

**Directorate of Distance Education, University of Kashmir**

**Directorate of Distance Education**

**University of Kashmir**

**Srinagar-190006**

# **Curriculum**

For

**Diploma in Computer Applications**

**(DCA) Programme**

**[2021 & onwards]**

**DCA Syllabus Directorate of Distance Education, University of Kashmir**

# Structure of Curriculum

## SEMESTER-I

S.NO.	Course Code	Course Title	Max. Internal Marks	Max. External Marks	Credits
1	DCA21101	Computer Fundamentals and Applications	25	75	04
2	DCA21102	Computer Programming Fundamentals Using C	25	75	04
3	DCA21103	Data Base Management Systems	25	75	04
4	DCA21104	LAB-I for DCA21101	25	50	03
4	DCA21105	LAB-II for DCA21102	25	50	03
5	DCA21106	Lab-III FOR DCA21103	25	50	03
<b>Total</b>			<b>150</b>	<b>375</b>	<b>21</b>

## SEMESTER-II

S.NO.	Paper Code	Paper Title	Max. Internal Marks	Max. External Marks	Credits
1	DCA21201	Web Programming	25	75	4
2	DCA21202	Data Communication and Networking	25	75	4
3	DCA21203	Lab-IV for DCA21201	25	50	3
3	DCA21204	Project Work	50	200	10
<b>Total</b>			<b>125</b>	<b>400</b>	<b>21</b>

# **Paper Title: Computer Fundamentals and Applications**

**Paper Code:** DCA21101

**Credits:** 04

**Internals:** 25

**External:** 75

## **Unit-I**

Introduction to Computers – Characteristics, Components, Advantages & Limitations. Classification of computers, Software- Classification & Application. Introduction to Operating Systems, fundamentals of DOS & Windows OS. Working with common DOS Internal and External Commands.

## **Unit-II**

Introduction to Algorithm-Representation, advantages & Limitations. Introduction to Flow Chart- Symbols, Levels, Rules, Advantages & Limitations. Introduction to Programming Languages-Levels & Translators. Introduction to Internet-Working & Applications.

## **Unit-III**

Introduction to MS Office Package. MS Word- fundamentals & Advantages. Text Formatting, Bullets, Inserting Graphics, Tables, Hyperlinks, Mail Merge, Macros & Templates. MS Excel-Fundamentals & Advantages. Formulas & Functions. Inserting Charts & Graphs.

## **Unit-IV**

MS PowerPoint- fundamentals & Advantages. Design Template & Auto Content Wizard. Color & Animation Schemes. SlideMaster & Package for CD. MS Access-Fundamentals & Advantages. Tables, Queries, Forms, Reports, Macros & Modules. Understanding Field Properties, Indexing a Field.

**Text Book:** P.K. Sinha, Computer Fundamentals, 2005, BPB New Delhi

## **Reference Books:**

1. P.K. Sinha, Computer Fundamentals, 2005, BPB, New Delhi
2. Peter Norton, Inside the PC, 2001, SAMS Tech Media
3. Taxali, PC Software, 2005 Tata McGraw Hills, New Delhi.
4. Suresh K. Basandra, Computers Today, 2005 , Galgotia Publications.

# **Paper Title: Computer Programming Fundamentals Using C**

**Paper Code: DCA21102**

**Credits: 04**

**Internals: 25**

**External: 75**

## **Unit-I**

Introduction to C Programming Language- History, Features & Advantages, and Language Constructs. Structure of a C program, Character Set & Tokens, Identifiers & Keywords, Constants & Variables, Declaration & Scope of Variables, Data Types. Simple & Compound Statements, Input/output Statements, Expressions & Operators-Arithmetic, Relational & Logical, Bitwise, Unary, Binary & Tertiary Operators. Precedence and Association. Storage Classes-Auto, Extern, Static, Register.

## **Unit-II**

Control Flow Statements-IF-Else Statements, Elself Ladder, Switch-Case Statement, Goto Label Statements. Nesting of Control Flow Statements. Array-Declaration, One Dimensional and Multi-Dimensional arrays. Structure– Declaration, Accessing Structure members, Nesting of Structures. Union- Declaration, Accessing Union members, Array of Structures & Unions. Difference between Union and Structure.

## **Unit-III**

Introduction to Pointers, Pointer arithmetic, Pointer to Pointer. Introduction to String. Functions- Advantages & Signature. User Defined and Library Functions, Prototype of a function, Array as Function Argument, Structure as Function Argument. Return Statement. Recursion. Pass by Value. Pass by Address.

## **Unit-IV**

Introduction to Header Files & Standard Library. C Pre-Processor & Macros. Standard IO Statements. Format Specifiers. File Processing in C and Command Line parameters.

**Text Book:** Brian Kernighan and Dennis Ritchie, “C Programming Language,” PHI

## **Reference Books:**

1. Brian Kernighan and Dennis Ritchie, “ C Programming Language,” PHI
2. Yashwant Kanetkar, “ Let us, C”, BPB
3. E. Balaguruswami, “Programming in ANSI C”, Tata McGraw Hill.
4. Herbert Schild, “ C The Complete Reference”, Tata McGraw Hill.

# **Paper Title: Database Management Systems**

**Paper Code: DCA21103**

**Credits: 04**

**Internals: 25**

**External:75**

## **Unit-I**

Introduction to Database- History, Characteristics, Users and Advantages, Classification of Database, Data Models, Schemas & Instances. Three Schema Architecture & Data Independence. DBMS Languages & Interfaces. Conceptual Data modeling using ER Model.

## **Unit-II**

Relational Data Model Concepts- Domains, Attributes, Tuples, Relations & their characteristics. Relational Data Model Constraints-Entity Integrity, Referential Integrity, Foreign Keys and other Relational Database design using ER to Relational Mapping.

## **Unit-III**

Design guidelines for Relation Schemas. Functional Dependencies. Normalization of Relation Schema. Normal Forms based on Primary Key (1NF, 2NF, 3NF, BCNF, 4NF) Lossless Join & Dependency Decomposition. Introduction to Transactions, Concurrency Control, Schedules & Serializability.

## **Unit-IV**

SQL-History & Overview, Creating & Manipulating Tables. Introduction to Query Processing –DDL, DML & DCL, Transaction Processing. General Syntax, Clauses, Expressions, Conditions, Operators, Built-in & Group Functions. Sub-Queries and Joins, Views, Sequences, And Nested Queries.

Text Book: Elmasri R. and Navathe S.B. Fundamentals of Database Systems, Addison Wesley.

## **Reference Books:**

1. Dates. C, "An Introduction to Database Systems." Pearson Education, Asia.
2. A. Silberschatz, H.F. Korth and S. Sudarshan, " Database System Concepts", 3<sup>rd</sup> edition, 1997, McGraw-Hill , International Edition.
3. Ivan Bayross, "SQL & PL/SQL using Oracle 8i & 9i SQLJ", BPB.
4. William Page, "Using Oracle 8i-Special Edition", Que /PHI.

# Paper Title: Web Programming

**Paper Code:** DCA21201

**Credits:** 04

**Internals:** 25

**External:** 75

## Unit-I

Introduction to the Internet, Introduction to HTML Terminology, HTML4 Versus HTML5, Options for Writing HTML, Design Considerations and Planning, Basic Tags and Document Structure, Headings, Lists, Links, Images, Audio, Video, Tables, Forms-methods, elements

## Unit-II

Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model (Introduction, Border properties, Padding Properties, Margin properties), CSS Advanced (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute selector), CSS Color, Creating page Layout and Site Designs. Transformations, Animations

## Unit-III

PHP , Server-side web scripting, Installing PHP, How PHP scripts work , Basic PHP syntax , PHP data types, PHP Variables, Operators in PHP, Conditional Statements , Loops (If, If else and Switch) ,Strings, Arrays and Array Functions, Numbers, PHP Function: User-Defined Functions, Inbuilt functions, Basic PHP errors / problems, Working with Forms, Designing a Form, \$\_GET and \$\_POST, HTML and PHP code, User Input, Form Validation, Cookies, File uploading, Sessions

## Unit IV

How to PHP MySQL Integration Works? ,Creating a database connection, Selecting the DB, Inserting data in database, Inserting data with a File, Retrieving data from Database, Retrieving data with specific criteria, Updating records, Searching the records, Alter table structure, Deleting the records Dropping tables. Emailing with PHP

## Reference Books:

1. Learning PHP, MYSQL & JavaScript, Robin Nixon, Shroff Publications
2. PHP Cookbook: Solutions & Examples for PHP Programmers, David Sklar, Adam Trachtenberg, O'Reilly
3. Modern PHP: New Features and Good Practices, Josh Lockhart, O'Reilly Publications
4. Introducing HTML5, Bruce Lawson, New Riders
5. Hard Boiled Web Design, Andy Clarke, Five Simple Steps Ltd
6. CSS: The Missing Manual, David McFarland, POGUE PRESS, O'Reilly Publications

# **Paper Title: Data Communication & Computer Networks**

**Paper Code:** DCA21202

**Credits:** 04

**Internals:** 25

**External:** 75

## **Unit-I**

Communication concepts- Characteristics of Signal (Amplitude, Frequency, Period, Wavelength). Time & Frequency domain View of Signal. Relationship between Data Rate & Bandwidth, Analog & Digital Data Transmission. Transmission Impairments. Channel Capacity for noiseless channel (Nyquist Law) and noisy channel (Shannon's Law). Data Rate versus Baud Rate.

## **Unit-II**

Data Transmission Concepts-Simplex, Half Duplex & Duplex Guided Transmission Media, Twisted Pair, Co-axial Cable & Optical Fiber. Unguided Transmission Media-Terrestrial & Satellite Microwave. Factors affecting transmission Distance and Data rate.

## **Unit-III**

Concept of Multiplexing. FDM. Synchronous and Statistical TDM. Reliable Transmission of data: Asynchronous and Synchronous transmission. Error detection: Parity –based, CRC-based.

Data encoding. Difference between modulation and encoding. NRZ-L, NRZ-I encoding. Multilevel Binary and Biphasic Coding techniques and their implementations. ASK, FSK, PSK and QPSK. PCM concepts: sampling, quantization. Delta Modulation. Amplitude Modulation.

FCS Computation. Error Control and recovery techniques. Concept of ARQ standard and its versions.

## **Unit-IV**

Goals and applications of networks. LAN, MAN & WAN Architectures. Concept of WAN subnet. Overview of existing networks. Need for a Protocol Architecture. OSI Reference Model Architecture, TCP/IP Model and their Comparison.

Text. Book: William Stallings, "Data and Computer Communications", Pearson Education.

## **Reference Books:**

1. William Stallings, "Data and Computer Communications" , Pearson Education.
2. Andrew Tanenbaum, "Computer Networks", Pearson Education 4/e.
3. Ulyesses Black, "Principles of Data Communications", PHI.
4. Morley , Gelber, "The Emerging Digital Future" , Addison-Wesley.

## Paper Title: Lab-I for DCA21101

Paper Code: DCA21104

Credits: 03

Internals: 25

External: 50

### Unit-I

#### DOS

- a) Demonstration of basic internal and external commands
- b) Creating a batch file
- c) Passing an argument to a batch file

#### MS Word

- a) Formatting a word document, changing margins, size, orientation and inserting breaks, new sections, watermarks, page borders
- b) Creating an automated table of contents, table of figures, inserting an index, citing references and inserting bibliography
- c) Using Mail merge & Macro

### Unit-II

#### MS Excel

- a) Referencing Cells range of cells- absolute and relative referencing
- b) Using basic date time, statistical, logical and text functions
- c) Conditional statements
- d) Development of Students Grading system
- e) Calculation of Gross Salary of Employees

### Unit –III

#### MS Power Point

- a) Using templates for designing presentations
- b) Inserting transitional effects, timings
- c) Adding animations
- d) Using different monitors for different viewings
- e) Using presentation views and master views

#### MS Access

- a) Creating/designing a table using wizard
- b) Query Designing using wizard
- c) Designing crosstab , update and delete queries using wizard and SQL
- d) Developing reports
- e) Importing/ Exporting data from/to other data sources



## Paper Title: Lab-II for DCA21102

Paper Code: DCA21105

Credits: 03

Internals: 25

External: 50

### Unit-I

1. Program to demonstrate the overflow and underflow of different numerical data types and their resolution.
2. Program to draw star triangles of different shapes
3. Program to demonstrate the precedence & associativity of various operators
4. Program to find GCD & LCM of two numbers
5. Program to convert a given number in figures to words

### Unit-II

1. Program to reverse the contents of a string using
  - a. Iteration
  - b. Recursion
2. Program to demonstrate the uses of passing structures to a function.
3. Program to create user-defined version of following functions
  - a. strlen
  - b. strrev
  - c. strcmp
  - d. strcat
4. Program to demonstrate the concept of pass by value and pas by address
5. Program to demonstrate the concept of passing 1D and 2D arrays to a function

### Unit-III

1. Program to generate Fibonacci series using
  - a. Iteration method
  - b. Recursion
2. Program to copy a file from given source to destination
3. Program to develop a database of students with operations supported as
  - a. Showing a record of particular student
  - b. Deleting a student
  - c. Updating a student
  - d. Inserting a student
4. Program to demonstrate the concept of command line arguments

## Paper Title: Lab-III for DCA21103

Paper Code: DCA21106

Credits: 03

Internals: 25

External: 50

### Unit-I

Q1. Create table Student using SQL with following attributes and perform the following operations?

Attribute Names: ST\_ROLLNO, ST\_NAME, ST\_ADDRESS, ST\_TELNO

- i. Add new attributes City, Street, Country with Datatype Varchar and length 30?
  - ii. Modify field ST\_ROLLNO and change the size to 5?
  - iii. Remove column ST\_ADDRESS?
  - iv. Describe the Table Student?
  - v. Drop Table Student?
  - vi. Copy Structure of one table to another
- Q2. Create table Student with following attributes and perform the following operations?
- Attribute Names: ST\_ROLLNO, ST\_NAME, ST\_STREET, ST\_CITY, ST\_State, ST\_Country, DTE\_REG, MARKS
- i. Insert 10 records
  - ii. Perform various Project Operations using Select Query.
  - iii. Perform various restrict operations using Select Query.
  - iv. Update & Delete records
  - v. Copy records from one Table STUDENT to other Table TEST? Assume both have same table structure
  - vi. Perform various restrict operations using Select Query using various arithmetic and Logical Operators like
    - a. Less Than
    - b. Greater Than
    - c. Less Than or Equal to
    - d. Greater Than or Equal To
    - e. Equal to
    - f. Not Equal To
  - vii. Perform Update /Delete/Insert /Select operations using various Arithmetic and Logical Operators on Table STUDENT

### Unit-II

Q1. Perform various DML operations to verify

1. Domain Constraints
  2. Validity Integrity
  3. Entity Integrity using Primary and Unique Keys
  4. Entity Integrity
  5. Referential Integrity
  6. Perform ON DELETE CASCADE and ON UPDATE CASCADE
  7. Create and Drop Constraints using alter command
- Q2. Perform the following join operations:
- i) Equi-Join
  - ii) Non Equi-Join
  - iii) Self-Join
  - iv) Outer Join
- Q3. Also Perform below Mentioned Operations on tables using above Data Integrity Constraints.

- i) Create System named Constraints and User Defined Constraints
- ii) Create Column and Table Level Constraints.
- iii) View User Constraints Table for checking Constraint Parameters.

### **Unit-III**

Q1. Create Users user1, user2, user3 and perform the following operations

- i. Grant Session Privilege to the newly created users?
- ii. Grant privileges for creating and manipulation tables?
- iii. Grant data manipulation privileges to various users on tables?
- iv. Grant/Revoke privileges with grant option.

Q2. Perform the following operations

- i. Create Five Save Points from S1 to S5.
- ii. Rollback to Various Save Points and observe the changes in the table.
- iii. Perform various DDL operations the table and observe its effect on Save Point and Rollback on the table
- iv. Try to abnormally terminate the application to observe whether data is saved or not.
- v. Use Commit and Commit Work commands to save the data permanently.

## Paper Title: Lab-IV for DCA21201

Paper Code: DCA21203

Credits: 03

Internals: 25

External: 50

### Unit-I

#### Q1. HTML5/CSS

- (i) Developing basic web page using different HTML5 formatting and layout tags
- (ii) Use forms and Tables
- (iii) Embedding Styles in a tag, with in a page (intra page), linking external CSS to a page
- (iv) Working with positions, floating, grouping and dimensions in CSS
- (v) Working with basic transformations and animations in CSS

### Unit-II

#### Q1. JAVA SCRIPT

- (i) Accessing different properties of a web page
- (ii) Validating form elements of a page
- (iii) Defining new functions
- (iv) Creating classes in JavaScript
- (v) Handling different events
- (vi) Handling events in JavaScript

#### Q2. JQUERY

- (i) Using Selectors
- (ii) Accessing form attributes/elements
- (iii) Traversing DOM

### Unit-III

#### Q1. PHP

- (i) Installing and configuring PHP
- (ii) Accessing form elements
- (iii) Defining new functions
- (iv) Creating/ destroying a session
- (v) Authenticating a user through session
- (vi) Including existing files
- (vii) Creating, deleting, reading and writing files
- (viii) Connecting to MySQL
- (ix) Accessing MySQL using PHP