic calculations like SUM, AVG, COUNT
Data Blending and Joins: Inner Join, Left Join, Right Join, Full Outer Join.

Introduction to Data Relationships and Metadata.

Unit 3: Building Simple Visualizations

Understanding the different types of charts in Tableau: Bar, Line, Pie, Scatter Plot, Maps, and Histograms.
Building your first visualization: Dragging and dropping Dimensions and Measures, Using the "Show Me" feature for chart recommendations.
Working with Marks Card: Color, Size, Shape, Label, Tooltip, and Detail.
Creating Basic Aggregations and Grouping Data: SUM, AVG, COUNT, and creating groups.
Using Filters in Visualizations: Dimension Filters, Measure Filters, Top N Filters.
Formatting Visualizations: Formatting Fonts, Axis, and Labels, Creating Dual-Axis and Combined Axis Charts.

Unit 4:

What is a Dashboard? Combining multiple visualizations.
Building a Dashboard: Adding and arranging sheets (visualizations), Sizing and formatting dashboards.
Interactivity in Dashboards: Filters, Highlight Actions, and URL Actions, Adding Navigation buttons.
Designing a Dashboard for End-Users: Best practices for layout, user experience, and efficiency.
Storytelling in Tableau: What is a Story and how it can be used to present data visually, Creating a Story using sheets and dashboards, Storytelling best practices.
Exporting and Sharing Dashboards: Publishing to Tableau Server, Tableau Online, or Tableau Public.

Unit 5:

Trend Lines, Reference Lines, and Reference Bands.
Using Tables and Crosstabs for Detailed Analysis.
Introduction to Table Calculations: Running Total, Moving Average, Percent of Total.
Introduction to Level of Detail (LOD) Expressions: FIXED, INCLUDE, and EXCLUDE LODs.
Using Parameters in Tableau: How parameters work and creating dynamic controls for your visualizations.
Overview of Tableau Prep for Data Preparation and Cleaning.
Introduction to Tableau Public: Sharing and publishing workbooks online.

Text books :

1	Tableau Desktop Pocket Reference, Author: Ryan SleeperPublisher: O'Reilly Media, 1st edition (August 3, 2021)
2	Tableau 10 Complete Reference, Authors: Joshua N. Milligan and Tristan Guillevin, Publisher: Packt Publishing (December 2018)

Reference books:

1	Tableau 9: The Official Guide, Author: George Peck, Publisher: McGraw-Hill Education (October 1, 2015)
2	Hands-On Data Visualization: Interactive Storytelling from Spreadsheets to Code, Authors: Jack Dougherty and Ilya Ilyankou, Publisher: O'Reilly Media (2021)

Semester	:	III
Title of the Subject / course	:	Personality Development
Course Code	:	MMS/ELE/524
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: - This Personality Development course provides a comprehensive understanding of key concepts to enhance personal growth and professional success. It begins with an introduction to personality development, focusing on factors that shape an individual's traits and behaviour. Students will explore the role of attitude and motivation in achieving personal goals, followed by building healthy self-esteem. The course delves into various aspects of personality, including emotional intelligence, communication, and leadership. Lastly, it examines the concept of Employability Quotient, equipping learners with skills and strategies to boost career readiness in today's competitive job market

Prerequisites: Basic Communication Skills, Self-awareness, Interest in Personal Growth, Time Management and Organization Skills

Course Objectives (CO): -

1. Introduction to Personality Development
2. Attitude & Motivation
3. Introduction to Concept of Self-esteem
4. Learning of Aspects of Personality Development
5. Skills of Employability achievements

Learning Outcomes (LO): -

1. Students will gain a comprehensive understanding of personality development, identifying key factors that influence personal traits and behaviours.
2. Learners will understand the significance of positive attitude and motivation in achieving personal goals
3. Students will develop the ability to recognize and improve their self-esteem, learning strategies to foster self-worth and confidence
4. Students will explore various dimensions of personality, including emotional intelligence, communication skills, leadership, and social adaptability
5. Learners will acquire the skills to enhance their Employability Quotient (EQ), including career-building strategies, professional communication, and the ability to work in teams

Course Outline: -

Unit 1: Introduction to Personality Development

The concept of personality - Dimensions of personality – Theories of Freud & Erickson- Significance of personality development. The concept of success and failure: What is success? -

Hurdles in achieving success - Overcoming hurdles - Factors responsible for success – What is failure - Causes of failure. SWOT analysis.

Unit 2: Attitude & Motivation

Attitude - Concept - Significance - Factors affecting attitudes - Positive attitude – Advantages – Negative attitude- Disadvantages - Ways to develop positive attitude - Differences between personalities having positive and negative attitude. Concept of motivation - Significance – Internal and external motives - Importance of self- motivation- Factors leading to de-motivation

Unit 3: Self-esteem

Term self-esteem - Symptoms - Advantages - Do's and Don'ts to develop positive self-esteem – Low self- esteem - Symptoms - Personality having low self-esteem - Positive and negative self-esteem. Interpersonal Relationships – Defining the difference between aggressive, submissive and assertive behaviors - Lateral thinking.

Unit 4: Aspects of Personality Development

Body language - Problem-solving - Conflict and Stress Management - Decision-making skills - Leadership and qualities of a successful leader – Character building -Team-work – Time management - Work ethics –Good manners and etiquette

Unit 5: Employability Quotient

Resume building- The art of participating in Group Discussion – Facing the Personal (HR & Technical) Interview -Frequently Asked Questions - Psychometric Analysis - Mock Interview Sessions

Text books:

1	Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill
2	Stephen P. Robbins and Timothy A. Judge(2014), *Organizational Behavior 16th Edition*: Prentice Hall

Reference books:

1	Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi. Tata McGraw-Hill 1988
2	Heller, Robert. Effective leadership. Essential Manager series. Dk Publishing, 2002
3	Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
4	Pravesh Kumar. All about Self- Motivation. New Delhi. Goodwill Publishing House. 2005
5	Lucas, Stephen. Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill. 2001

Semester	:	III
Title of the Subject / course	:	Mini Project
Course Code	:	MMS/RP/525
Credits	:	04
Marks	:	Marks: 100 (UA: 100)

Course Description: - A mini project is an assignment that the student needs to complete at the end of 3rd semester to strengthen the understanding of fundamentals through effective application of the subjects learnt.

Course Objectives (CO): -

CO1: Create working practical project using tools and techniques learnt entire semester

CO2: Develop an application using the languages and concepts learnt in the theory and practical.

Learning Outcomes (LO):-

Student will come to know about practical applicability of the subject learnt

Guidelines for Mini Project:

1. The student may take up the mini project in the 3rd semester based on the courses learnt in all semester.
2. The student may take up the project individually.
3. Selected project/module must have relevant scope as per the marks assigned and must be carried out in the Institute.
4. Internal Project guide should monitor and evaluate the progress of the project on individual basis.
5. The Project Synopsis should contain an Introduction to Project clearly stating the project scope and usefulness.
6. Students are expected to show working demo of the project during final evaluation.
7. Students are expected to submit the soft copy and Hard copy of mini project report as a part of final submission.
8. The project will carry 100 mark and evaluation is done as per official guidelines

PROJECT GUIDE LINES(STRUCTURE)
1. INTRODUCTION:
a. Company profile . Vision ,Objectives , Policies . Future planning
b. Details of promoters
2. TOPIC FOR PROJECT:
a. Brief introduction of topic
b. Objectives of the study
c. Scope of the study
3. METHODOLOGY OF THE STUDY:
a. Source of collection of primary data
b. Source of collection of secondary data
4.STUDY OF LITRETURE (Theoretical detail of the project)
4.DATA ANALYSIS AND INTERPRETATION (MAIN STRUCTURE OF THE PROJECT RELATED STUDY TOPICS)
Diagrammatically representation of DATA/ INFORMATION:
a. Charts and Data tables
b. Graph
5. FINDING
6 LIMITATIONS IN DATA COLLECTION
7. SUMMARY & CONCLUSION
8. BIBLIOGRAPHY
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PROGRAM: MMS

Semester IV

Semester	:	IV
Title of the Subject / course	:	**Programming in Python**
Course Code	:	**MMS/MAN/526**
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: -
Python programming course typically outlines the skills, knowledge, and competencies that students are expected to achieve by the end of the course

Prerequisites: Basic Knowledge of programming, Algorithm, flowchart and open source and closed source operating system.

Course Objectives (CO):- This course facilitates classroom and laboratory learning, letting students develop competence and confidence in Python programming and understand the entire Python packages and modules

Learning Outcomes (LO) :- Demonstrate the Understanding of fundamental of Python Programming. (Understand) • Build their analyse and use dataset with Python programming with different Environments. (Apply)

Course Outline: -
Unit 1 : Introduction : Introduction to Python- Python as scripting Language, Programming language Vs Scripting Language (C vs Python), Advantages, Enviorment, IDE Python's Technical Strength, Application in different domains.

Unit 2: Python's building blocks- Identifiers, Keywords, Variables, Constants, Indentation, Comments in python, Python's Data Types – Numbers, Strings, List, Tuples, Dictionaries, Sets, Input and Output statements in python, Operators in Python- Operators as Arithmetic, Assignment, Unary Minus, Relational, Logical, Boolean, Bitwise, Membership, Identity, Operator precedence and Associativity

Unit 3: Control Statements in Python Types of Control Statements – Decision making statements, looping statements, Decision Making Statements: - if, if.... else, else-if ladder, nested if and switch statement, looping statement: - while loop, for loop, nested loop, Manipulating Loops- use of break, continue and pass statements

Unit 4: Functions with Basic OOP concepts - Use of python built in functions (e.g. type/data conversion functions, math and string functions), User defined function- Function definition, function calling, function arguments and parameter passing, return statement, scope of variables (Global and Local Variables) **Basic OOP concepts**- Introduction to object-oriented programming, Creating classes and objects, Constructors and Destructors in python, Data abstraction and Encapsulation

Unit 5: Modules and Packages in Python - Writing modules, importing module, python built in modules (Numeric and mathematical module, Functional Programming Module) Python packages-

Introduction, writing python packages, using standard packages (NumPy, matplotlib) and user defined package statements

Text books:

1	Natural Computing with Python , by Giancarlo Zaccone BPB, ISBN:9789388511612
2	Core Python Programming by Dr. R. Nageswara Rao DREAMTECH PRESS, ISBN: 978- 9386052308
3	Python Essential Reference Addison-Wesley Professional ,David Beazley, ISBN: 978-0672329784

Reference books:

1	Python: The Complete Reference Martin C. Brown Tata McGraw Hill ISBN: 9789387572942
2	Let Us Python by Yashwant Kanetkar BPB, ISBN: 978-9391392253
3	https://www.w3schools.com/python/ Python Programming
4	https://www.tutorialspoint.com/python/index.htm Python Programming

Semester	:	IV
Title of the Subject / Course	:	Data Communication Network
Course Code	:	MMS/MAN/527
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description :-

Prerequisites :

Basic knowledge of computer architecture and operation. Familiarity with hardware components like processors, memory, and storage.

Course Objectives (CO) :-

1. The basic concepts of data communication systems, including their components and functionalities.
2. Provide detail understanding of data transmission methods, including analog and digital signals, and various transmission modes.
3. Understanding Guided and Unguided media.
4. Understanding network and its topologies.
5. Understanding Modulation, Multiplexing, Switching and OSI Model.

Learning Outcomes (LO) :-

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

1. Understand Core Concepts.
2. Analyse Data Transmission.
3. Classify Transmission Modes.
4. Evaluate Transmission Media.
5. Design and Implement Networks.

Course Outline :-

Unit 1 : Introduction to Communication

Communication System, Components of communication system. Forms of data transmission: Analog and Digital Signal, Advantages & Application of Computer network, Methods of data transmission: Synchronous and Asynchronous, Mode of data transmission: Simplex, Half Duplex and Full Duplex, Point to Point and Multi point channel Configuration. Data transmission : Parallel and Serial.

Unit 2: Transmission Media

Guided and Unguided media, Twisted pair, Coaxial cable, Optical fiber cable, Radio waves, Microwaves, Satellite Communication.

Unit 3: Network Topologies

LAN, MAN, WAN, Topology : Bus, Star, Mesh, Tree, Ring.

Unit 4: Modulation & Multiplexing

Concept of Modulation and Demodulation, Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK),Concept of Multiplexing, Frequency division Multiplexing (FDM), Time Division Multiplexing (TDM).

Unit 5: Data Networks

Concept of Switching, Circuit Switching, Packet Switching, Network Protocol, OSI Model.

Text books :

1	Introduction to Digital and Data Communications, Michal A. Miller, JAICO publishing.
2	Data Communication and Networking, C.S.V. Murthy, Himalaya Publishing House
3	Data Communication and Networking, Behrouz A. Forouzan, Mc Graw Hill Publication.

Reference books:

1	Computer Networks, A.S. Tanenbaum, David J. Wetherall, Prentice Hall Publication.
2	Data Communication and Distributed Networks, U.D. Black, Prentice Hall Publication.

Semester	:	IV
Title of the Subject / course	:	**Functional Management – II**
Course Code	:	MMS/MAN/528
Credits	:	04
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Prerequisites: Basic knowledge about Human Resource.

Course Objectives (CO): -

CO1: To understand the foundation and the need to have performance management by the organization.
CO2: To understand the concepts, theories and the legal issues that are associated with the performance appraisal
CO3: To explain the concept of reward management and the ways in which organization links with the performance.
CO4: Understand the meaning of Employee relations real industrial relations
CO5: : To gain an understanding on the basics of employee counselling, its need and goals.

Learning Outcomes (LO): -

LO1: Assess various recruitment and selection strategies, processes, and laws
LO2: Evaluate various methods of performance management and employee appraisal
LO3: Discuss the rights and responsibilities of employees and their employers.
LO4: Contribute to employee performance management and organizational effectiveness
LO5: Evaluate the key factors that play a role in analysing employee performance and how the reward system functions

Course Description: -

Unit 1: Meaning, Scope and Functions. Procurement of man power-staffing process - job analysis requirement and selection.

Unit 2: Development of man power-training and methods of training and development. Compensation: Wage and salary administration method of wage payment -incentive plans- profit sharing and fringe benefits.

Unit 3: Maintenance of Human Resources: Personal health and safety - occupational health problems - personal management and occupational safety quality of work life. Labor welfare:

Unit 4: Performance Appraisal: Meaning, Importance and methods of performance Appraisal - past oriented and future oriented appraisal method - implications appraisal.

Unit 5: Industrial Relations: Meaning and causes of disputes methods of preventing and settling disputes - workers participation in management.

Text books:

1	Subramaniam L.R. : General Management & Personnel Management Text Causes.
2	Flippo B.B. : Principles and Practice of Business Organisation & Management S. Chand & C.
3	Principles and Practices of management by shejwalkar
4	Organisational behaviour by Stephen Robbins

Reference books:

1	Yoder Personal Management and Industrial Relation Prentice - Hall
2	William B. Werther : Personnel Management and Human Resources Mc Graw Hill & Keith Davis Book. Co.
3	Essential of management by Koontz H and Weitrich
4	Marketing Management-Planning Implementation and Control, Ramaswamy. V S & Namakumari. S, Macmillan Business Books, New Delhi, 2002
5	Organisational behaviour by K. A. Ashwatthapa

Semester	:	IV
Title of the Subject / course	:	Computerized Accounting
Course Code	:	MMS/ELE/529
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Objectives (CO): -

CO1: To make students understand the concept of Computerized Accounting System.
CO2: To impart the knowledge of Tally Accounting Software and Computerized Accounting to the Students.
CO3: To train students in developing financial models.

Learning Outcomes (LO): -

LO1: Equip students in use of accounting software for general accounting requirements
LO2: To maintain financial statements for a business entity.

Course Outline: -

Unit 1: Introduction to Computer Accounting Information System (CAIS): Introduction to Computers (Elements, Capabilities, Limitations of Computer System), Operating Software, Utility Software and Application Software, Introduction to Accounting Information System (AIS) as a part of Management Information System.

Unit 2: Introduction to Tally Prime Software of Computerized Accounting, History of various version of tally, Distinction between Manual Accounting and Computerized Accounting, Meaning & Distinction between ERP and SAP, features of tally prime, Company creation in tally, Alter & Shut company.

Unit 3: Creation of masters in tally prime: **Accounting Masters**: Chart of accounts, Creation of ledger: Single & multi, display & alter ledger. Accounting vouchers in tally prime.
Inventory Masters: Creation of stock group, stock category, stock item, unit, creation godown; various types of Inventory Vouchers in tally prime. **Statutory Masters:** GST registration, GST classification.

Unit 4: Banking utilities: Cheque printing, Bank reconciliation; Feature of Accounting, Inventory, Taxation, **Reports**: Day book, Balance sheet, Profit & Loss A/c, Dashboard.

Unit 5: Company Data: Back up, Restore, Import & Export data.

Text books:

1	Learn Tally Prime With GST Book by Gaurav Agrawal.
2	Self-Practicing Materials on Case Studies in Accounting Sequences encompassing Tally Prime by Kousik Dey.

Reference books:

1	Official Guide to Financial Accounting using TallyPrime: Managing Your Business Just Got Simpler (English Edition) by Tally Education Private Limited.
2	Learn TallyPrime with practical examples by Bimlendu Shekhar.

Semester	:	**IV**
Title of the Subject / course	:	**Enterprise Resource Planning (ERP)**
Course Code	:	**MMS/ELE/530**
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: - This course covers concepts in enterprise resource planning (ERP). The main focus of this course is to show how ERP systems integrate business processes across functional areas and support business management and performance analysis. An ERP system integrates the flow of data and documents from one functional area to the next throughout the process. This course will also examine how ERP systems evolved from early computer systems and manufacturing, the implications of legislation

Prerequisites: Fundamentals of Business Process, Software Project Management

Course Objectives (CO): -

1. Understand the Fundamental Concepts of ERP
2. Explore ERP Technologies and Tools
3. Analyse ERP Modules and Their Functions
4. Master ERP Implementation Strategies
5. Evaluate ERP Market Dynamics

Learning Outcomes (LO): -

1.Business processes common to most businesses--order processing, inventory management, procurement, etc.
2.Master data common to most businesses--customer, vendor, inventory, etc.
3.Process modelling--creating diagrams to depict the sequence of tasks completed in a business process.
4.How a business process often spans different functional areas of the business: accounting, marketing, material management, etc.
5.How enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
6.The issues involved in implementing an ERP system

Course Outline: -

Unit 1: Introduction to ERP: Overview of ERP, MRP, MRP-II and evaluation of ERP, integrated management systems, reasons for the growth of ERP, business modelling, integrated data model, foundations of IS in business, obstacles of applying IT, ERP market

Unit 2: ERP & Related Technologies: Business Process Reengineering (BPR), Data Warehousing and Data Mining, OLAP, Product Life Cycle Management, Supply Chain management, CRM

Unit 3: ERP Modules: Finance, Accounting system, manufacturing and production system, sales and distribution system, human resource system, plant maintenance system, material management system, quality management system, ERP system options and selection, ERP proposal evaluation.

Unit 4: ERP Implementation: Implementation Challenges, ERP Implementation Strategies, ERP Implementation Life Cycle, Implementation Methodologies, ERP Projects Teams, Vendors and Consultants, Dealing with employee resistance, Training and Education, data migration, Project Management and monitoring, Post Implementation Activities

Unit 5: The ERP Market: ERP Market Place and Market Place Dynamics, Market Overview, The Changing ERP Market, SAP AG, Oracle, Peoplesoft, JD Edwards. Future Directives in ERP

Text books:

1	ERP A Managerial Prospective - S Sadagopa
2	ERP Demystified - Alexis Leon
3	Enterprise-wide Resource Planning - Rahul V. Altekar

Reference books:

1	Enterprise Resource Planning Concepts and Practice - Vinod Kumar Garg and Venkitakrishnan N K
2	Concepts in Enterprise Resource Planning - Joseph A Brady, Ellen F Monk, Bret Wagner

Semester	:	IV
Title of the Subject / course	:	R-Programming
Course Code	:	MMS/ELE/531
Credits	:	4
Marks	:	Marks: 100 (UA: 60 + IA: 40)

Course Description: - R Programming is a powerful tool for statistical computing and data analysis, widely used in academia, research, and industry. This course introduces fundamental concepts of R, including data manipulation, visualization, and statistical modeling. Through hands-on exercises, learners will develop skills to analyze and interpret data effectively. Ideal for beginners or those looking to enhance their data science expertise.

Prerequisites:

Basic knowledge of programming languages like C, C++ and Statistics.

Course Objectives (CO): -

The objective of this course is to provide learners with a comprehensive understanding of R programming for statistical analysis, data visualization, and data science applications. Students will develop the skill to manipulate, analyse and visualize data effectively using R.

Learning Outcomes (LO): -

1. Understand the fundamentals of R programming, including syntax, data types and basic functions.
2. Perform data manipulation and cleaning.
3. Create effective and insightful visualizations.
4. Conduct statistical analysis and interpret results with R.
5. Develop reproducible workflows with R. Utilize R for real-world data science tasks, including machine learning and data modeling

Course Outline: -

Unit 1: Overview of R and its Advantages: Installing R and R-Studio, Navigating the R-Studio interface - console, script editor, environment, plots and help, R packages and CRAN repository.

Unit 2: Basic of R programming: Basic R syntax, Data types - numeric, character, logical, factor and date/time and operations - arithmetic, relational, and logical, R syntax and expressions.

Unit 3: Control statements: if statement, if else statement, if else() function, switch() function, while loop, for loop, break and next statement.

Unit 4: Data Structures: Vector - creating vectors, accessing elements of vectors, operations on vectors, vector arithmetic, **Matrix** - creating matrix, accessing elements of matrix, operation on matrices, **List** - creating list, manipulating lists elements, merging lists, converting list to vectors, **Data frames** - creating data frames, operations on data frames, accessing data frames.

Unit 5: Functions in R : formal and actual arguments, named arguments, global and local variables, recursive functions. Data visualization in R

Text books :

1	R Programming - An Introduction with Examples : To know more about R by Dr Shylaja S
2	THE BOOK OF R THE BOOK OF A FIRST COURSE IN R PROGRAMMING AND STATISTICS by TILMAN M. DAVIES T
3	R Programming for Beginners by Sandip Rakshit
4	FUNDAMENTALS OF R PROGRAMMING by Balwinder Kaur, Dr. D. Sathiya, et al.

Reference books:

1	R Programming An Approach to Data Analytics by G Sudhamathy
2	Hands on Programming With R: Write Your Own Functions and Simulations by Garrett Grolemund

Semester	:	IV
Title of the Subject / course	:	Major Project
Course Code	:	MMS/RP/532
Credits	:	06
Marks	:	Marks: 150 (UA: 150)

Course Description: A project is an assignment that the student needs to complete at the end of semester IV to strengthen the understanding of fundamentals through effective application of the subjects learnt.

Course Outcomes (CO): -

CO1: Create working practical project using tools and techniques learnt entire semester
CO2: Develop an application using the languages and concepts learnt in the theory and practical.

Learning Outcomes (LO):-

LO1: Student will come to know about practical applicability of the subject learnt

Guidelines for Major Project:

1. The student may take up the Major project in the 4th semester based on the courses , languages learnt in all semester.
2. The student may take up the project individually.
3. Selected project/module must have relevant scope as per the marks assigned and must be carried out in the Institute.
4. Internal Project guide should monitor and evaluate the progress of the project on individual basis through handwritten workbook (Project Diary) maintained by students containing various project milestones with learnings and remarks from internal guide for concurrent evaluation.
5. The Project Synopsis should contain an Introduction to Project clearly stating the project scope and usefulness.
6. Students are expected to show working demo of the project during final evaluation.
7. Students are expected to submit the soft copy and Hard copy of Major project report as a part of final submission.
8. The project will carry 150 mark and evaluation is done as per official guidelines

PROJECT GUIDE LINES (STRUCTURE)
1. INTRODUCTION:
1. Introduction 1.1. Existing System 1.2. Need for the New System 1.3. Objective of the New System 1.4. Problem Definition 1.5. Core Components 1.6. Project Profile 1.7. Assumptions and Constraints 1.8. Advantages and Limitations of the Proposed System
2. Requirement Determination & Analysis 2.1. Requirement Determination 2.2. Targeted Users
3. METHODOLOGY OF THE STUDY:
a. Source of collection of primary data
b. Source of collection of secondary data
4. System Design 4.1. Use Case Diagram 4.2. Class Diagram 4.3. Interaction Diagram 4.4. Activity Diagram 4.5. Data Dictionary
4. Development 4.1. Coding Standards 4.2. Screen Shots
5. FINDING
6 LIMITATIONS IN DATA COLLECTION
7. SUMMARY & CONCLUSION
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