KERALA STATE CENTRE FOR ADVANCED PRINTING AND TRAINING THIRUVANANTHAPURAM

ONE YEAR DIPLOMA IN COMPUTER APPLICATIONS (DCA)

RULES AND REGULALTIONS

1. The duration of the course is *one year* and there are two semesters in the course.
2. Examinations are conducted by Kerala State Centre for Advanced Printing and Training at the end of each semester.
3. The candidate should acquire not less than 75% of attendance in each subject.
4. Those who have acquired at least 60% of attendance in each subject can appear for examination by remitting a penal fee on the recommendation of the Managing Director.
5. The candidate should have registered for the first semester examination to undergo the second semester and he/she will not be allowed to appear for examination in piece meal
6. The candidate who secure not less than 40% marks in theory and 50% marks in practical will be declared to have passed in that paper.
7. The candidate should have completed the course within 3 years and he/she will be given only 3 chances for attempting each subject.
8. If a candidate passes the examination in the first chance he will be given the class as follows:

Total marks not less than 75%	- distinction
" below 75% and not less than 60%	- first class
" below 60% and not less than 50%	- second class
" below 50% and not less than 40%	- pass

9. If a candidate fails in a subject and passes in subsequent attempts, the minimum marks for pass will be taken into account for awarding class, irrespective of the actual marks.
10. There will be provisions for cancellation. The cancellation is allowed only for all *subjects within 7 days* of the last theory examination.
11. There will be a provision for revaluation of theory examinations provided an application is given to the Controlling Officer within 10 days after the issual of the marklist, along with the prescribed revaluation fee.

SCHEME OF STUDY & EXAMINATION

FIRST SEMESTER

Subject Code	Subject	Theory Hrs./Week	Practical Hrs./Week	Written	Practical	Total
DCA 101	Computer Fundamentals	2	--	100	--	100
DCA 102	PC Software	2	--	100	--	100
DCA 103	Programming in C	4	--	100	--	100
DCA 104	Programming in C Lab	--	2	--	100	100
DCA 105	PC Software Lab	--	2.5	--	100	100
	Total	8	4.5	300	200	500

Subject Code	Subject	Theory Hrs./Week	Practical Hrs./Week	Written	Practical	Total
DCA 201	DBMS and PL (SQL)	4	--	100	--	100
DCA 202	Visual Basic	2	--	100	--	100
DCA 203	DBMS and PL (SQL) Lab	--	2	--	100	100
DCA 204	Visual Basic Lab	--	2.5	--	100	100
DCA 205	Project	--	2	--	100	100
	Total	6	6½	200	300	500

SYLLABUS

COMPUTER FUNDAMENTALS (DCA 101)

Theory　　　　　:　40 Hrs.
No Practical session

Modules

1. Evolution of Computers : 4 Hrs
2. Number system : 8 Hrs
3. I/O Devices : 6 Hrs
4. Memory : 6 Hrs
5. Centrtal Processing Unit : 4 Hrs
6. Data Communication : 10 Hrs
7. Multimedia : 2 Hrs
   Total : **40 Hrs**

DETAILED SYLLABUS

1. **Evolution of Computers**
   1.1　Definition of Computer
   1.2　History and Generation of Computer
   1.3　Analog/Digital Classification
   1.4　Block Diagram of Computer
   1.5　Hardware/Software definition-System software/Application software
   1.6　Operating System
2. **Number system**
   2.1　Different Number Systems-Binary-Octal-Decimal- Hexadecimal
   2.2　Converting from one base to another
   2.3　Shortcut methods for conversion
   2.4　Representation of Negative Numbers
   　　　2.4.1 1's complement
   　　　2.4.2 2's complement
   2.5　Binary Arithmetic

7.1 Components
7.2 Uses of multimedia

PC SOFTWARE (DCA 102)

Theory : 30 Hrs.
Practical : 50 Hrs.

THEORY

Modules

I. Introduction	:	4 Hrs
2 Disk Operating System	:	10 Hrs
3. Windows	:	4Hrs
4. Word Processing Package	:	4 Hrs
5. Spread Sheet Package	:	8 Hrs
Total	:	**30 Hrs**

PRACTICAL

Modules

L DOS Commands	:	6 Hrs
2. Batch Files	:	4 Hrs
3. Windows	:	10 Hrs
4. Word Processing Package	:	14 Hrs
5 Spread Sheet Package	:	16 Hrs
Total	:	50 Hrs

DETAILED SYLLABUS

1. Introduction

1.1 Introduction to computer system

1.1.1 Hardware/Software, System software, Application software

1.2 Operating system

1.2.1 Components and functions of operating system

1.2.1.1 Processor management, Memory management, I/O management, File management.

1.2.1.2 Multitasking, Time sharing

1.3 Booting, Files

2. Disk Operating System

2.1 Types of DOS commands

2.1.1 Internal commands

2.1.2 External commands

2.2 Batch files - Autoexec.bat, config.sys

2.2.1 Batch file commands (ECHO, PAUSE, REM)

3. Windows

3.1 Windows basic

3.1.1 Importance of Windows, GUI, Windows-DOS difference

3.1.2 Mousing techniques

3.2　Windows Operating System

      3.2.1 Starting Windows - Properties of a window

      3.2.2 Using- Task bar, Desktop, Folders - properties, Cut,Copy, Paste, Shortcut. Control Panel, Paint Brush, Notepad, Calculator, Explorer

4. Word Processing Packages

4.1　Importance of word processing - creation of a document - saving a document - opening a document· document views (normal, page layout and outline). font and style changing-bold, italics, underline- zooming the document - bordering. shading, copying, cutting, pasting, inserting date, time, special symbols - summary information - find files - page setup - print preview -printing -find, replace, spell check, grammar check, thesaurus - headers, footers - margin setting, tab setting - footnote end note - column operation - table, picture insertion- document protection - Mail merge

5. Spread Sheet Package

5.1　Electronics spread sheet basics - importance - structure - rows, columns, worksheet data entering - insertion, deletion height width adjustments, hiding and unhiding of rows and columns,naming, font size and style - zooming - autofill, auto sum,arithmetic operators, logical operators, formula, functions if ( ), and ( ),or ( ), copying formula, paste special, sorting, sub totaling, filtering - Auto filtering, advanced filtering, function wizard, using functions, chart wizard, drawing charts, formatting charts.

PROGRAMMING IN "C"(DCA 103)

Theory	: 60 Hrs.
Practical	: 40 Hrs.

THEORY

Modules

1. Introduction to Computer based problem solving	:	4 Hrs
2. Fundamentals of 'C'	:	4 Hrs
3. Control Constructs	:	10 Hrs
4. Arrays & Strings	:	10 Hrs
5. Functions	:	10 Hrs
6. Structures & Unions	:	4 Hrs
7. Pointers	:	8 Hrs
8. File Handling	:	8 Hrs
9. 'C' preprocessors	:	2 Hrs
Total	:	**60 Hrs**

DETAILED SYLLABUS

1. Introduction to Computer based problem solving

1.1　Problem solving strategies

      1.1.1 Steps in program development

DBMS & PL (SQL) - DCA 201 and DCA 203

Theory : 60 Hrs.

Practical : 40 Hrs.

THEORY

Modules

1. Overview of Database Management	:	4 Hrs.
2. Data Models	:	2 Hrs.
3. Relational Models	:	8 Hrs
4. SQL	:	8 Hrs.
5. Database Design	:	8 Hrs.
6. Database Applications using PL/SQL	:	30 Hrs.
Total	:	**60 Hrs.**

I. Overview of Database Management

1.1 Concept of DBMS-Data, Information, field, record, file database systems.

1.2 Definition - Databases database systems, purpose of database management.

1.2.1. Data Models - General Concepts, Types of data models.

1.3 Data processing versus data management.

1.4 File oriented and database oriented approach to data management.

1.5 Data independence

1.6 Database Administration Roles

1.7 DBMS Architecture

1.8 Different kinds of DBMS users

1.9 Data dictionary and its importance

1.10 Types of database languages Sorting and Indexing.

2.Data Models

2.1 Traditional Data Models

2.1.1 3 level architecture - external, cenceptual & internal systems.

2.1.2 Overview of the three traditional models (hierarchical, network and relational data models)

2.1.3. Data definition and data manipulation constructs in each of the three models with example.

3. Relational Models.

3.1 Definition of relations, properties of relational model.

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, Crossproduct, Different types of 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 language.

4. SQL

4.1   SQL constructs (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 and correlated nested queries.

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

4.7   Transaction processing and SQL

4.8   Integrity constraints: Not Null, Unique, Check, Primary Key, Foreign Key, References

5. Database Design

5.1   ANSI/SPARC 3 -level architecture: conceptual, logical, physical.

5.2   Entity - relationship model as a tool for conceptual design - entities attributes and relationships.

5.3   E- RDiagrarn

5.4   Converting an E-R model into relational schema.

5.5   Normalisation concepts in logical (relational) models - update anomalies.

       5.5.1. Functional dependencies, multivalued dependencies,join dependencies.

       5.5.2.Normal forms (1NF, 2NF, 3NF, BCNF, 4NF, 5NF, Domain-key Normal forrm)

5.6   Issues in physical design.

       5.6.1. Concepts of lndexes

       5.6.2. File organisation for relational tables.

       5.6.3. Denormalisation.

       5.6.4. Clustering of tables and indexes.

6. Database Applications using SQL or PL SQL

6.1.   RDBMS Packages.

       SQL commands create, insert, delete, alter, drop, update, group by, built in functions etc.

6.2   PL/SQL

       6.2.1 Data types

       6.2.2 Control statements

       6.2.3 Cursor

       6.2.4 exception handling

       6.2.5 Procedures

       6.2.6 Functions

       6.2.7 Triggers

6.3   Sorting and Indexing

6.4   Quering

6.5   Quering and reporting

6.6   Advance reports

Lab: SQL, PL/SQL, Commands, Table creations and data retrieval

VISUAL BASIC (DCA 202)

Theory   : 30 Hrs.
Practical   : 50 Hrs.

THEORY

Modules

1.	Introduction to VB environment	:	2 Hrs.
2.	Forms, Toolbox, Standard Controls, Properties, Events and Methods	:	6 Hrs.
3.	Visual Basic Programming modules and Design	:	14 Hrs
4.	OOPS and Visual Basic	:	2 Hrs.
5.	Menus and Dialog boxes	:	6 Hrs.
	Total	:	**30 Hrs.**

PRACTICAL

Modules

1.	Introduction - VB environment Opening Screen Terminology	:	4 Hrs.
2.	Forms, Controls, Properties, Events, Methods, Form Design	:	10 Hrs.
3.	Tool Box -Controls- Properties events, methods	:	20 Hrs
4.	VB Programming	:	10 Hrs.
5.	Menu Designing and Dialog Boxes	:	6 Hrs.
	Total	:	**50 Hrs.**

DETAILED SYLLABUS

1. Introduction to Visual Basic

1.1   Windows and Visual Basic Features - version of Visual Basic, differences - a sample application, Steps involved in developing a simple VB application.

1.2   Visual Basic Environment-Menu and Windows - Titlebar, Menubar - SDI (Single Document Interface) Environment - Tool Bar - Standard, Edit, Debug, Form editor - Tool Box and controls - Form Window, Project Explorer - Short cut (pop-up) menus. VB editor - creating simple applications

2. Forms, Tool Box, Controls, Properties, Events and Methods

2.1.   Forms-Controls, Properties,Events & Methods - MDI Forms

      2.1. I. Basic Forms - Creating MDI forms - using from wizard.

2.2.   Tool Box - controls, properties, events and methods.

      2.2.1 Tool Box-Custom controls-properties, events & methods-command button. Text boxes, frame controls, List boxes, Combo boxes, image controls, Timers, Scroll bars, Drive lists, Directory list boxes, file list boxes, message boxes etc.

3. Visual Basic Programming

      Variables, constants, statements, control structures, built-in functions, arrays, files and data bases, procedures, modules and classes

variables, DIM statement, operation on numbers

- 3.1.2. Constants - features, string constants, numeric constants, using numeric expressions for constants, supplied constants in VB.
- 3.1.3. Statements in Visual Basic - Remark, End, Assignment and Property setting,
- 3.2 Control structures - loops, branching, cases
  - 3.2.1 Loops - determinate & indeterminate loops for - Next, nested for-next, Do-Until, Do-While, While-End.
  - 3.2.2. Branching - IF-then, If-then-Else-end if, if-then-Else- if-end if, Nested if
  - 3.2.3. Cases - Select case
- 3.3 Built-in functions, procedure
  - 3.3.1. Built-in functions - string functions. numeric functions.
  - 3.3.2. Procedure - how a procedure is called, commands - BEEP, CALL, Sub, Public, Private etc.
- 3.4 Arrays - using arrays. dynamic arrays.
- 3.5 Files and Database
  - 3.5.1. Files - ASCII files - sequential. random and binary access methods.
  - 3.5.2. Database - Database features, data controls, data control properties, database tables and queries. Creating data base tables - defining tables, adding fields, entering data, creating a query - primary keys, fields, modifying a table.
- 3.6. Modules and classes - Code modules - Introduction, code library, creating and retrieving code modules private and public sub procedures, adding code modules, class modules - methods and properties.

4. OOPS AND VISUAL BASIC

4.1. OOPS concept, properties and methods of an object, inheritance, encapsulation and polymorphism characteristics, creating an object in Visual Basic, general property procedures - creating a new class module.

5. Menus and Dialog Boxes

- 5.1. Menu - Menu Design, MDI forms and Dialog boxes.
  - 5.1.1. Menu Design - understanding menu object, menu properties, check event, menu methods, creating menu with menu editor, menu design, sample menu design window
  - 5 1.2 MDI forms - MDI parent forms - child forms - windows menu - tile - correcting and arranging child windows.
- 5.2. Dialog boxes - predefined dialog boxes, customs dialog boxes, common dialog boxes.
  - 5.2.1 Predefined dialog boxes - creating message *dialog* boxes - input dialog boxes.
  - 5.2.3. Custom dialog box - design
  - 5.2.4. Common dialog boxes - file open / file save, colour choice, print, font choice, methods-show colour, show font, show help, show open, show print, show save.

Practical

1. Visual Basic environment - setting up Visual Basic, running a setup programme running sample application, developing a simple VB application.

2. Opening screen terminology - Windows in the initial screen, forms properties - title bar, menu bar, tool bar, tool box, project explorer, menus, VB editor, creating simple applications.

3. Forms - controls - properties. events and methods form designing - altering forms, properties window - common form properties. sale properties colour properties, printing a form, saving

from file menu, creating VB programs, creating MDI forms, using form wizard, generating reports using crystal reports

4. Tool box - controls - properties events & methods, displaying information on a form - centering text - display data in debug window, print forms method for printing a form.

5. VB Programming - creating program with multiple forms.

6. Menu designing - properties , events, methods, using menu editor, sample menu design window MDI forms - arranging and cascading child windows.

7. Dialog boxes - predefined, custom, common dialog boxes

PROJECT (D CA 2 0 5)

A software development project spread over approximately 20 weeks will have to be taken up by each student of DCA.

1. In developing and reporting softwares, it is suggested that the following guidelines may be followed.

   a) **Analysis**

      study of existing system and its draw backs (general)

      understanding the functionality's of the system (detailed)

      preparation of requirement specification.

      conduct of feasibility study

      identification of relevant object

      abstraction of each object (attributes and method)

      relationship between objects

   b) **Design**

      design of each sub system

      design of each classes

      design of communication between objects

      design of algorithms for problem solving

      user interface design

      any other stage if necessary

   c) Coding and implementation

   d) Testing

   e) Security, backup and recovery mechanism

   f) On line help and documentation

   g) Upgradebility possibilities.

2. Even if students are doing project as groups, each student must independently take different modules of the work and also must submit the reports individually.

3. Each student shall prepare a detailed project report at the end of the semester. At the time of Viva-Voce the candidate's project work will be evaluated in addition to assessing the student over-all ability and knowledge in the field of computer application. He/She is expected to present the project report at the time of Viva-Voce examination.

MANAGING DIRECTOR
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