

B.C.A. Computer Applications (CBCS)

THIRUVALLUVARUNIVERSITY

BACHELOR OF COMPUTER APPLICATIONS DEGREE COURSE

CBCS PATTERN

II YEAR

S. No.	Part	Study Components		Ins. Hrs / week	Credit	Title of the Paper	Maximum Marks		
		Course Title							
SEMESTER III									
1.	III	Core Theory	Paper-3	5	4	Programming in JAVA	25	75	100
2.	III	Core Theory	Paper-4	4	4	E-Commerce	25	75	100
3.	III	Core Theory	Paper-5	5	4	Operations Research	25	75	100
4.	III	Core Practical	Practical-3	4	3	Programming in JAVA Lab	25	75	100
5.	III	ALLIED-2	Paper-3	7	3	Financial Accounting-I	25	75	100
6.	IV	Skill based Subject I	Paper-1	3	2	Web Technology	25	75	100
7.	IV	Non-Major Elective	Paper-1	2	2	Management Concepts	25	75	100
		Sem. Total		30			175	525	700
SEMESTER IV							CIA	Uni. Exam	Total
8.	III	Core Theory	Paper-6	5	4	Relational Database Management Systems	25	75	100
9.	III	Core Theory	Paper-7	4	4	Enterprise Resource Planning	25	75	100
10.	III	Core Theory	Paper-8	5	4	Wireless Data Communications	25	75	100
11.	III	Core Practical	Practical-4	4	3	RDBMS Lab	25	75	100
12.	III	ALLIED-2	Paper-4	7	5	Financial Accounting-II	25	75	100
13.	IV	Skill based Subject -II	Paper-2	3	2	Internet Of Things	25	75	100
14.	IV	Non-Major Elective	Paper-2	2	2	Training and Development	25	75	100
		Sem. Total		30	24		175	525	700

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Part	Subject	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages	2	4	16	100	400
Part II	Communicative English & English	2	4	16	100	400
Part III	Allied (Odd Semester)	2	3	6	100	200
	Allied (Even Semester)	2	5	10	100	200
	Electives	3	3	9	100	300
	Core	13	(3-5)	50	100	1300
	Core practical	8	(2-3)	20	100	800
	Professional English	2	3	6	100	200
	Compulsory Project (Group/Individual Project)	1	5	5	100	100
Part IV	Environmental Science	1	2	2	100	100
	Soft skill	1	1	1	100	100
	Value Education	1	2	2	100	100
	Lang. & Others /NME	2	2	4	100	200
	Skill Based	4	2	8	100	400
Part V	Extension Activities	1	1	1	100	100
	Total	45		140		4500

III SEMESTER

CORE PAPER-3

PROGRAMMING IN JAVA

COURSE OBJECTIVES:

- Knowing about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes
- Secured, well-suited for internet programming using applets and GUI-based

UNIT I

Declarations and Access Control: Identifiers and Keywords: Oracle's Java Code Conventions. Define Classes: Import Statements and the Java API - Static Import Statements. Use Interfaces: Declaring an Interface- Declaring Interface Constants. Declare Class Members: Access Modifiers - Non access Member Modifiers - Constructor Declarations - Variable Declarations. Declare and Use enums: Declaring enums. Object Orientation: Encapsulation - Inheritance and Polymorphism- Polymorphism - Overriding / Overloading: Overridden Methods -Overloaded Methods.

UNIT II

Object Orientation: Casting - Implementing an Interface - Legal Return Types: Return Type Declarations - Returning a Value. Constructors and Instantiation: Overloaded Constructors - Initialization Blocks. Statics: Static Variables and Methods. Assignments: Stack and Heap - Literals, Assignments, and Variables: Literal Values for All Primitive Types. Scope - Variable Initialization - Passing Variables into Methods: Passing Object Reference Variables - Passing Primitive Variables. Garbage Collection. Operators: Java Operators - Assignment Operators - Relational Operators - instanceof Comparison - Arithmetic Operators - Conditional Operator - Logical Operators.

UNIT III

Working with Strings, Arrays, and Array Lists: Using String and StringBuilder: The String Class - The StringBuilder Class - Important Methods in the StringBuilder Class. Using Arrays: Declaring an Array -Constructing an Array - Initializing an Array. Using ArrayList:ArrayList Methods in Action - Important Methods in the ArrayList Class. Flow Control and Exceptions: Using if and switch Statements -Creating Loops Constructs - Handling Exceptions - Catching an Exception Using try and catch - Using finally. String Processing, Data Formatting Resource Bundles: String, StringBuilder, and StringBuffer -Dates, Numbers, Currencies, and Locales.

UNIT IV

I/O and NIO: File Navigation and I/O: Creating Files Using the File Class - Using FileWriter and FileReader. File and Directory Attributes -DirectoryStream - Serialization. Generics and Collections: toString(), hashCode(), and equals(): The toString() Method - Generic Types -Generic Methods - Generic Declarations. Inner Classes: Method –

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Local. Inner Classes - Static Nested Classes - Threads: Defining, Instantiating, and Starting Threads - Thread States and Transitions - Synchronizing Code, Thread Problems - Thread Interaction. Concurrency: Concurrency with the java.util.concurrent Package - Apply Atomic Variables and Locks - Use java.util.concurrent Collections - Use Executors and ThreadPools.

UNIT V

Applets: Applet fundamentals - Applet class - Applet life cycle - Steps for developing an applet program - Passing values through parameters - Graphics in an applet - Event-handling. GUI Applications - Part 1: Graphical user interface - Creating windows - Dialog boxes - Layout managers - AWT component classes - Swing component classes. GUI Applications - Part 2: Event handling - Other AWT components - AWT graphics classes - Other swing controls.

TEXT BOOK(S):

1. Kathy Sierra, Bert Bates — OCA/OCP Java SE 7 Programmer I & II Study Guide, Oracle Press. (Unit I,II,III,IV).
2. Sagayaraj, Denis, Karthik and Gajalakshmi, 2018, Java Programming - For Core and Advanced Learners, University Press (India) Private Limited, Hyderabad.(Unit V).

REFERENCE BOOKS:

1. Hebert Schild, 2002, The Complete Reference Java2, [Fifth Edition]. Tata McGraw-Hill, New Delhi.
2. John Hubbard, R.2004. Programming with Java. [Second Edition]. Tata McGraw-Hill,New Delhi.
3. Debasish Jana. 2005. Java and Object-Oriented Programming Paradigm, [Second Printing]. Prentice-Hall of India, New Delhi.
4. Sagayaraj, Denis, Karthik and Gajalakshmi 2018, Java Programming for core and advanced Learners, University Press India Pvt. Ltd., Hyderabad.

Course Outcomes:

- Students are able to know about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes
- Students are able to Secured, well-suited for internet programming using applets and GUI-based

CORE PAPER-4

E-COMMERCE

Objectives:

- ✓ To provide the knowledge about commerce through electronic medium & information system.
- ✓ To understand the concepts of security.
- ✓ To understand the basic knowledge of E- Payments.
- ✓ To understand the concepts of EDI.
- ✓ To understand the concepts of Trading relationships.

UNIT I

15 Hours

Electronic Commerce Framework, Traditional Vs. Electronic Business Application, The Anatomy of E-Commerce Applications. Network infrastructure for E-Commerce – Components of the I-way – Global Information Distribution Networks – Public policy issues shaping the I – way. Network Access Equipment

UNIT II

15 Hours

The internet as a Network Infrastructure, Network Security and Firewalls – Client Server Network Security – Firewalls and Network Security – Data and Message Security – Encrypted Documents and Electronic Mail.

UNIT III

15 Hours

Electronic Commerce and World Wide Web, Consumer Oriented E-Commerce, Electronic Payment Systems

UNIT IV

15 Hours

Electronic Data Interchange (EDI), EDI application in business, EDI and E- commerce – EDI implementation. Intra-organizational Electronic Commerce - Supply Chain Management.

UNIT V

15 Hours

Corporate Digital Library – Advertising and marketing on the Internet – E-Commerce Catalogs or Directories- On demand Education and Digital Copyright – Applets, Browsers & Software Agents.

TEXTBOOK:

1. Frontiers of Electronic Commerce, R. Kalakota and Andrew. B. Whinston, Pearson , 11th Edition , 2011.

REFERENCES:

1. Understanding Electronic Commerce, DaidKosiur, Microsoft Press, 1997.
2. From EDI to Electronic Commerce, Soka, McGraw Hill, 1995.
3. Electronic Commerce Management, Saily Chan, John Wiley, 1998.

Course Outcomes:

- The Student will be able to understand the concepts of E-commerce and its different types and describe the network infrastructure for E-commerce.
- The Student will be able to understand the concepts of networks and fundamental of security concepts, security services to counter them, understand the fundamental properties of cryptography Techniques.
- The Student will be able to understand the concepts of electronic payment systems, online security and understand the fundamentals of create a E-commerce web site.
- The Student will be able to understand the concepts of the basic fundamentals of electronic document interchange EDI, supply chain management process.
- The Student will be able to understand the concepts of internet trading relationships including inter organization and intra-organizations.

CORE PAPER-5

OPERATION RESEARCH

Objectives:

- ✓ To understand the concepts of Linear Programming.
- ✓ To understand the concepts of Transportation, Assignment problem.
- ✓ To understand the concepts of sequence problem.
- ✓ To understand the concepts of PERT and CPM.
- ✓ To understand the concepts of Cost Flow Problem.

UNIT- I:

9 Hours

LINEAR MODELS: Basics of OR & Decision making - Role of computers in OR, Linear Programming Problem – Formulation, Graphical solution of two variables Canonical & standard form of LPP, Simplex method, Charne’s method of penalties.

UNIT- II:

9 Hours

TRANSPORTATION AND ASSIGNMENT PROBLEMS: Transportation algorithm - Degeneracy algorithm- Unbalanced Transportation problem Unbalanced assignment algorithm.

UNIT – III:

9 Hours

SEQUENCING PROBLEM: Processing of n jobs through two machines -Processing of n jobs through three machines- Processing of n jobs through m machines.

UNIT- IV:

9 Hours

PERT & CPM: Network - Fulkerson’s rule- Measure of activity- PERT computation- CPM computation.

UNIT –V:

9 Hours

NETWORK MODELS: Network definition- Minimal spanning tree problem- Shortest route problem- Maximal flow problem- Minimal cost capacitated flow problem.

TEXT BOOK

1. Hamdy A. Taha, Operations Research An Introduction, Eighth Edition, Pearson Education, Inc., 2008
2. Kantiswaroop, Gupta P.K and Manmohan, Operations Research, Sultan Chand & Sons, New Delhi, 2008

REFERENCES

1. Prem Kumar Gupta and D.S. Hira, Operations Research, S. Chand and Co., Ltd. New Delhi, 2008.
2. Gupta R. K., Linear Programming, Krishna Prakashan Media (P) Ltd. , 2009.

E - REFERENCES

1. Lecture Series on Fundamentals of Operations Research by Prof. G. Srinivasan, Department of Management Studies, IIT Madras. For more details on NPTEL visit <http://nptel.iitm.ac.in>

Course Outcomes:

- The Student will be able to understand the concepts of optimization and to formulate and Solve Linear Programming problems.
- The Student will be able to understand the concepts of Transportation problem and Assignment problem.
- The Student will be able to understand the concepts of sequencing problem.
- The Student will be able to understand the concepts of PERT-CPM and their applications in product planning control.
- The Student will be able to understand the concepts of Solve the Minimal Spanning Tree Problem, Shortest Route Problem, Maximal Flow Problem and Minimal Cost Capacitated Flow Problem.

CORE PRACTICAL - Practical-3

PROGRAMMING IN JAVA LAB

List of Practical's

1. Implementation of Classes and Objects
2. Implementation of Inheritance and Polymorphism
3. Implementation of Interface and Package concepts
4. Implementation of Flow, Border ,Grid Layouts
5. Implementation of Tic-Tac Toe Application Using Applets
6. Implementation of Frames, Menus, Dialog
7. Implementation of Swing concepts
8. Implementation of Exception Handling
9. Implementation of Multi Threading
10. Implementation of I/O Streams
11. Implementation of Java Networking concepts
12. Implementation of Java Servlets (Connecting Database)
13. Implementation of RMI
14. Implementation of Java Beans

ALLIED - 2

PAPER - 3

FINANCIAL ACCOUNTING– I

COURSE OBJECTIVES:

- The objective of this paper is to help the students to acquire conceptual knowledge of accounting.

COURSE OUTCOMES:

On the successful completion of the course, the student will be able

CO NUMBER

CO STATEMENT

CO1	To introduce the basic concepts and conventions to the students, this would help in development of accounting knowledge.
CO2	To understand the concept of Double entry system this helps in preparation of various books of accounts.
CO3	To develop the capability of students to prepare the Final Accounts of a Small Business Concern.
CO4	To introduce the concept of Single entry system of Accounting which helps them to prepare the accounts from incomplete records.
CO5	To enhance the Accounting Knowledge by introducing the practical uses of Average Due Date and Bank Reconciliation Statement.

Unit-I

INTRODUCTION TO ACCOUNTING

Meaning- Definition- Functions- Objectives- Users of Accounting Information- Accounting Concepts and Conventions – Advantages and Limitations of Accounting.

Unit-II

DOUBLE ENTRY SYSTEM OF ACCOUNTING

Meaning and concepts - Golden Accounting Rules- Journal Entries- Ledger- Trail Balance – Rectification of Errors (Simple Problems).

Unit-III

FINAL ACCOUNTS

Preparation of Trading Account, Profit and Loss Account and Balance Sheet- Adjustment Entries (Simple Problems).

Unit-IV

SINGLE ENTRY SYSTEM

Meaning - Features - Advantages - Limitations - Methods- Net Worth Method – Conversion Method (Simple Problems).

Unit-V

AVERAGE DUE DATE AND BANK RECONCILIATION STATEMENT

Average Due Date - Meaning -Uses – Problems - Bank Reconciliation Statement-Meaning- Reasons for Preparation- Procedures and Preparation of Bank Reconciliation statement (Simple Problems).

DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%

TEXT BOOK

S.No	Author	Title	Publisher	Year of Publication
1	T.S.Reddy and Murthy	Financial Accounting	Margham Publications	2018

REFERENCE BOOKS

S.No	Author	Title	Publisher	Year of Publication
1	M.C. Shukla and T.S. Grewal&co	Advanced Accounts	S. Chand & Co	2016
2	R.L. Gupta	Financial Accounting	Sultan chand	2014
3	S.P. Jain &K.L Narang,	Financial Accounting	Kalyani Publication	2017
4	R.S.N Pillai&V.Bagavathi	Fundamental of Advanced Accounting, Volume – I	S. Chand & Co	2013

SKILL BASED SUBJECT

PAPER-1

WEB TECHNOLOGY

Objective:

- ✓ This course introduces the concepts of HTML.ASP, VB Script,.
- ✓ This course introduces the concepts of control statements and looping statements in Java script.
- ✓ This course introduces the concepts of Java Script Cookies.
- ✓ This course introduces the concepts of ASP.NET
- ✓ This course introduces the concepts of OLEDB connection.

Unit I:

8 Hours

Introduction to VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants - VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions –date functions – string functions –other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object

Unit-II:

8 Hours

Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type –Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .

Unit III:

8 Hours

Javascript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.

Unit IV:

8 Hours

ASP.NET Language Structure – Page Structure – Page event , Properties & Compiler Directives . HTML server controls – Anchor, Tables, Forms, Files . Basic Web server Controls – Label, Text box, Button, Image Links, Check & radio Button, Hyperlink,

Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.

Unit V:

8 Hours

Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives , error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates.

TEXT BOOKS:

1. I.Bayross, 2000, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI, BPB Publications.
2. A.Russell Jones, Mastering Active Server Pages 3, BPB Publications.

REFERENCE BOOKS:

1. HathleenKalata, Internet Programming with VBScript and JavaScript, Thomson Learning
2. Mike McGrath, XML Harness the Power of XML in easy steps, Dreamtech Publications
3. T.A. Powell, 2002, Complete Reference HTML , TMH.
4. J.Jaworski, 1999, Mastering Javascript, BPB Publications.
5. Powell, Thomas; Schneider, Fritz, JavaScript: The Complete Reference, 2nd edition 2004, TMH

Course Outcomes:

- The Student will be able to understand the concepts of HTML.
- The Student will be able to understand the concepts of java scripts.
- The Student will be able to understand the concepts of user defined functions.
- The Student will be able to understand the concepts of Active Server Page.
- The Student will be able to understand the concepts of – OLEDB connection class.

**NON-MAJOR ELECTIVE
PAPER-1
MANAGEMENT CONCEPTS**

Course Objectives

1. To understand the concepts related to Business.
2. To learn the roles, skills and functions of management.
3. To learn the application of the knowledge in solving organizational problems.
4. To develop optimal managerial skills in planning and in taking decisions.
5. To acquire knowledge in Communication, Leadership, Controlling, Motivation and Delegation

UNIT - I

Management - meaning and Definition - Importance - nature - scope of management process - Role and Functions of a Manager - levels of management - Taylor's contribution - Fayol's contribution - Elton Mayo's contribution - Systems approach - Contingency approach-

UNIT - II

Planning - meaning and definition of planning - Nature of planning- Purpose of planning - Steps in planning process - Types of plans - Merits and Demerits of Planning - Objectives - nature of objectives - importance of objectives - functions of objectives - MBO - meaning and definition - nature of MBO - process of MBO - Advantages and disadvantages of MBO.

UNIT - III

Organising - meaning and definition of organizing - nature and Purpose of organizing - organizational structure - types of organisation structure - Line and Staff Organisation - Committee Organisation - Departmentation - Span of Control - meaning and definition of span of control - Delegation of Authority - difference between authority and power - types of authority - uses of authority - Centralisation and Decentralisation of Authority - elements of responsibility - differences between authority and responsibility.

UNIT - IV

Directing - nature of directing - purpose of directing - Leadership - nature of leadership - importance of leadership - functions of leadership - qualities of effective leaders - styles of leadership - Motivation - nature of motivation - importance of motivation - theories of motivation - Communication - Process of Communication - principles of effective communication - Barriers of Communication.

UNIT - V

Controlling - meaning and definition of controlling - nature of controlling - objectives of controlling - importance of controlling - Control process - technique of controlling - Co-ordination - Need of coordination - Principles of coordination - technique of coordination - requisites for excellent coordination - Approaches to achieve effective Co-ordination

TEXT BOOKS

Unit 1

1. Sundar - Principles of Management - Vijay Nicole Private Limited
2. Dr.C.D. Balaji -Principles of Management -Margham Publications
3. J.R. Beulah Bharathi, & C. Arunachalam, Principles of Management, Thakur Publications Pvt Ltd

Unit 2

1. Sundar - Principles of Management -Vijay Nicole Private Limited
2. Dr.C.D. Balaji -Principles of Management -Margham Publications
3. J.R. Beulah Bharathi, & C. Arunachalam, Principles of Management, Thakur Publications Pvt Ltd

Unit 3

1. Sundar - Principles of Management -Vijay Nicole Private Limited
2. Dr.C.D. Balaji -Principles of Management -Margham Publications
3. J.R. Beulah Bharathi, & C. Arunachalam , Principles of Management, Thakur Publications Pvt Ltd

Unit 4

1. Sundar - Principles of Management -Vijay Nicole Private Limited
2. Dr.C.D. Balaji -Principles of Management -Margham Publications
3. J.R. Beulah Bharathi, & C. Arunachalam , Principles of Management, Thakur Publications Pvt Ltd

Unit 5

1. Sundar - Principles of Management -Vijay Nicole Private Limited
2. Dr.C.D. Balaji -Principles of Management -Margham Publications
3. J.R. Beulah Bharathi, & C. Arunachalam , Principles of Management, Thakur Publications Pvt Ltd

Reference Items: Books and Journals

1. L.M. Prasad - Principles and Practice of Management - Margham Publication.
2. R.N. Gupta - Principles of Management - S.Chand & Co.

E-Materials

- www.managementstudyguide.com
- www.managementconcepts.com
- managementtheip.org
- [www.edx.org › learn › management](http://www.edx.org/learn/management)
- https://gurukpo.com/Content/MBA/Principles_and_Practices_of_Management.pdf
- https://www.tutorialspoint.com/management_principles/management_principles_tutorial.pdf

Course Outcome

1. After studied Unit 1, the student understand the concepts related to Business.
2. After studied Unit 2, the student learns the roles, skills and functions of management.
3. After studied Unit 3, the student analyze effective application of the knowledge to solve organizational problems.

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4. After studied Unit 4, the student develop optimal managerial skills in planning and in taking decisions.
5. After studied Unit 5, the student acquires in depth knowledge in Communication, Leadership, Controlling, Motivation and Delegation

**SEMESTER IV
CORE PAPER-6**

RELATIONAL DATABASE MANAGEMENT SYSTEMS

Objective:

- ✓ The students are able to understand database concepts and database management system software and have a high-level understanding of major DBMS components and their function.
- ✓ The students are able to understand the E R model and relational model.
- ✓ The students are able to be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- ✓ The students are able to Understand Functional Dependency and Functional Decomposition.
- ✓ The students are able to understand the architecture of database management system and also understand the various different architecture such as server system architecture, parallel systems and distributed database systems.

UNIT- I : DATABASE ARCHITECTURE AND ER DIAGRAM

12 Hours

Database system applications - Purpose of database systems - View of data- Database languages - Database architecture - Database users and administrators - History of database systems-Entity relationship modeling: entity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, sub classes; super classes, inheritance, specialization and generalization

UNIT- II: RELATIONAL DATA MODEL

12 Hours

Relational model concepts, Relational constraints, Relational Languages : Relational Algebra, The Tuple Relational Calculus - The Domain Relational Calculus - SQL: Basic Structure-Set Operations- Aggregate Functions-Null Value-Nested Sub Queries- Views Complex Queries Modification Of Database-Joined Relations-DDL-Embedded SQL-Dynamic SQL-Other SQL Functions- -Integrity and Security.

UNIT – III: DATA NORMALIZATION

12 Hours

Pitfalls in relational database design – Decomposition – Functional dependencies – Normalization – First normal form – Second normal form – Third normal form – Boyce-codd normal form – Fourth normal form – Fifth normal form

UNIT- IV: STORAGE AND FILE ORGANIZATION

12 Hours

Disks - RAID -Tertiary storage - Storage Access -File Organization – organization of files - Data Dictionary storage

UNIT- V: QUERY PROCESSING AND TRANSACTION MANAGEMENT

12 Hours

Query Processing - Transaction Concept - Concurrency Control –Locks based protocolDeadlock Handling -Recovery Systems

TEXT BOOK:

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, Database Systems Concepts, Sixth Edition, McGraw Hill, 2010.
2. Raghu Ramakrishnan and Johannes Gehrke, Database management systems, Third Edition,2002

REFERENCES

1. Bipin Desai, An Introduction to database systems, Galgotia Publications, 2010.
2. RamezElamassri, Shankant B-Navathe, Fundamentals of Database Systems, Pearson, 7th Edition, 2015

E - REFERENCES

1. NPTEL, Introduction to database design, Dr P Sreenivasa Kumar Professor CS&E, Department, IIT, Madras
2. NPTEL, Indexing and Searching TechniquesinDatabasesDr. ArnabBhattacharya,IIT Kanpur

Course Outcomes:

- Describe the database architecture and its applications Sketch the ER diagram for real world applications Uses various ER diagram for a similar concepts from various sources.
- Discuss about the relational algebra and calculus Construct various queries in SQL and PL/SQL Compiles various queries in SQL, Relational Calculus and Algebra.

- Describe the various normalization forms Apply the normalization concepts for a table of data Practices a table and implement the normalization concepts.
- Explain the storage and accessing of data.
- Illustrate the query processing in database management. Define the concurrency control and deadlock concept

CORE PAPER - 7

ENTERPRISE RESOURCE PLANNING

Objective:

- ✓ With the basic concepts of ERP systems the students are able to understand the business process, business function and differences between business process and business functions. They also came to know the key differences between raw data and raw materials.
- ✓ The students are able to understand the exchange of information between AF, SCM, HR and MS. And they also learn about CRM, budget and preparing balance sheets.
- ✓ The students are able to understand the key factors related to marketing and sales in the companies, and the differences among (Material Requirement Planning) MRP, MRP II, and ERP systems.
- ✓ They also understand the inter relationship between the other functional areas like SCM, AF, HR and customer. Concepts and techniques.
- ✓ The students are able to understand the power of human resources such as managing man power, job skills preparing paybills and taking legal actions to the compliances and hiring needs.

UNIT - I : INTRODUCTION

8 Hours

ERP: An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, SCM

UNIT- II: ERP IMPLEMENTATION

8 Hours

ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contract with Vendors.

UNIT- III: THE BUSINESS MODULES

8 Hours

Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution

UNIT- IV: ERP PACKAGES

8 Hours

ERP Market Place, SAP AG, PeopleSoft, Baan, JD Edwards, Oracle, QAD, SSA

UNIT- V: ERP –PRESENT AND FUTURE

8 Hours

Turbo Charge the ERP System, EIA, ERP and e-Commerce, ERP and Internet, Future Directions.

TEXT BOOK:

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000

REFERENCES

1. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, ThompsonCourseTechnology,USA,2001.

2. Vinod Kumar Garg and Venkatakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003

E- REFERENCES

1. ERP, Prof. P. K. Biswas, Dept. of Electronics and Electrical Communication Engg., IIT, Kharagpur

Course Outcomes:

- Understanding the functionalities of Enterprise resource planning
- Understanding Characterize the ERP implementation procedures
- Understanding the elements of ERP
- Understanding the available ERP packages
- Understanding the models of ERP with other related technologies

CORE PAPER - 8

WIRELESS DATA COMMUNICATION

Objectives:

- ✓ This course introduces the concepts and theories of networking
- ✓ To apply them to various situations, classifying networks, analyzing performance and implementing new technologies.
- ✓ To implement the various new wireless technologies.
- ✓ To implement the various TCP/IP protocols.
- ✓ To implement the various security threads.

UNIT-1 BASIC CONCEPTS OF OSI LAYERS

9 Hours

Data Communication – Networks – Protocol and Standards – Line Configuration – Topology – Transmission Modes – Categories of Networks – Internetworks- OSI Models – Functions of OSI Layers.

UNIT-II SIGNALS AND TRANSMISSION MEDIA

9 Hours

Analog and digital – Periodic and Non Periodic signals – Analog Signals – Time And Frequency Domain - Composite Signals- Digital signals – Guided Media – UnGuided Media – Transmission Impairment – Performance.

UNIT-III ERROR DETECTION, CORRECTION AND DATA LINK CONTROL

9 Hours

Type of errors –Detection-Vertical Redundancy Check (VRC) -Longitudinal Redundancy Check (LRC) Cyclic Redundancy Check (CRC) – check sum – Error Corrections – Flow Control – Error Control.)**SWITCHING & NETWORK DEVICES:** Circuit Switching-Packet Switching-Message Switching Repeaters – Bridges – Routers – Gateways-other Devices - Routing Algorithms-Distance Vectors Routing-Link State Routing.

UNIT- IV: WIRELESS NETWORKS

9 Hours

Wireless LAN: Advantages and Disadvantages-Infrared Vs Radio Transmission – Infrastructure Networks- Ad hoc Networks – Bluetooth- Wireless ATM: Working Group Services- Reference Model – Functions – Radio Access Layer – Handover- Handover reference model- Requirements and Types.

UNIT-V TCP/IP PROTOCOL SUITE: PART I, PROTOCOLS & NETWORK SECURITY

9 Hours

Overview Of TCP/IP – Network Layer – Addressing – Subnetting – Other Protocols In The Network Layer – Transport Layer – Client/Server Model – Bootstrap Protocol and DHCP - Domain Name System (DNS) – Tel Net –File Transmission Protocol (FTP) – Simple Mail Transfer Protocol (SMTP) – SNMP Protocol – Hyper Text Transmission Protocol (HTTP) – World Wide Web (WWW) –Four Aspects of Security – Privacy – Digital Signature – PGP – Access Authorization.

Text Book:

1. Data Communication and Networking 2nd Edition Behrouz A. Forouzan, McGraw Hill Education 2014.
2. Stojmenovic and Cacute, Handbook of Wireless Networks and Mobile Computing, Wiley, 2002, ISBN 0471419028.

Reference Books:

1. Data and Communication Network, William Stalling PHI 2014.
2. Computer Networks, Andrew S. Tanenbaum, David J. Wetherall, 5th Edition, Prentice Hall. 2010

E REFERENCES

1. <http://nptel.ac.in/video.php?subjectId=117102062>

Course Outcomes:

- To understand the concepts of basic OSI layers.
- To understand the concepts of signals and transmission media.
- To understand the basic concepts of error detection and DLC
- To understand the Characterize of wireless transmission technologies
- To understand the concepts of Security.

Core Practical (Practical-4)

RDBMS LAB

Objectives:

- ✓ To understand the concepts of DDL/DML/DCL/TCL commands.
- ✓ To understand the concepts of Join queries.
- ✓ To understand the concepts of exception handling.
- ✓ To understand the concepts of cursors.
- ✓ To understand the concepts of packages.

LAB EXERCISES:

1. Execute a single line query and group functions.
2. Execute DDL Commands.
3. Execute DML Commands
4. Execute DCL and TCL Commands.
5. Implement the Nested Queries.
6. Implement Join operations in SQL
7. Create views for a particular table
8. Implement Locks for a particular table.
9. Write PL/SQL procedure for an application using exception handling.
10. Write PL/SQL procedure for an application using cursors.
11. Write a PL/SQL procedure for an application using functions
12. Write a PL/SQL procedure for an application using package

REFERENCE BOOK:

1. Abraham Silberschatz, Henry Korth, S.Sudarshan, Database Systems Concepts, Sixth Edition, McGraw Hill, 2010.
2. Raghu Ramakrishnan and Johannes Gehrke, Database management systems, Third Edition, 2002

Course Outcomes:

- Design and Implement a database schema for a given problem domain.

- Populate and Query a database using SQL, DDL/DML Commands.
- Build well formed in String Date/Aggregate Functions.
- Design and Implement a database query using Joins, Sub-Queries and Set Operations.
- Program in SQL including Objects (Functions, Procedures, Triggers)

ALLIED - 2

PAPER - 4

FINANCIAL ACCOUNTING - II

COURSE OBJECTIVE:

- To develop the skills for recording the various kinds of Business Transactions.

COURSE OUTCOME

On successful completion of this course, the students will be able

CO NUMBER

CO STATEMENT

CO1	To Understand the concept of Branch Accounting and enable the students to prepare Accounts for various types of Branches.
CO2	To enhance the procedure for preparing Departmental Accounts.
CO3	To Develop the skill of the students in preparing Hire Purchase Accounting, both in the books of Hire Purchaser and Hire Vendor.
CO4	To Understand the Accounting procedure for Partnership in cases like Admission, Retirement, Death.
CO5	To Understand the Accounting procedure for Dissolution and Insolvency of a Partner.

Unit – I

BRANCH ACCOUNTS

Branch Accounts – Objectives – Types of Branches – Debtors System (at cost price and Invoice Price) – Independent Branch.

Unit – II

DEPARTMENTAL ACCOUNTS

Departmental Accounts – Objectives – Distinction between Departments and Branches – Allocation of common expenses – Expenses which cannot be allocated – Inter Department transfer at cost price and selling price.

Unit – III

HIRE PURCHASE SYSTEM

Hire Purchase system – Meaning – Journal Entries and Ledger Accounts in the books of Hire Purchaser and Hire Vendor – Default and Repossession -Complete Repossession only.

Unit – IV

PARTNERSHIP ACCOUNTS – I

Partnership Accounts – Admission of Partner– Retirement of Partner – Death of a Partner (Simple Problems)

B.C.A. Computer Applications (CBCS)

Unit – V

PARTNERSHIP ACCOUNTS – II

Dissolution of Partnership Firm - Insolvency of a Partner - Insolvency of all Partners (Garner vs. Murray). (Simple Problems)

DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%

TEXT BOOK

S.No	Author	Title	Publisher	Year of Publication
1	T.S.Reddy and Murthy	Financial Accounting	Margham Publications	2018

REFERENCE BOOKS

S.No	Author	Title	Publisher	Year of Publication
1	M.C. Shukla and T.S. Grewal&co	Advanced Accounts	S. Chand & Co	2016
2	R.L. Gupta	Financial Accounting	Sultan chand	2014
3	S.P. Jain &K.L Narang,	Financial Accounting	Kalyani Publication	2017
4	R.S.N Pillai&V.Bagavathi	Fundamental of Advanced Accounting, Volume – I	S. Chand & Co	2013

SKILL BASED SUBJECT II

PAPER-2

INTERNET OF THINGS

Objectives

- ✓ To learn about the basics of IOT protocols
- ✓ To understand the fundamentals of Internet of Things
- ✓ To build a small low cost embedded system using Raspberry Pi.
- ✓ To apply the concept of Internet of Things in the real world scenario.
- ✓ To understand the real world application concepts.

UNIT I: INTRODUCTION TO IoT

9 Hours

Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG- IoT Platforms Design Methodology.

UNIT II:IoT ARCHITECTURE

9 Hours

M2M high-level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference model - Domain model - information model - functional model - communication model - IoT reference architecture

UNITIII: IoT PROTOCOLS

9 Hours

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – Network layer – 6LowPAN - CoAP– Security.

UNIT IV: BUILDING IoT WITH RASPBERRY PI & ARDUINO

9 Hours

Building IOT with RASPERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices & Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - Raspberry Pi Interfaces -Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

UNIT V: CASE STUDIES AND REAL-WORLD APPLICATIONS

9 Hours

Real world design constraints - Applications - Asset management, Industrial automation, smart grid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT – Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud for IoT - Amazon Web Services for IoT.

TEXT /REFERENCES BOOKS:

1. ArshdeepBahga, Vijay Madiseti, —Internet of Things – A hands-on approach , Universities Press, 2015
2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things , Springer, 2011.
3. Honbo Zhou, —The Internet of Things in the Cloud: A Middleware Perspective , CRC Press, 2012.
4. Jan Hö ller , VlasiosTsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
5. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols , Wiley, 2012

Course Outcomes:

- Analyze various protocols for IoT
- Develop web services to access/control IoT devices.
- Design a portable IoT using Raspberry Pi
- Deploy an IoT application and connect to the cloud.
- Analyze applications of IoT in real time scenario

NON-MAJOR ELECTIVE

PAPER-2

TRAINING AND DEVELOPMENT

Course Objectives

1. To know the in-depth understanding of the role of training.
2. To know the methods of training.
3. To understand the concepts of career development .
4. To know the important concepts used in management development and process and MD programme.
5. To know the institutions offering training programmes in India.

UNIT - I

Concepts of Training and development - Identifying Training Needs - Structure and Functions of Training Department - Evaluation of Training Programme - Role, Responsibilities and Challenges to Training Managers

UNIT - II

Techniques of on the job training - Coaching - Apprenticeship - Job Rotation - Job Instruction Training - Training by Supervisors - Techniques of off the job Training, Lecturers, Conferences, Group Discussion.

UNIT - III

Concept of Career - Career Stages - Career Planning - Need - Importance - Steps in Career Planning - Career Development - Characteristics - Need - Methods of Career Planning and Development.

UNIT - IV

Management Development - Meaning - Definition - Need and importance of Management Development - Characteristics - Levels - Management Development Process and Components of MD Programme.

UNIT - V

Need for Training in India - Government Policy on Training - Training Institutes in India - Management Development Institute.

TEXT BOOKS

Unit-1

Thirumaran D, V.Santhosh - Training and Development, Thakur Publishers Chennai.

Unit-2

Thirumaran D, V.Santhosh - Training and Development, Thakur Publishers Chennai.

Unit-3

Thirumaran D, V.Santhosh - Training and Development, Thakur Publishers Chennai.

Unit-4

Thirumaran D, V.Santhosh - Training and Development, Thakur Publishers Chennai.

Unit-5

Thirumaran D, V.Santhosh - Training and Development, Thakur Publishers Chennai.

Reference Items: Books and Journal

1. Lalitha Balakrishnan & Gowri Ramachandran - Training & Development - Vijay Nicole Imprints Pvt. Ltd.
2. Rao PL: HRD through In-House Training, New Delhi, Vikas Publishing House (P) Ltd.,
3. Reid M.A.: Training Interventions: managing Employee Development London, IPM, 3rd ed., 1992.
4. Aggarwala, D.V., Manpower Planning, Selection, Training and Development, New Delhi, Deep & Deep Publications (P) Ltd., 1999.

E- Materials

- <https://www.mbaskool.com/business-concepts/human-resources-hr-terms/8685-training-and-development.html>
- <https://businessjargons.com/training-and-development.html>
- <https://corporatefinanceinstitute.com/resources/careers/soft-skills/employee-training-and-development/>
- http://ebooks.lpude.in/management/mba/term_4/DMGT518_TRAINING_AND_DEVELOPMENT_SYSTEM.pdf
- <http://www.pondiuni.edu.in/sites/default/files/training-development-260214.pdf>
- <https://www2.le.ac.uk/projects/oer/oers/psychology/oers/Training%20and%20Development%20Introduction%20and%20Overview/Training%20and%20Development%20Introduction%20and%20Overview>

Course Outcomes

1. After studied unit-1, the student will be able to learn the basic concepts of training, identify training needs and functions of training department.
2. After studied unit-2, the student will be able to know the various on-the-job and off the job techniques of training.
3. After studied unit-3, the student will be able to have a clear picture about their career planning and development.
4. After studied unit-4, the student will be able to understand the different techniques of management development programme.
5. After studied unit-5, the student will be able to know the information about the different management training institutes in India.