RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

L T P
4 - 3

RATIONALE

Database and database management systems (DBMS) have become an essential component of everyday life in modern society. This course will acquaint the students with the knowledge of fundamental concepts of DBMS and its application in different areas, storage, manipulation and retrieval of data using query languages.

DETAILED CONTENTS

1. Introduction   (6 hrs)

    1.1   Database Systems
           -    Database and its purpose
           -    Characteristics of the database approach
           -    Advantages and issues of database systems

    1.2   Classification of DBMS Users
           -    Naïve users, users and online users
           -    Database Administrators, Database Designers, System Analysts and Application Programmers

2. Database System Concepts and Architecture   (10 hrs)

    2.1   Data models, Relational, Hierarchical and Network models

    2.2   Schemes and subschemes, instances
           DBMS Architecture

    2.3   -   The External level
           -    The conceptual level
           -    The internal level
           -    Mappings

    2.4   Data Independence
           -    Logical data Independence
           -    Physical data Independence

    2.5   Database Languages and Interfaces
           -    DBMS Language
           -    DBMS Interfaces
           -    Record based and object based systems

3. Data Modeling using E.R. Model (Entity Relationship Model)   (10 hrs)

3.1   Object based and record based models

3.2   Entities and Attributes

3.3   Entity types and Entity sets

3.4   Key attribute and domain of attributes

3.5   Association and Relationship among entities

4.   Relational Model: (12 hrs)

4.1   Relational Model Concepts: Domain, Attributes, Tuples and Relations

4.2   Relational constraints and relational database schemes
- Domain constraints
- Key constraints and constraints on Null
- Relational databases and relational database schemes
- Entity integrity, referential integrity and foreign key

5.   Functional Dependencies and Data Normalization   (14 hrs)

5.1   Functional Dependencies
- Trivial and Non-trivial dependencies, and multivalued dependncies

5.2   Normalization
- Non-loss decomposition and functional dependencies
- First, Second and Third normal forms.
- Boyce/Codd normal form
- Fourth and fifth normal forms

6.   SQL   (12 hrs)

Introduction to Oracle Tools: Oracle DBA, SQL *Plus, Oracle Forms, Report Writer, Oracle Graphics, Oracle Data types: Creating a Table, Creating table from a table, Insertion of data into tables: Inserting single row of data into a table from another table, Updating the contents of a table: Deletion of all row and deletion of a specified number of rows, Select command; Global data extract, Retrieval of specific columns from a table, Eliminations of duplicates from the select statement, Sorting of data in a table, Selecting a data set from table data, Modifying tables: Adding new column, modifying existing columns, After table, Removing, Deleting, Dropping tables, data Constraints: Column level, table level Constraints, Computations in expression: Arithmetic, Logical operator, Range searching, Pattern matching, Oracle functions, Grouping data, Joins, Sub queries, Union, Intersect, Minus clause, Indexes, Views, Sequences, Granting, Revoking Permissions, Creation of report in SQL*Plus

LIST OF PRACTICAL

1.   Overview, Features and functionality, Application development in MS -Access
2   Exercises on different forms of select statement
3.   Exercises on group by and having clause
4.   Exercises on creation of tables
5.   Exercises on creation of tables using constraints
6.   Exercises on insertion of data into tables
7.   Exercises on deletion of data using different conditions
8.   Exercises on UPDATE statement

INSTRUCTIONAL STRATEGIES

Explanation of concepts using real time examples, diagrams etc. For practical sessions books along with CDs are required. Various exercises and small applications should be given along with theoretical explanation of concepts.

RECOMMENDED BOOKS

1.   An introduction to database systems by Date C.J. Adison Wesley

2.   Fundamentals of Database Systems by Elmasri/Navathe/Adison Wesley

3.   An Introduction to database systems by Bipin C. Desai, Galgotia Publications Pvt.

      Ltd.,

4.   SQL Unleashed by Hans Ladanyi Techmedia

5.   Oracle 8, The complete reference by Koch and Loney, Tata McGraw Hill

      Publications

6.   Fundamentals of Data Base Management System by Dr Renu Vig and Ekta

      Walia, ISTE, Publications, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	6	10
2.	10	20
3.	10	20
4.	12	15
5.	14	20
6.	12	15
Total	**64**	**100**

VISUAL BASIC

L T P
2 - 4

RATIONALE

VB is a programming language, which enables a programmer to write programs and develop application packages to produce solution to live problems. After undergoing this course, the students will be able to understand the principles of Active-X objects and write programs in VB.

DETAILED CONTENTS

1. Introduction to Visual Basic   (3 Hrs)
    Features and applications of VB – concept of integrated development environment (IDE) – project application like standard EXE, Active -X EXE, Active-X DLL and Active-X Control – Browsing through Menus – saving, debugging and distributing VB applications.

2. Designing the User Interface   (6 Hrs)
    Design aspects of VB forms – Elements of user Interface – properties of controls – textbox, label, command button, check box and list box – designing forms and displaying messages using above controls, Control arrays.

3. Menus and Common Dialogue Control   (3 Hrs)
    Creating menus at design time using menu design window – control menus and runtime, create shortest keys for pull down menus, Common dialogue control.

4. VB Structure   (7 Hrs)
    Variable declaration types – user defined data types, scope and life of a variable, arrays, Constructors, Control flow statements, procedures and functions.

5. Display and Printing Information   (7 Hrs)
    Font setting – display text in forms and picture boxes, display tabular data in report form, date and time, fundamentals of printing, printing with print form method.

6. Data Base Programming   (6 Hrs)
    Properties of data control, data control object - ADO, connecting database tables using data controls

LIST OF PRACTICALS

1) Exercise on opening projects like standard Exe, Active-X EXE and Active-X control

2) Exercise on all the menus of opening window of VB

3) Exercise on all basic controls

4) Exercise on form designing

5) Exercise on small application using appropriate commands

6) Exercise on menus

7) Writing programs using arrays

8) Exercise on creating reports

9) Developing a mini project

INSTRUCTIONAL STRATEGY

This subject deals with the programming concept of VB and the subject is having both theory and practical. While imparting instructions to the students, the teacher should stress on the usage of various built in Active-X Controls and data base files so that with their help the students can develop application packages of their own

RECOMMENDED BOOKS

1.   Mastering VB, by Evangelous Petroustsos BPB Publications, New Delhi

2.   Teach Yourself VB by Techmedia Publications, New Delhi

3.   Microsoft VB Manual by MS Press

4.   Visual Basic by Scott Warner- TMH Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	3	10
2.	6	20
3.	3	10
4.	7	20
5.	7	20
6.	6	20
Total	**32**	**100**

MANAGEMENT INFORMATION SYSTEM (MIS)

L T P
4 - -

RATIONALE

This topic makes students aware of organization structure and role of each individual working at various levels. It is also intended to apprise the students of latest technological advancement in the field.

DETAILED CONTENTS

1. Introduction to Management Information System (10 hrs)

   What is MIS, meaning, need, role and importance. Evolution of MIS, Component of MIS, Traditional management system. Common managerial process-Planning organization and controlling.

2. Information Technology and MIS: (12 hrs)

   What is information, characteristics need and functions, process of generation of information, types of information system: -TPS, DSS, MIS assumptions and limitation of each system

3. Level of management (12 hrs)

   Strategic, tactical, and operational level, different functions of each level , flow of information in levels. Effectiveness and efficiency criteria at each level

4. Influence of Information Technology (12 hrs)

   Problems with MIS, causes and solutions, ERP (Enterprise Resource Planning), SCM (Supply Chain Management), CRM (Customer relationship Management).

5. Information System (6 hrs)

   Expert system, Knowledge based system.

6. E-Books and E-journals (6 hrs)

   creating, uploading and downloading, issues, efficiency, considerations.

7. Application used in IT enabled services (6 hrs)

   Electronic Conferencing, Call Centers, Electronic commerce, telemedicine web help desk, data centres, Medical transcription

INSTRUCTIONAL STRATEGY

To use one particular organization as a model and to justify the role of each individual.

RECOMMENDED BOOKS

1.   MIS, organization and Technology, Prentice Hall Landon & Landon

2.   MIS, THM Publication Zed Jawadekar

3.   MIS, Managerial perspective, Macmillan Publications By D.P. Goyal

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	10	14
2	12	20
3	12	20
4	12	20
5	6	8
6	6	8
7	6	10
Total	**64**	**100**

Elective - I
NETWORK OPERATING SYSTEM USING LINUX

L T P
3 - 3

RATIONALE

The knowledge of this subject will enable the students to understand the concepts of Linux and its potential. The students will also get hands on experience of Linux after undergoing this course. This course will enable the student to administrate the Linux server efficiently.

DETAILED CONTENTS

1. Introduction (5 hrs)
   Introduction, differentiation with other operating systems

2. Linux Commands and Filters (7 hrs)
   Mkdir, CD, rmdir, pwd, ls, who, whoami, cat, more, tail, head, mv, chmod, grep, wc, comm, split, sort, diff, kill, write, merge, mail, news

3. Linux file Structure (8 Hrs)
   Linux files, file structure, listing displaying and printing files, managing directories, file and directory operations.

4. Vi Editor and shell programming (8 Hrs)
   Vi editing commands, advanced Vi editing commands, line editing commands, options in Vi. Simple shell program examples.

5. System Administration Configuration of Linux (10 Hrs)
   System management, managing users, installing and managing devices, floppy disk management, file system administration, backups.

6. Introduction to Servers (10 hrs)
   Samba Server, Telnet Server, FTP Server, DNS Server, DHCP Server, SMTP Server, NIS, NFS, Apache Web Server, Proxy Server

LIST OF PRACTICALS

Installing Linux

1. Creating and managing user accounts
2. Practice on Linux commands
3. Practice on vi commands
4. Write and execute at least 10 programmes in Linux using shells such as
   - Arrange of numbers

- Lower case to upper case
- Greatest of three numbers etc.

5. Create file and folder
6. Searching a file
7. Installation of device drivers
8. Creating user accounts
9. Configuration and installation of Linux Server

INSTRUCTIONAL STRATEGY

This subject must be taught with more practical aspect so as to enable the student excel in the field of Linux

RECOMMENDED BOOKS

1. Linux – The Complete Reference by Richard Peterson, Tata McGraw Hill, New Delhi

2. Linux – Install and Configuration Black Book by Die Annleblanc and Issac Yates, IDG Books India Private Ltd., Delhi

3. Unix, TMH, Publication Sumitabha Das.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	5	10
2.	7	20
3.	8	15
4.	8	15
5.	10	15
6.	10	25
Total	**48**	**100**

Elective-I
.NET TECHNOLOGIES

L T P
3 - 3

RATIONALE

This is an upcoming technology, so the teacher should take pain in making the students conversant with this. The demonstration should be given using .NET software for describing the various features of .NET technology

DETAILED CONTENTS

1.   .NET – evolution   (3 hrs)

Need and perspective in current scenario, .net framework over view structural diagram

2.   .NET framework Base classes   (5 hrs)

User and program interfaces, windows forms, web forms, console applications

3.   XML   (6 hrs)

An overview of XML, use of XML, integrity of XML with databases, XML as the .NET Meta language

4.   Visual Studio .NET   (10 hrs)

Common IDE for all languages, the common language specification, all .net languages, management of multiple language, projects

5.   Language changes   (10 hrs)

Visual basic, C++, C#, overview of C#, data types in C#, control flow in C#, C# classes

6.   Anatomy of .NET Applications: (8 hrs)

Assembly, module, type custom types, metadata and managed data

7.   Introduction to visual basic .NET   (6 hrs)

LIST OF PRACTICALS

1.   Installation of .net

2.   Exploring the various features of .net

3.   Ability to work and start various tasks and features of .net framework

4.   Able to work and develop program in Visual Basic.net

5.   To explore in detail Visual Studio.net

INSTRUCTIONAL STRATEGY

.NET being a new technology subject, the teacher should lay considerable emphasis on giving various examples while imparting instructions to the students. Practice exercises will reinforce understanding of various features of this language and will develop requisite abilities to develop programs.

RECOMMENDED BOOKS

1.   Introducing .NET by James Conard, Patrick Rengler, Birn Eranics, Jay Elynn Wron Publications

2.   Microsoft Visual C# .Net Step- by-Step, by sharp and Jagger, PHI

3.   Introducing Microsoft .Net, 3rd Edition by Platt, PHI

4.   Visual Basic .Net by Tony gaddis, Scott Jones Publishers

5.   ODP with Microsoft Visual Basic .Net and Microsoft Visual C# .Net Step- by-Step, by Reynolds- Haertle, PHI

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	3	10
2.	5	5
3.	6	15
4.	10	20
5.	10	20
6.	8	15
7.	6	15
8.	**48**	**100**

Elective-I
VISUAL C++

L T P
3 - 3

RATIONALE

Visual programming is the programming technique to make the task easy. This type of programming has become very helpful for designing window based application. This subject will give the student in depth understanding of the functions used in Visual C++.

DETAILED CONTENTS

1. Visual C++ (8 hrs)

    VC++ developer studio, VC++ Runtime library, VC++ MFC and template libraries, VC++ Building tool, Active X

2. C++ Classes (6 hrs)

    Class creation, accessing class members, encapsulation, constructor, destructors

3. Deriving C++ Classes (10 hrs)

    Class derivation, constructor for derived classes, creation of numbers of classes, managing classes, using class view, overloading operation, C++ template, exception handling in C++

4. Windows GUI programming with MFC library (10 hrs)

    Creation and building the programs, source code generation, building and running program, adding message handling function, adding menu commands, adding tool bar and status bar, scrolling and splitting views

5. Dialog Boxes (8 hrs)

    Dialog boxes, design of dialog boxes, creating classes to manage dialog boxes, defining message handler

6. Dialog Based Application (6 hrs)

    Creation of a simple dialog based application, multiple document interface

LIST OF PRACTICALS

1. Exercise for developing menu based application
2. Exercise on all basic controls
3. Exercises using dialog boxes
4. Exercises using active X controls

INSTRUCTIONAL STRATEGY

This subject is practice based, so the emphasis may be given to practical exercises of visual C++ during the course of the study which in turn will reinforce the understanding of the subject.

RECOMMENDED BOOKS

1.   Master Visual C++ by Michal J Young; BPB Publication, Delhi

2.   Visual C++ Programming by Stene Holzmer; Pustak Mahal, IDG Books, Delhi

3.   Visual C++ Programming by Yashwant Kanekar, BPB Publications

4.   Visual C++ Projects by Yashwant Kanekar

5.   Teach Yourself Visual C++ in 21 Days by Davis Chapman, Techmedia Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	8	20
2.	6	15
3.	10	20
4.	10	20
5.	8	15
6.	6	10
Total	**48**	**100**

MULTIMEDIA AND APPLICATIONS
(Common with Computer Science and Engineering)

L T P
3 - 6

RATIONALE

Multimedia is a new concept emerged in the recent times. Now this technology is being widely used in web pages, motion pictures and interactive presentations, animation etc. Multimedia has made a significant impact in training/education, business presentations, public information access etc. This course intends to introduce and expose multimedia technology and various factors and features of authoring software. It will also help in making the internet application richer in content and presentation.

DETAILED CONTENTS

1. Introduction   (6 hrs)

    Introduction to multimedia, hypertext, hypergraphics, animation, application in education training, science and technology, business and games

2. Multimedia Hardware   (6 hrs)

    Multimedia PC configuration, features and specifications of sound and video interfaces, OCR, touch-screen, scanners, digital cameras, speakers, printers, plotters, optical disks and drives as CDROM and DVD. Multimedia Networks

3. Multimedia Files   (6 hrs)

    Image and sound file formats, multimedia file formats, compression, standards and techniques, features of software to read and write such files.

4. Photo-shop   (15 hrs)

    Photo-shop environment, image editing tools, specifying and adjusting colors, using gradient tools, selection and move tools, transforming path, drawing and editing tools, using channels, layers, filters and actions

5. Flash   (15 hrs)

    Exploring interface, using selection and pen tools, working with drawing and painting tools, applying color, viewing and manipulating time line, time line/stage relationship, animating (frame-by-frame, tweening), guiding layers, importing and editing sound and video clips in flash, importing and exporting flash files in other applications

LIST OF PRACTICALS

1.   Configuring multimedia devices to PC (Personal computer)

2.   Installing and use of various multimedia devices
        -       Scanner
        -       Digital camera, web camera
        -       Mike and speakers
        -       Touch screen
        -       Plotter and printers
        -       DVD
        -       Audio CD and Video CD
        -       Reading and writing of different format on a frame CD
        -       Transporting audio and video files
        -       Using various features of Flash
        -       Using various features of Photo-shop
        -       Making multimedia presentations combining Flash and Photo-shop such as
                department profile, lesson presentation, games and project presentations

3.   Some working in Director and 3D Max

INSTRUCTIONAL STRATEGY

As the subject is practice oriented, more stress should be given to students to do the work
practically. The features of software packages Photo-shop and Flash are to be
demonstrated in class using LCD projector.

RECOMMENDED BOOKS

1.   Multimedia An Introduction by Villam Casanova and Molina; Prentice Hall of
        India, New Delhi

2.   Multimedia Bible by Win Rosch

3.   Multimedia Making it work by Baughan, Jay

4.   Director and Lingo Bible by John and Nyquist and Rober Martin, IDG Books
        India Pvt. Ltd.,

5.   Mastering Macro Media Director 5 by Feudnon; BPB Publication, New Delhi

6.   Photo-shop for Windows Bible by Deke Maclelland IDG Books India Pvt. Ltd.,
        New Delhi

7.   Multimedia Technology and Application by Hillman, Galgotia Publications, New
        Delhi

8.   Flash 5 Bible by Rein Hardit, IDG Books India Pvt. Ltd.

9.   Flash 5 in easy steps by Vandome IDG Books India Pvt. Ltd.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	6	15
2.	6	20
3.	6	15
4.	15	35
5.	15	15
Total	**48**	**100**

MINOR PROJECT WORK

L T P
-   -   4

Minor project work aims at exposing the students to various developments taking place in the field of information technology. It is expected from them to get acquainted with field of IT / industrial environment at the work place and possess desired attitudes. For this purpose, the concerned teachers must identify curriculums related industrial problems which should be expository in nature and ask students (individual or group) to carry out their investigation/ activity such that enough industrial exposure is gained by them during the process. Depending upon the interest of students may be given exercises as minor project work in any one of the following suggested areas:

1)   CAI – Computer Assisted Instruction (CAI packages can be developed by the students)
2)   Website development and hosting
3)   Desk top publishing (DTP) making use of latest software
4)   Developing projects related to office automation
5)   Software package development for different commercial/ social organizations
6)   Developing a mini project using VB and Access at backend (such as college information system, department information system, leave management system etc.)

Note:
The teachers may guide /help students to identify their minor project work and chalk out their plan of action well in advance.

As a minor project activity each student is supposed to study the operations at site and prepare a detail project report of the observations/processes/activities by him/her. The students should be guided by the respective subject teachers. Each teacher may guide a group of 4 to 5 students.

The teachers along with field supervisors will conduct performance assessment of students. Criteria for assessment will be as follows:

	Criteria	**Weightage**
(a)	Attendance and Punctuality	15%
(b)	Initiative in performing tasks/creating new things	30%
(c)	Relation with people	15%
(d)	Report Writing	40%

List of some of the reputated Industries and institutions where students can be sent for training under minor project work

1. Software Technology Parks of India (STPI)

2. Bhaba atomic Research Centre, Anushakti Nagar, Mumbai

3. Data Centre of J&K Bank, Gurgoan/New Delhi

4. NITTTR, Chandigarh

5. SCL, Mohali, Semi conductor complex, Mohali Chandigarh.

6. CEDTI, Mohali

7. IT Park, Dehradun

8. IT Park, Pantnagar

9. DRDO, Dehradun

10. ONGC, Dehradun

GENERIC SKILL DEVELOPMENT CAMP – I

As per general feedback received from the employers regarding Technician Engineers during formal interactions, the pass outs of polytechnics are labeled of falling short of employable skills which comprises of Communication, inter-personal relationship, leadership qualities, team work, problem solving, managing task, managing self etc. in addition to technical knowledge and skills. We have, therefore, added papers such as English and Communication Skills and Entrepreneurship Development and Management in the curriculum in addition to proposed camps of 3-4 days to be conducted in polytechnics on common and vital issues e.g. Environmental Awareness, Entrepreneurship Development and Generic Skill Development.

It is proposed that a camp of 3-4 days duration on Generic Skills Development (GSD) during 5th semester be organized by arranging expert lectures/discussion sessions either by polytechnic teachers or by eminent educationists from the neighborhood to deal with the following topics. Few students may also be encouraged to prepare on some of these topics and make presentation during the camp. Expert lectures must be followed by distribution of relevant handouts for further study. The attendance of students should be compulsory and marks be awarded under provision of Student Centred Activities.

It is envisaged that such camps will bring in a significant improvement in confidence level and personality of the pass outs from polytechnics.

Suggested list of topics for arranging lectures/discussion sessions:

1. Independent Study Technique
    1.1 Information search, information extraction, storage and retrieval
    1.2 Reading skills
    1.3 Life long learning
    1.4 Continuing education

2. 2.1 Introduction
    2.2 Time Management
    2.3 Stress and emotions
    2.4 Health and hygiene

3. Task Management
    3.1 Task planning and organizing
    3.2 Task execution
    3.3 Task evaluation
    3.4 Event management

4. Action Research
    4.1 Importance and Scope
    4.2 Steps in action research
    4.3 Analysis of data
    4.4 Conclusions and report writing