Goa University
P.O. Goa University, Taleigao Plateau, Goa 403 206, India

Syllabus of PGDCA Programme
Approved by the Board of Studies on 15th May 2006

A brief description of the course.
- Purpose

The course aims to give the students a sound background in theory and practice of Computer Application in various fields. It comprises of various software and hardware subjects. The syllabus of the course conforms to the requirements prescribed by the Goa University and is recognized as a professional course by the Goa University.

- Prerequisites

B.A/B.Sc/B.Com/B.E/B.C.A/B.Ed / any graduate from recognized University.

- Number of semesters, how the courses are distributed

    It consists of two semesters, and semester-wise papers are given as follows:

Semester 1
1. DCA 11 Programming and data structures Using C
2. DCA 12 Computer Organization & Operating system
3. DCA 13 Systems Analysis, Design & MIS
4. DCA 14 Introduction to Database Management Systems
5. EL XX Elective - I
6. DCA 16 Programming Lab I (C programming & Data Structure)
7. DCA 17 Programming Lab II (DBMS lab)
Semester 2
1. DCA 21 Computer Networks
2. DCA 22 Web Technology
3. DCA 23 Introduction to OOP using VB
4. EL XX Elective –II
5. DCA 25 Programming Lab III (Web Technology Lab)
6. DCA 26 Project IV (Semester Long Project work)

- Dissertation

    Students are required to undergo a project work in the second semester. The purpose of this project work is to study and analyse a system / develop a software to automate the task.

With this description (it should not stretch beyond this page) a student/parent should be able to get an idea of the load that is associated with this programme.

PGDCA List of Courses

In the following tables, L refers to lectures, T to tutorials and P to practicals. Description of a course appears on the page number listed in the tables.

Semester I

Semester II

List of Electives (EL)

Course Number and Name	L-T-P (hours /week)	Page number
Unix and Shell Programming	3-1-0	27
E-commerce	3-1-0	28
E-learning	3-1-0	30
Corporate Planning	3-1-0	31
Investment Technology	3-1-0	32
Business Finance	3-1-0	32
Taxation Practices	3-1-0	33

Syllabus of the PGDCA

Compulsory Courses
Semester I

DCA 11 Programming in 'C' and Data Structures

The objectives of the course are :

• to make the student understand structured programming, use of algorithm for problem solving and various constructs of computer program.
• To understand various Data Structures
• To implement the various Data structures using C Language
• To analyse the time and space complexity of algorithms
• To understand the various Sorting and Searching Techniques

1. Overview of Programming
     1.1 Introduction to computer-based problem solving, requirements of problem solving by the computer

2.5.2 for

2.5.3 while

2.6 Arrays

    2.6.1 Array declaration

    2.6.2 One and two dimensional arrays

2.7 Functions – Fundamentals

    2.7.1 General form

    2.7.2 Function arguments

    2.7.3 Return value

2.8 Basic I/O

    2.8.1 Formatted Input/Output

    2.8.2 Unformatted Input/Output

2.9 Program Design Examples

    2.9.1 Summation of a set of numbers

    2.9.2 Generation of fibonacci sequence

    2.9.3 Generation of positive prime numbers

    2.9.4 Finding kth smallest element

    2.9.5 Sorting by insertion

2.10 Advanced features

    2.10.1 Type modifiers and storage class specifiers for data types

    2.10.2 Bit operators, ? operator, & operator, * operator

    2.10.3 type casting, type conversion

3. Advanced Programming techniques

    3.1 Control constructs

        3.1.1 do – while

        3.1.2 switch statement

        3.1.3 break and continue

        3.1.4 exit( ) function

        3.1.5 go to and label

    3.2 scope rules

        3.2.1 local and global variable

        3.2.2 scope rules of functions

    3.3 Functions

        3.3.1 Parameter passing : call-by-value and call-by-reference

        3.3.2 Calling functions with arrays

        3.3.3 argc and argv

    3.4 Recursion

        3.4.1 Basic concept

        3.4.2 Design examples

- Tower of Hanoi

- Recursive Quicksort

4. Dynamic Data Structures in C

5.2.4 #conditional compilation directives : #if, #else, #endif, #ifdef, #ifndef

5.3 C standard Library and header files

    5.3.1 Headerfiles, stdio.h, ctype.h, string.h, stdlib.h, stdarg.h, time.h etc

    5.3.2 Standard library functions

    5.3.3 String functions

    5.3.4 Mathematical functions

    5.3.5 Date and Time functions

    5.3.6 Variable argument list functions

    5.3.7 Utility functions

    5.3.8 Character class test functions

6. Basic concepts of data representation

6.1 Abstract and system defined data types

6.2 Representation, primitive data structures

7. Introduction to Algorithm design and Data Structures

7.1 Design and analysis of algorithms

7.2 Top-down and bottom-up approaches to algorithm design

7.3 Analysis of algorithm

    7.3.1 frequency count

    7.3.2 Complexity measures in terms of time and space

7.4 Structured approach to programming

8. Arrays

8.1 Representation of Arrays : single and multidimensional arrays

8.2 Address calculation using column and row major ordering

9. Stacks and Queues

9.1 Representation of stacks and queues using arrays

9.2 Circular Queues

9.3 Application of Stacks

    9.3.1 Conversion from infix to postfix and prefix expressions

    9.3.2 Evaluation of postfix expression using stacks

10. Linked Lists

10.1 Singly linked list : operations on list

10.2 Linked stacks and queues

10.3 Polynomial representation and manipulation using linked lists

10.4 Circular linked lists

10.5 Doubly linked lists

11. Trees

11.1 binary tree traversal methods

    11.1.1 Preorder traversal

    11.1.2 Inorder traversal

    11.1.3 Postorder traversal

11.1.4 Recursive and non recursive algorithms for above mentioned traversal methods
12. Searching and Sorting
    12.1 Searching
        12.1.1 Sequential and Binary searches
        12.1.2 Indexed search
    12.2 Internal sorting
        12.2.1 Insertion, Selection, Bubble
        12.2.2 Quick and Merge sort
        12.2.3 Heap Sort

MANDATORY READING:

BOOKS:

1. B.W. Kernighan & D.M.Ritchie, The C Programming language, Prentice Hall of India
2. Richard Johnson-baugh & Martin Kalin, Applications programming in C, Macmil international editions, 1990
3. Cooper, Mullish, The spirit of C, Jaico publishing house, New Delhi, 1987
4. R.G.Dromey, How to solve it by computer, Prentice Hall of India, 1992
5. G.H.Gonnet and R.B.Yates, Handbook of algorithm & Data Structure in PASCAL and C
6. M.J.Augenstein and others, Data structure through C, Prentice Hall
7. Robert L. Kruse, Data Structures and program design, Prentice Hall, 1987
8. Aron M.Tenenbaum & others, Data Structures using C, Prentice Hall, 1992

SUPPLEMENTARY READING:
1. Jones, Robin & Stewart, The art of C Programming, Narosa Publishing House, New Delhi
2. Kenneth A., C Problem solving and programming, Prentice Hall International
3. Schildt H., C made easy, Mcgraw Hill Book Company, 1987

DCA-12: Computer Organization and Operating System

1   Introduction and background
        1.1 Evolution of Computers
        1.2 Stored Program Concept and Von Neumann Architecture
        1.3 Information representation and codes
        1.4 Building blocks of computers
            1.4.1 Combinational blocks: Gates, multiplexers, decoders, encoders etc

      1.4.2 Sequential building blocks : Flip flops, registers, counters random access memory etc

2 Register Transfer language and Micro-operations

  2.1 Concept of bus

  2.2 Data movement among registers

  2.3 A language to represent conditional data transfer

  2.4 Data movement from/to memory

  2.5 Arithmetic and logical operations along with register transfer

  2.6 Timing in register transfer

3 Architecture of a Simple Processor

  3.1 A simple computer organization and instruction set

  3.2 Instruction execution in terms of microinstruction

  3.3 Concepts of Interrupt and simple I/O organization

  3.4 Implementation of the processor using building blocks

4 CPU Organization

  4.1 Addressing modes

  4.2 Instruction formats

  4.3 CPU organization with large registers

  4.4 Stacks and handling of interrupts and subroutines

  4.5 Instruction pipelining: stages, hazards and methods to remove hazards

5 Assembly language programming

  5.1 Machine and assembly language

  5.2 Pseudo-operations

  5.3 Subroutines in assembly language

  5.4 Interrupt and I/O programming

  5.5 Examples

6 Microprogrammed Control Unit

  6.1 Basic organization of microprogrammed controller

  6.2 Horizontal and vertical formats

  6.3 Address sequencer

7 Arithmetic algorithm

7.1 Addition and subtraction for sign magnitude and 2's complement numbers

7.2 Integer multiplication using shift and add

7.3 Booth's algorithm

7.4 Integer division

7.5 Floating point representations and arithmetic algorithm

8   I/O organization

8.1 Strobe based and handshake based communication

8.2 Vector and priority interrupts

8.3 DMA based data transfer

9   Memory Organization

9.1 Basic cell of static and dynamic RAM

9.2 Building large memories using chips

9.3 Associative memory

9.4 Cache memory organization

9.5 Virtual memory organization

10 Introduction to system programming

10.1 Assemblers and macro assemblers

10.2 Introduction to loaders and linkers

10.3 Introduction to compilers

10.4 Introduction to operating systems

Books Recommended for reading and reference
Main Reading

1. M.Morris Mano, Computer System Architecture, Prentice Hall, International 3rd edition 1993

2. D.M.Dhamdhere , Introduction to System Software , Tata McGraw Hill, New Delhi, 1986

Supplementary Reading:

3. P.Pal Choudhuri, Computer Organization and Design , Prentice Hall of India Ltd, 1994

4. J.P.Hayes , Computer Architecture and Organization, McGrawHill , New York, 1988.

5. D.A.Patterson and J.L.Hennessy , Morgan Kaufmann. Computer Architecture : A quantitative approach 2nd edition 1996

DCA- 13: System Analysis, Design and MIS

1. Introduction

    1.1. System definition and concepts

        1.1.1. Characteristics and types of systems

        1.1.2. Manual and automated system

    1.2. Real-life Business Sub-Systems

        1.2.1. Production 1.2.2. Marketing

        1.2.3. Personal

        1.2.4. Material

        1.2.5. Finance

    1.3. Systems models: types of models

    1.4. Systems environments and boundaries

    1.5. Real-time and distributed systems

    1.6. Basic principles of successful
    systems

2. Systems Analyst

    2.1. Role and need of Systems Analyst

    2.2. Qualifications and responsibilities

    2.3. Systems Analyst as an agent of change

3. System Development Cycle

        3.1. Introduction to systems development life cycle (SDLC)

        3.2. Various phases

        3.2.1. Study

14. Case Study i. MIS for Accounting and Finance Function ii. MIS for Personnel Systems iii. MIS for Marketing Systems.

BOOKS:

Main Reading

1. Marvin Gore, John Stubbe, Elements of System Analysis , Galgotia Book Source
2. Whiten, Bently and Barlow, System Analysis and Design Methods, Galgotia Publication.
3. Elias M. Awad, System Analysis and Design, Galgotia Publications.
4. P.S. Grover, System Analysis and Design, BPB publications

DCA-14: Introduction to Database management

1. Overview of database management
1.1 data, information, and knowledge
1.2 Increasing use of data as a corporaqte resource
1.3 Data processing versus data management
1.4 File-oriented approach versus database-oriented approach to data management
1.5 Data independence
1.6 Database administration rules
1.7 DBMS architecture
1.8 Different kinds of DBMS users
1.9 Importance of data dictionary
1.10   Contents of data dictionary
1.11   Types of database language
1.12   Data models

2. Traditional data Models
2.1 ANSI/SPARC 3-level architecture and the place of logical data models in this architecture
2.2 A brief overview of the three traditional models, namely, hierarchical model, network model, and relational model
2.3 Data definition and data manipulation constructs in each of the three models with examples
2.4 A compareison of the three models

3. Relational Models
3.1 Definition of relation; properties of relational model
 (Codd's rules or equivalent)
3.2 Concept of keys: candidate key, primary key, alternate key, foreign key
3.3 Fundamental integrity rules: entity integrity, referential integrity
3.4 Relational algebra: select, project, cross product, different types of join (theta join, equi-join, natural join, outer joins); set operations

3.5 Tuple relational calculus

3.6 Domain relational calculus

3.7 Simple and complex queries using relational algebra

3.8 Stand-alone and embedded query languages

4. SQL

4.1 SQL construct (SELECT…FROM…WHERE…GROUP BY…HAVING…ORDER BY…)

4.2 INSERT, DELETE, UPDATE

4.3 VIEW definition and use

4.4 Temporary tables

4.5 Nested queries

4.6 Correlated nested queries

4.7 SQL standards (SQL '86, SQL '89, SQL '92)

4.8 Transaction processing and SQL

4.9 Integrity constraints:Not null, unique, check, primary key, foreign key references

5. Embedded SQL and Application Programming Interfaces

5.1 Limitation of SQL in handling complex applications

5.2 Programmatic access to relational applications

5.3 static embedded SQL

5.4 Use of SQLCA/SQLSTATE and dynamic embedded SQL

5.6 SQLDA

5.7 Application programming interfaces (APIs)

5.8 Type sof API calls

5.9 Native API's

5.10 Introduction to ODBC (Open database Connectivity)

6. Database Design

6.1 ANSI/SPARC 3-level architecture

6.1.1 Conceptual model

6.1.2 logical model

6.1.3 physical model

6.2 Entity-Relationship model as a tool for conceptual design- entities, attribute, and relationships

6.3 ER diagram

6.3.1 Strong and weak entities

6.3.2 Generalization, specialization, and aqggregation

6.4 Converting an E-R model into relational schema

6.5 Normalization concepts in logical (relational) model; update anomalies

6.5.1 Functional dependencies

6.5.2 Multi-valued dependencies

6.5.3 Join dependencies

6.5.4 Normal forms (1NF, 2NF, 3 NF, BCNF, 4NF, 5 NF, Domain-key normal forms)

6.6 Issues in physical design

6.6.1 Concepts of indexes

6.6.2 File organization for relational tables

6.6.3 Denormalization

6.6.4 Clustering of tables

6.6.5 Clustering indexes

7. Overview of Advance DBMS

(*These topic is included to give the students a general idea of the more advanced topics in DBMS. Therefore, the topics indicated will be covered only at an overview level. The treat,ment of the subject and examining the concepts taught are required to be only at a surface level*)

7.1 Database internals

7.1.1 Types of file organization used in contemporary database management software (heap, hashing, ISAM and B-tree)

7.1.2 Buffer management

7.2 Query optimization

7.2.1 Query processing processing stages and what is done in each stage

7.2.2 Use of query execution plans in improving application performance

7.3 Query processing

7.3.1 ACID p[roperties of transaction

7.3.2 Examples of transaction

7.4 database concurrency and database recovery

7.4.1 Ill effects of concurrency

7.4.2 Transaction logs

7.4.3 Concepts of two phase locking

7.4.4 Deadlocks

7.5 Introduction to distributed databases

7.6 Introduction to client server databases

7.7 Introduction to object-oriented databases

7.8 database security

BOOKS RECOMMENDED FOR READING AND REFERENCE

MAIN READING

1. A. K. Majumdar, P Bhattacharyya, database Mnagement Systems, McGraw-Hill, 1996
2. H. Korth, A Silberchatz, database System Concepts, McGraw Hill (second edition), 1991
3. R. Elmasri, S. Navathe, Fundamentals of Database Systems, Benjamin Cunnings (second edition), 1994
4. F. McFadden, J. Hoffer, Modern Database management, Benjamin Cunnings (Narosa) (Fourth Edition), 1994

SUPPLEMENTARY READING

1. PETER Rob, Carlos Coronel, Database Systems: Design, Implementation and Management, Wadsworth Publishing Company, 1993
2. C.J.Date, an Introduction to database Systems, Volume 1, Addison Wesley, fifth Edition, 1994
3. J. D. Ullman, Principles of Database Systems, Galgotia Publishing (Second edition),, 1994
4. D. M. Kroenke, Database Processing: Fundamentals, Design, Implementation, Prentice Hall (Fifth Edition), 1994

DCA -16 PL-I C and Data Structures Lab

Programming exercises and project using C-Programming Languages.
Exercise to study various features of the languages. Stress to be laid on writing well structured modular and readable programs accompanied by good documentation. Case studies of use of various data structures in applications such as sorting, searching string manipulation and list manipulation.

- Sparse Matrix implementation using list
- Polynomial evaluation.
- Postfix / Infix conversions using stacks
- Huffman encoding
- Line Editors
- Priority Queues using Heaps
- Expression evaluation using trees
- Implementation of B-trees.

DCA 17- : PL -II DBMS laboratory

Design and development of Database Applications on Commercial RDBMS platform:
(Students are expected to achieve a level of competence in at least one of the standard commercial RDBMS products under desktop or multi-user environment to be able to develop a small to medium application, the student must also acquire skills for independent designing online database application)
Skills required include
Database Design
Application Design
SQL
Embedded SQL
Trouble Shooting
Performance tunning and documentation.
(In application design, focus should be on on-line applications in database environments. Students should get sufficient insight into issues in menu design, screen design, datra validations in data entry screens, report designs and an overview of GUI design. These skills must be demonstrated through the course project including project report and viva-voce.
Study features of commercial RDBMS packages such as ORACLE, FoxPro, Ms Access and SQL. Use SQL with RDBMS. Laboratory exercises should include defining scheme for applications, creation of a database, writing SQL queries to retrieve information from database. Use of host language interface with embedded SQL. Use of Forms and report writer package available with chosen RDBMS product.
Some sample applications which may be programmed are given below
Accounting for a shop
Database Manager for magazine agency or newspaper agency
Ticket booking for performance
Preparing greeting and birth day cards
Personal Accounts
Doctor's diary and billing

Personal bank accounting
Class marks management
Hostel accounting
Video tape library
History of cricket scores
Cable transmission program manager.

Semester II

DCA -21 Computer Networks

- Introduction to computer networks Advantages of Networks. Point to point and multi drop circuits. Data flow and physical circuits. Network   topologies. Topologies and design goals. Hierarchical topology, Horizontal topology, Star topology. Ring topology, Mesh topology Fundamentals of communication theory. Channel speed and bit rate. Transmission media. Voice communication and analog waveforms. Bandwidth and frequency spectrum connecting analog and digital world, digital signal, the modem. Asynchronous and synchronous transmission, synchronizing network components and synchronization codes

- Wide area and local area Networks connection oriented and connections networks Classification of communication protocols. Polling / Selection system. Non polling systems. Time division multiple access. Time division multiplexing. Carrier Sense (non collision) systems. Token passing (priority) system Communication satellites. Geosynchronous and low orbit satellite. Satellite versus Fiber.

- Layered Protocols and OSI model Goal of layered protocols. Network design Problems. Interfaces and services. Services primitives. Relationship of services to protocols, communications between layers. Introduction to Standard organization and OSI model Layers of OSI status. GOSIP version 1 and 2.

- Polling / Selection Protocols Character and bit protocols, Sliding window protocols using go back n and selective reject, HDLC, HDLC options. HDLC frame . HDCL transmission process, HDCL subsets, SDCL, Protocol conversion.

- Local Area Networks Why LANs? Primary attributes on a LAN, Broadband and Baseband LANs, IEEE Lan standards, Relationship of 802 standards to the ISO/CCITT model, connections options with LANs, LIC and MAC protocol data units, LAN topologies and protocol, CSMA/ CD and IEEE 802.3 Token (priority), Token bus and IEEE 802.4. Comparison of 802.3, 802.4, 802.5, Metropolitan Area networks (MANs), ANSI Fiber distributed data interface (FDDI), Transparent and Source routing Bridges.

- Switching and Routing Networks, Circuit. Message and Packet switching. When and when not to use packet switching, packet routing, packet switching support to circuit switching. Networks, virtual circuits. Adaptive and Non adaptive routing algorithms, congestion control.

- The X.25 Networks and supporting Protocols Features of X.25, Layers of X.25, X.21, X.25 and data link layer, Features of X.25, X.25 channel options, Flow control principles. Other packet types, Packet formats, X.25 facilities, Communication between Layers, Frame relay and X.25 stacks.

- TCP/IP, TCP/IP and internet working , Examples of TCP/IP operations, Related protocols ports and sockets, IP address structure, Major features of IP, IP Datagrams, Major IP service, ICMP, TCP, Major features of TCP, Passive and active opens , TCP segment. Flow and Congestion control, UDP, Route discovery protocols examples of discovered protocols. Overviews of Application layer protocols TCP/IP.

- Upper layer Protocols Networks security, Firewalls, Encryption, DES, Public Key Cryptography. Authentication and digital signatures ASN.1, Basic encoding rules (BER), SNMP.

References

1. Black U., "Computer   networks, Protocols , standards   and Interfaces" Prentice Hall of India 1996.

2. Tanenbaum A.S. "Computer   networks" Prentice Hall of India, 1997.

3. Stalling W., "Computer Communication Networks" (4th edition) Prentice Hall of India 1996

DCA –22 Web Technologies

Internet: an introduction to different internet services, e-mail ftp, telnet, news, www, WWW:
Introduction to 2 tier and 3 tier architectures using client/ server technologies, HTTP.

Java : Data Types , Operators and Language Constructs, Java Virtual Machine, Classes and Objects, Inner Classes and Inheritance, Interface and Package. Exceptions. Threads Exploring java.lang, java .util, java.io.

Client end technologies: Document markup languages – HTML, CSS, Document Object Mode, client side scripting using Javascript, DHTML, XML, Applet Programming in java.

Server End technologies: Web server, application server, Introduction to Servlets, Java Server Pages (JSP), JDBC.

Web Technologies and their effect on Web design: cookies, multimedia in web design, animation sound video.

Site delivery and management

Reference:
- Balgurusamy "Programming in Java" "Tata McGraw Hill 2nd Ed.
- Eric Ladd et. AI "using HTML4, java 1.2 "Platinum ed , Prentice Hall India
- David Flanagan, SPD, India "Javascript - The Definitive guide "3" ed.
- Tanenbaum A.S. "Computer networks" 3rd ed . Prentice Hall 1997
- Phil Hanna . "The Complete Reference" JSP2.0" Tata McGraw Hill ed 2003
- Karl Moss "Java Servlets 2nd ed Tata McGraw Hill
- David Gallardo, burnette "Eclipse in Action " Dreamtech Press
- Steve Holzner "Eclipse", O' Reilly Publ.

Laboratory using Eclipse IDE recommended for practical work.

DCA- 23 Introduction to Object Oriented Programming and Visual Basic

1. The Integrated Development Environment :

    Menu Bar, Tool Bars, Project Explorer, ToolBox, the Properties Window

    The form designer

    1.2.1 Form layout

    1.2.2 Immediate window

    Edit, view, run, debug options

    Using the application wizard

2. Managing projects

    Concept of VB project

    Creating the project

    Opening, renaming, and saving the projects

    Elements of the user interface

    Designing the user interface

    Creating forms and code modules

    Aligning the controls

Running the application

 Programming and application

Programming the command buttons

Grouping controls

Visual development and event-driven programming

Common properties

Methods and common events

Customizing the environment

Editor tab, format tab, docking tab, environment tab

3. Introduction to Visual Basic Language

Variables

Declaring variables

Type of variables

Converting variable types

User-defined data types

Special values

Forcing variables declarations

A variable's scope

The lifetime of a variable

Constants

Arrays

Collections

 Procedures, Subroutines, functions, arguments

 Control flow statements

 Loop statements and iteration

4. Working with forms

The appearance of forms

Loading

Showing and hiding forms

Controlling one form within another

Menus

Designing menus

Programming menu commands

Using access and shortcut keys

Manipulating menus at run time

Mouse conflicts, dragging list items

5. Basic ActiveX controls

The TextBox control
Basic properties
Manipulating the control's text
Text selection
Search and replace operations
Capturing keystrokes
The ListBox and ComboBox controls
Basic properties
The ListBox control's methods, arrows
Indexing with the ListBox control
Searching a sorted list
The Scrollbar and Slider controls
ScrollBar control
Scrollbar control's events
Dialog control
Using the common dialog control
Color common dialog box
Font dialog box
The fileopen and filesave common dialog boxes
Print dialog box
Help common dialog box
the File controls

6. Advance ActiveX controls
The RichTextBox control
The RTF language
Text manipulation properties
The RichTextBox control's method
Text formatting properties
Text alignment properties
The MSFlexGrid control
Basic properties
Working with multiple cells
Cell appearance and alignment
Sorting the grid, merging cells
Data entry

7. Graphics with Visual Basic
Form, picture box and image box controls

Sizing images

Loading

Saving images

Setting picture and image properties

Exchanging image through the clipboard

Coordinate systems

Scale properties

Methods

The drawing methods

Drawing text

Drawing lines

Drawing boxes

Filling

Using the circle method, Using the drawing modes

Drawing curves, manipulating pixel, specifying colors, specifying gradients

Using paint-picture method

Processing images

Optimizing issues

Refresh

Transparent Drawings

8. Event-Driven programming

Using timer controls

Writing

The stack mechanism

9. Multiple Document Interface (MDI)

MDI – built-in capabilities

Parent-child menus

Objects and instances

Loading and unloading of child forms

News and open commands

Dynamic-Link-Libraries (DLL)

Declaring a DLL procedure

Calling a DLL procedure

Special considerations when calling a DLL with special data types

10. Database programming with Visual Basic

Client-server programming

File server vs distributed client server, advantages of client/server

Data access option

Data access object

ODBC direct

Remote Data Object(RDO)

Visual Database tools

Using SQL

The format of SQL statements

Attaching queries to a database

Concepts of SQL Server

External tools support

Creating a database

The RDO object

Creating an ODBC data source

The remote data control

The RDO project

Creating a RDO query project

Using transactions with RDO

Writing front-ends

The developers and user's view point

Selecting front-end style

Data-bound controls

Dialog boxes for front-end interfaces

The front-end project

11. Object Oriented Programming with Visual Basic

Preliminary concepts

Classes, instances, objects

Derived classes and base classes, class inheritance

Dynamic binding. Creating object variables, forms as classes

Creating & manipulating runtime controls, using the object browser

Object Linking & Embedding (OLE)

Building ActiveX controls

Modules and class modules

The crypto class, raising errors within a class

Encapsulating database operations

Developing ActiveX controls

User drawn and existing visual basic controls

The user control object

Designing a simple control

Designing and using property pages

The lens-effect control

Internet-enabled controls

12. Programming for the web

The web-browsing controls

The properties of web-browser controls

The internet explorer object

Methods of web-browser controls

Using the web-browser controls

Using hyperlinks in VB applications

Web-development basics

Client/Server on the web

Forms and controls

Embedding a script

Passing parameters to servers

Active Server Pages

Concepts of Active Server Pages(ASP)

Creating an active server page

ActiveX data objects

The file access component

Main Reading

1. McBride P.K. Programming in visual Basic, BPB Publication, 1995.
2. Evangelos Petroutsos Mastering Visual Basic 5, BPB publications, 1997.
3. Ken worthy k. visual basic for applications revealed, Galgotia Publications, 1995.
4. Evangelos Petroutsos and Kevin hough, visual Basic 5 Developer's Guide, BPP Publications, 1997.
5. J.D. Conley III, Visual Basic 5 Development, Techmedia, 1998.

Supplementary Reading

1. Perry G., The complete Idiot's Guide to Visual Basic 3, Prentice Hall, 1996.
2. Will Train, Visual Basic 5 – No Experience Required, BPB Publications, 1997.
3. Nathan gurewich and Ori Gurewich, Teach yourself visual Basic 5.0., Techmedia, 1997.

DCA25 Programming Lab III

This practical paper is based on the theory taught in the Web Technology pper

DCA 26 Project

Students are required to undergo a project work in the second semester. The purpose of this project work is to study and analyse a system / develop a software to automate the task.

EL XX : Unix and Shell Programming

1. Introduction to Operating System
   1.1 Computer systems
   1.2 The operating system as an extended machine and as a resource manager.
   1.3 History of Operating system.
   1.4 Operating system concepts processes, files, the shell
   1.5 Operating system structure: monolithic system: layered system, virtual machines, client server model.
2. Overview of UN IX Architecture
   2.1 Kernel : Processes; Time Sharing
   2.2 Shell
   2.3 Files and directories.
   2.4 Creation of File
   2.5 Incode numbers and filenames
   2.6 File security, file systems
   2.7 Peripheral devices as files.
3. UNIX Editors and Basic UNIX commands
   3.1 ed editor
   3.2 vi editor
   3.3 Redirectories, piping, tees, filters
   3.4 UNIX utilities:grep, sed, awk, tr etc.

4. Introduction to shell Scripts
    4.1 Bourne- Shell
    4.2 C shell
    4.3 'if' and 'case' statements.
    4.4 For, while and until loops
5. Awk Programming
    5.1 Awk: pattern scanning and processing language.
    5.2 BEGIN and END patterns
    5.3 Awk arithmetics and variables
    5.4 Awk built-in variable names and operators
    5.5 Arrays, strings
6. Introduction to Systems Administration
    6.1 Process management
    6.2 Memory management
    6.3 File and Directory Structure.
    6.4 Security.
7. Introduction to System's Administration
    7.1 the system Administration : the need and the role
    7.2 Function of a system Manager
    7.3 Practical aspects of system Administration.
8. Systems Calls and C Function Library
    8.1 UNIX system calls
    8.2 C library function amd math library
    8.3 Standard I/O package
    8.4 File handling.
    8.5 Command line parameters
    8.6 Unix – C- interface.
    8.7 C files
    8.8 Graphics.

Reference:
1. B W Kernighan & R Pike, The Unix, Programming Environment , Prentice Hall of India, 1995.
2. S. Prata, Advanced UNIX- A Programmer's Guide, BPB Publications , New Delhi

EL XX e-Commerce

1. Introduction to Electronic Commerce:

scope of electronic commerce, definition of electronic commerce, electronic commerce and trade cycle, electronic markets, electronic data interchange , Internet commerce, electronic commerce in perspective.

2.The value chain:
supply chain, porter's value chain model ,Inter organisational value chain

3.Competitive advantage:
competitive advantage, porter's model, first mover advantage, sustainable, competitive, competitive advantage using e-commerce

4.Business Strategy: introduction to business strategy: Michael porter's 5 force analysis, strategies of implications of IT, technology ,business environment, business capability, existing business strategy, strategy and implementation planning,

5:Electronic data interchange:
EDI definition ,EDI technology, EDI standards, EDI communication, EDI nuts and bolts, EDI and business, inter-organisational e-commerce

6.Electronic Payment system:
overview of the electronic payment technology, limitations of traditional payment instruments, electronic or digital cash-properties of electronic cash, digital cash in action, electronic check benefits of electronic checks, electronic check in action, net check: A prototype electronic check system, online credit card based system-types of credit card payments, secure electronic transaction, other emerging financial instruments: debit card and POS(point of scale)debit cards and electronic card issues.

7.WWW-web concepts and technology, application

8.Firewall and transaction security

Reference:
1.E-commerce strategy. technology and applications by david whitely: TataMcgraw Hill
2.Electronic commerce A manager's guide by Ravi kalakota and Andrew B.whinston. published by pearson education
3.E-commerce the cutting edge of business by Kamlesh k debjani nag. second edition; TataMcgraw hill

EL XX: E-Learning

1. Introduction to e-learning: (6L)
1.1 What is e-learning
1.2 Scope and form of e- learning.
1.3 Role of an e-learning project.
1.4 Phases in an e-learning project.

2. Course Development for e-learning: (12L)
2.1 Instructional Design.
2.2 The process of Designing instruction.
2.3 Developing Materials. (Story Boarding. Content Integration, and SCORM
                                        Compliance).
2.4 Working with L.M.S. (Learning Management System) – Installation and use of
       the administrator, teacher and student interface. The Course Definition,
       Registration and upload, tracking of results).

3. E-learning and Pedagogical Approaches: (10L)
3.1 The Behaviorist school of learning and its implications on e-learning.
3.2 The Cognitive school of learning and its implications on e-learning.
3.3 The Constructivist school of learning and its implications on e-learning.
3.4 Blooms Taxonomy of Educational Objectives.
3.5 Types of Learning Objectives.
3.6 Content Analysis (Types – facts, concepts, process, procedure, principles)
3.7 The teaching of concepts, procedure, principles, understanding
3.8 Enabling a Motivated Learning Environment.

4. E-learning Strategies: (6L)
4.1 Simulation.
4.2 Drill.
4.3 Interactive learning.
4.4 Problem Solving.
4.5 Tutorials.

5. Assessment Design: (6L)
5.1 Rubrics for Assessment-Analytic and Holistic rubrics.
5.2 Rubrics for Assessment.
5.3 Security and Authentication.

BOOKS RECOMMENDED FOR READING AND REFERENCE
MAIN READING PRACTICALS/Websites:-
1. Working with the following programs:-
a) Photoshop CS.
b) Adobe Audition of Cool Edit Pro
b) Flash.
c) Macromedia Captivate.

Web References:
 http://www.moodle.org
http://www.sakai.org
www.e-learningcentre.co.uk
www.elearningguild.com
www.e-learningguru.com
www.learnframe.com/solutions/standards.asp
www.mediacollege.com
www.washington.eduoea/isaforms.htm
www.brookes.ac.uk/virtual/evaluation/phase2evaluation.html

PRACTICAL LIST:
1. Working on an LMS from OSS like Moodle:
   Moodle installation-installation of server ad client components, configuration and customization of components, creating accounts, giving access rights. Creation of a complete course in Moodle including activities like creating discussion forums, uploading assignments and grading them.

2. Create a complete Multimedia Storyboard using of the S/W applications stated above:
   The learner should be familiar with application of video, audio and animation tools and also the learner should have hands-on with production tools and carry out content creation using these tools. The storyboard content should follow good Instructional Design concepts.

EL XX: Corporate Planning

1. Significance of planning, types, Need Requites, Corporate planning, system approach, Role of the Planner, Corporate planning and budgeting.
2. Social responsibility, Scope, contents, corporation and society, consumers, corporation and democracy, community and government, social responsibility versus profitability and productivity, growth professionalism as a means of social behavior.
3. Mission and purpose, Business definitions- objectives and goals, Environment appraisal, Concepts, components- Scanning and appraising the environment.
4. Organization appraisal, Dynamics, capacity factors, Considerations, Methods and techniques, Structuring, Planning gaps analysis Manager Audit, significance of gaps.

Reference:
1. Kazni A. "Business Policy", Tata McGraw Hill, New Delhi, 1992.

2. Johnson G. et al 3rd edition, "Exploring corporate Strategy", Prentice Hall of India, New Delhi, 1994.

EL XX: Investment Technology

- Source of investment information
- Valuation of debt securities. Debt prices and interest rate risk. Default risk and purchasing power risk. Market interest rates and term structure of interest rates. Valuation of warrants and convertibles. Options pricing models.
- Valuation of equity a; Dividents and valuation. MMS arguments. Fundamentals analysis. Earning multipliers. Timing of purchase and equity shares. Estimating earnings and risk.
- Portfolio theory. Efficient investment and diversification. Markowit graphical portfolio analysis. Markowit theory. Portfolio performances evaluation-sharpe . Treynar Jemsom measures . mutual funds-kinds and evaluation. Behavior of share prices- technical analysis. Efficient market hypothesis- random walk and Martingale methods.

References:
1. Clark J.J et al, "Financial Management A capital Market approach" Helbrook, 1976
2. Sharpe W.F , "Investments" Prentice Hall of India, New Delhi 1996

EL XX : Business Finance

- Financial and economic development, Intermediation, role and patterns, Functions of money and capital market, interst rates determination, term structure.
- Primary capital market, new issues, growth and trends, Financial intermediaries, merchant bankers, managers, brokers, underwriters Secondary market – organization and functioning. Trading and settlement. Problem relating to membership, commission , margins, arbitration and off – flow trading. Reforming the markets SEBI
- Market for govt securities – the discount and finance house. Operation and managerial problems of commercial banks. Inter-bank call money market. Non banking financial institution, leading policies, schemes, composition and quantum of assistance of IDBI, IFCI, ICICI, UTI, LIC, GIC and state level financial corporations.
- Credit rating information, parameters, Role Agencies, CRISIL, regulatory frame work for financial markets and institution,

regulalations vrsus deregulation, role of RBI, bank rate, open market operation policies.

References
1. Copeland T.E et al, "Financial theory and corporate policy", Addison Wesley, Reading MA, 1988.
2. Uppal J.S, "Public Financial Institutions in India", Mac Milan , New York 1984.

EL XX : Taxation practices

- Assessments of undivided families, meaning basic condition , taxable income, partitions, tax planning, assessment of farms and associations, scheme of taxation type, treatment of losses, tax planning
- Assessment of companies types profits, Depriciation, tax planning , section 80, bonus issues, divided policy, return of income and assessment procedure, types of assessment, time limits, reassessment co operatives.
- Collection and recovery of tax deduction at source, rates advanced payment, models of recovery, refund appeals and revision penalties
- Wealth tax chargeability, valuation, return, appeals, revisions, payment and recovery, gift pack chargeability, rebate, assessment, appeals, revision, payment and recovery.
- Central sales tax, concept of sales and purchase, inter-state trade, Inter state export and Import trade, Stat sales tax: Assessing authority, single, multiple, point tax, procedure for registration and cancellation, returns payment appeals and revisions.

References:
1. Central and state tax acts
2. Singhania .V.K, "Taxman Direct Taxes", Taxman, New Delhi, 1996