CSJM University, Kanpur

Course: Diploma in Computer Applications
Duration: Two Semesters (each of six months period)
Proposed Syllabus to be effective from January, 2020 Batch

SL. No.	Paper Code	Paper Name	External Marks	Internal Marks	Total Marks
— Diploma in Computer Applications – First Semester					
1.	DCA-101	Fundamentals of Computer and Information Technology	70	30	100
2.	DCA-102	Computer Programming in 'C/C++'	70	30	100
3.	DCA-103	MS Office	70	30	100
4.	DCA-104	Application of Operating System	70	30	100
5.	DCA-105	Computer Lab (Based on Paper 2)	70	30	100
6.	DCA-106	Computer Lab (Based on paper 3 and 4)	70	30	100
Diploma in Computer Applications – Second Semester					
1.	DCA-201	Internet and Web Designing	70	30	100
2.	DCA-202	Relational Database Management System	70	30	100
3.	DCA-203	Computer Network	70	30	100
4.	DCA-204	Introduction to Software Engineering	70	30	100
5.	DCA-205	Computer Lab (Based on Paper 1)	70	30	100
6.	DCA-206	Computer Lab (Based on Paper 2 and 3)	70	30	100
7.	DCA-207	Project (Based on Paper 4)	--	--	100

FIRST SEMESTER

1. *Fundamentals of Computer and Information Technology*
2. *Computer Programming in 'C'*
3. *M.S. Office*
4. *Applications of Operating Systems*
5. *Computer Lab (based on paper 2)*
6. *Computer Lab (based on paper 3 and 4)*

1- FUNDAMENTALS OF COMPUTER AND INFORMATION TECHNOLOGY
[100 Marks]

Unit 1- Introduction: [20 Marks]

Characteristics and limitations of Computers, Evolution of Computers, Computer Generations, classification of computers on the basis of applications- Analog Computer, Digital Computer and Hybrid Computer, and on the basis of size – Micro computers, Workstations,

Mini Computers, Mainframe computers and Super Computers, Laptop, Notebook and Desktop Computers.

Unit 2- Basic Computer Organization: [30 Marks]

Block Diagram of computer system and functional units – Input unit, Output unit, Storage unit, Central processing unit(CPU), Arithmetic Logic Unit(ALU) and Control Unit(CU). Number Systems– Decimal System, Binary System, Octal System, and Hexadecimal System. Conversion from One number System to Another, Computer Codes– BCD Code, EBCDIC Code, ASCII Code, & Unicode. Main Memory- Introduction, Characteristics of Memory Devices, Random Access Memory(RAM), Dynamic RAM, Static RAM, Read Only Memory(ROM),CACHE Memory. Secondary Storage devices- Magnetic Disk, Hard Disk, Magnetic Tape, Floppy Disk, Winchester Disk, CD-ROM Disks.

Unit 3- Input/Output Devices: [30 Marks]

Introduction to I/O Devices, Input Devices-Key board Devices, Image Scanner, Optical Character Recognition(OMR), Bar-Code Reader, Optical Mark Reader(OMR), Digitizer, Electronic Card Reader, Speech Recognition Devices, Output Devices- Monitors, Printers, Impact Printers, Non Impact Printers, *Types of Printers, Dot Matrix Printers, Daisy Wheel Printers, Inkjet Printers, Laser Printers, Line Printers, Plotters.*

Unit 4- Multimedia: [20 Marks]

Introduction, Multimedia Computer System, Basic Elements of Multimedia- Text, Graphics, Animation, Audio, Video. Application of Multimedia in Entertainment and Marketing.

Books:

- ✓ Fundamentals of Computers by V. Rajaraman (Prentice Hall of India).
- ✓ D.S. Yadav, "Foundations of IT", New Age, Delhi
- ✓ Computer Fundamentals by P.K. Sinha(BPB).
- ✓ Computer Fundamentals- Architecture and Organisation by B.Ram (Wiley Eastern Limited)

2- COMPUTER PROGRAMMING IN 'C/C++': [100 Marks]

Introduction to programming, Data Types, Variables, Operators & Expressions, Control Statements, IF-ELSE, WHILE, FOR, DO-WHILE, Switch Case, Functions and Modular Programming, Scope of variables, Parameter passing, Recursion, Block Structure, Preprocessor Statements, Pointers & Arrays, Structures and Unions, Input and Output-*printf* function, *scanf* function, Thread, Class, Array, Inheritance, Polymorphism.

Books:

- ✓ "Magic with 'C' " AB Publication.
- ✓ C Programming: Schaum Outline Series.
- ✓ Let us C++ by Y.P. Kanetkar, BPB Publication.

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3- M.S. Office: [100 Marks]

Unit 1- MS-WORD: [30 Marks]

Fundamentals of MS-WORD, Typing and Editing, Formatting Text, Page design and Layout, Working with LONG Document.
File Management using MS-WORD in a workgroup, using MS-WORD with other Applications like Mail Marge.

Unit 2- MS-EXCEL: [30 Marks]

Fundamentals of MS-EXCEL, Worksheet formulas and links, creating Charts from Worksheet data, retrieving and analyzing data from lists and tables, statistical analysis Reviewing and sharing workbooks, Exchanging data with other Applications.

Unit 3- MS-ACCESS: [20 Marks]

Fundamentals of MS-ACCESS, Designing and Managing database, sharing data in a Multiuser environment, Importing & Exporting. of tables, Designing Selected Queries designing and Customizing forms & Reports, Macros.

Unit 4- MS-POWER POINT: [20 Marks]

An overview of POWER POINT, Creating Presentation of Slides, Adding Visuals and Sound to slide using power point with other Applications.

Books:

- ✓ My Office 2016 by Paul McFedries.
- ✓ Microsoft Office 2010(Kindle Edition) by Bittu Kumar.
- ✓ Microsoft Office 2016 by Lalit Mali, Notion Press Publication.

4- APPLICATIONS OF OPERATING SYSTEMS: [100 Marks]

Unit 1- OPERATING SYSTEM: [30 Marks]

Definition and need. Main Services of operating system, various types of operating system, (definition and characteristics), multitasking, multiprocessing, multiprogramming, real time, time sharing, parallel, network operating system, booting process, file system.

Unit 2- DISK OPERATING SYSTEMS (DOS): [20 Marks]

Introduction, History & versions of DOS, DOS basics-*Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files.* **DOS commands:** *Internal* - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc. *External Commands* - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc

Unit 3- WINDOWS: [30 Marks]

History of Windows, Introduction to Windows 8, The Windows 8 Interface, Input Options, Working With and Customizing Windows Settings, Customizing Windows 8, Searching with Windows 8, Accessibility Settings, Users, Privacy and security, Working With Apps, File Management, Settings for Sharing and Files, Managing People and Time.

Unit 4- LINUX: [20 Marks] - Linux introduction, Basic Features, Advantages, Features of Linux, *Basic Architecture of Unix/Linux system, Kernel, Shell, Linux File system, Linux standard directories.*

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Partitioning the Hard drive for Linux, Installing the Linux system, System, startup and shut-down process, How Linux works, Linux GUI, Linux Desktop, Creating files in Linux. Essential linux commands Understanding shells, Commands for files and directories cd, ls, cp, md, In, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces.

Books:
✓ **DOS Quick Reference** by Rajeev Mathur, Galgotia Publications
✓ Linux and Shell Programming -Sumitabha Das, Tata McGraw Hill Publications.
✓ Operating System Concepts & Design by Milan MilenKovic, TMH Publication

5- Computing Lab. Ist
Programming in C/C++
6- Computing Lab. IInd
PC Software and Operating System

SECOND SEMESTER

1. *Internet and Web Designing*
2. *Relational Database Management System*
3. *Computer Network*
4. *Introduction to Software Engineering*
5. *Computing Lab - I (DBMS)*
6. *Computing Lab - II (Web Designing)*
7. *Project*

1- INTERNET AND WEB DESIGNING: **[100 Marks]**

Unit 1- Introduction: [30 Marks]
Definition, Brief History, Its Basic Services, Evolution of Internet, ARPANET and History of World Wide Web, How Internet works? Uses of Internet, Impact of Internet on Society. Client Server Model, Hosts and Nodes, TCP/IP, Router, Packet Switching Technology, Internet Service Provider, Internet Addressing: Domain names, IP Addresses. File Transfer Protocol(FTP), Telnet and Usenet, News Services.
Introduction to Web Browsers, Basic features, Reading a web page, Printing and Saving a Web Page, Web Services, Search Engines: Google (www.google.com, Yahoo (www.yahoo.com), HotBot (www.hotbot.com), Searching Criteria.
Unit 2- E-Mail Basics: [30 Marks]
*E-Mail System, Advantages and Concerns of E-Mail, E-Mail Protocols – SMTP, POP3, IMAP4, How to access the E-Mail System, E-Mail Addresses. **Overview of Internet Security**, Firewalls, Internet Security Management Concepts.*
Unit 3- Introduction to Web Page Design: [40 Marks]
HTML- An Overview, Elements of HTML, Syntax, Creating and Customizing HTML text, Images, Basic Structure of HTML document

using Graphics in HTML, HTML Categories, Using lists in HTML, Ordered and Unordered lists, Changing list style. Creating a Table, Captions, Table Header and Table Data, An Event Calendar, Creating Forms, Text Fields and Attributes, The <Frame> Tag, A simple Frame Document, Attributes of <Frame>, The <Noframe> tag, External and Internal Links, URL Anatomy, Types of URLs, Creating Graphical Links, Style Sheets.

Books:
- ✓ Web Technology & Design B-C. Xavier, New Delhi Age International
- ✓ Advance Programming inWEB Design By V.K.Jain, Cyber Tech. Publication.
- ✓ Internet Book-Comer,PHI

2- RELATIONAL DATABASE MANAGEMENT SYSTEM: [100 Marks]

Unit 1- Basic Concepts: [20 Marks]
Data Modeling for database, Abstraction and data integration. Three-Level Architecture proposal of DBMS, Component of DBMS

Unit 2- Data Models: [20 Marks]
Data model classification, Entity relationship Model, Relational Data Model, Hierarchical Data Model, Network Data Model. Normalization, Normal Forms.

Unit 3- Relational Database Management System (RDBMS): [20 Marks]
Functions, Relational Algebra, Maintaining Databases, Implementing indexes, Entity, Domain, Attribute, Designing a Database using E-R Diagram. Identifying Keys in Database Tables.

Unit 4- Structure Query Language (MySQL): [40 Marks]
MySQL Operators, Common Data Types, Data Definition Commands of MySQL, Data Manipulation Commands of MySQL. Aggregate Functions, Creating Views, Database Access Methods, Simple Query, Sub Query. Security consideration in Database Management System.

Books:
- ✓ Database Management: Objective, System Function & Administration-Everest(TMH).
- ✓ Bipin Desai, "An Introduction to Database System", Galgotia Publication, New Delhi.
- ✓ Korth, "Database and its Concept", TMH.

3- COMPUTER NETWORK: [100 Marks]

Unit 1 - Introduction: [30 Marks]
introduction to Computer Network, Need for Networking, Nodes, Links, Connectivity, Data Transmission Modes, Data Transmission Speed. **Data Transmission Media-** Twisted Pair Wire, Coaxial Cable, Microwave System, Optical Fibers. Digital and Analog Data Transmission, Modulation Techniques, Multiplexing Techniques.

Switching Techniques- Circuit Switching, Message Switching, Packet Switching. Routing Techniques, Network Topologies- Star Network, Ring Network, Hybrid Network.

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Unit 2 - Network Types-[30 Marks] PAN, LAN, MAN and WAN, according to configuration Client/server and Peer to Peer, Communication Protocols- *Roles of Communication Protocol, Layered Protocols, Network Interface Card (NIC).* **Application Protocols -** *Client/Server Model, Network File System (NFS), Remote Login: Telnet; File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP); E-mail system: Simple Mail Transfer Protocol (SMTP), Post Office Protocol (POP); World Wide Web (WWW), Domain Name System (DNS), DNS servers.*

Unit 3 - Types of Communication- [30 Marks] Simplex, Half-Duplex, Full-Duplex. **Types of Network Address-** Class A, Class B, Class C and Subnet Mask. **OSI Model-** Physical Layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer and Application Layer. **Types of Modem & speed-** Internal and External Modem, Baud rate. **Network expansion devices-**Router, Repeater, Hub, Gateway, Bridge.

Unit 4 - Wireless Networks – [10 Marks] *Radio Communications* **Security and Management** - *Cryptography, IPsec, SSL/TLS, PGP, secure HTTP, proxy, firewall.*

4- INTRODUCTION TO SOFTWARE ENGINEERING: [100 Marks]

Introduction to Software Engineering, Software Products, Software Engineering Environment, Professional Responsibility, Software Processes, Computer – based System Engineering, System Development Life Cycle

Project Management: Management Activities, Project Planning, Project Scheduling

Software Requirements Software Requirements, Requirements Engineering, System Models, Software Prototyping

Software Design Software Design Process, Software Design Principles, User Interface Design, Design with Reuse Architectural Design

Implementation and Maintenance Programming Languages, Software Reliability, Risk Reduction, Safety Assurance, Software Maintenance, Software Re-engineering

Verification and Validation Verification vs. Validation, Software Testing, Fundamentals, Testing Process, Testing Strategies, Version and Release Management

Software Quality and Quality Assurance Software Quality Assurance, Planning, Software Quality Assurance, Process Software, Quality Attributes, Guidelines and Check lists Software Safety

Software Cost Estimation Equipment Cost, Maintenance Cost, Staffing Cost.

Books:
✓ Software Engineering by K.K. Aggarwal & Yogesh Singh, New Age International Publication.
✓ Advanced Software Engineering by Dr. Ikvenderpal Singh, Khanna Book Publishing; First Edition (2014).
✓ Software Engineering: A Practitioner's Approach by Roger S Pressman, McGraw Hill Education Publication.

5- Computing Lab – I
   DBMS
6- Computing Lab - II
   Web Designing
7- Project
   To develop a software package Based on the topics covered in D.C.A.