



AWADHESH PRATAP SINGH UNIVERSITY  
REWA (M.P.) 486003

CBCS  
CURRICULAM & SYLLABUS

**POST GRADUCATE DIPLOMA IN  
COMPUTER SCIENCE & APPLICATION (PGDCA)**

(ONE YEAR TWO SEMESTERS)

**(UGC Approved)**

Course Code: 05

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Approved by Board of studies dated 21-09-2020

**A.P.S. UNIVERSITY, REWA (MP)**  
**POST GRADUATE DIPLOMA IN COMPUTER SCIENCE &**  
**APPLICATION (PGDCA)**

**SCHEME OF EXAMINATION (w.e.f. session 2020-21)**

**PGDCA Semester -I**

Paper Code	Course Code	Paper Name	Course Type	Credits	Theory Paper	Internal Assessment	Maximum Marks
1051	PGDCA -101	Computer Fundamentals	CC	04	60	40	100
10521 10522	PGDCA -102	<b>Elective I:: (Any one of the following considering departmental constraints)</b> (A) Programming in C (B) Multimedia Application	DCE	04	60	40	100
10531 10532	PGDCA -103	<b>Elective II:: (Any one of the following considering departmental constraints)</b> (A) Analysis and Design of Information System (B) E-Commerce and E-Governance	DCE	04	60	40	100
1054	PGDCA -104	Office Automation S/W Tools*	GE	04	60	40	100
1055	PGDCA-105	Software Lab I (Problem based on Paper 102)	Lab	02	60	40	100
1056	PGDCA-106	Software Lab II (Problem based on Paper 101 & 104)	Lab	02	60	40	100
1057	PGDCA-107	Comprehensive Viva/ Project	Viva	04			100
		<b>Semester Total</b>		<b>24</b>			<b>700</b>

**PGDCA Semester – II**

Paper Code	Course Code	Paper Name	Course Type	Credits	Theory Paper	Internal Assessment	Maximum Marks
20511 20512	PGDCA-201	<b>Elective III:: (Any one of the following considering departmental constraints)</b> (A) JAVA Programming (B) Web Technology	DEC	04	60	40	100
20521 20522	PGDCA-202	<b>Elective IV:: (Any one of the following considering departmental constraints)</b> (A) Computer Networks (B) Big Data Analysis	DCE	04	60	40	100
2053	PGDCA-203	DBMS*	GE	04	60	40	100
2054	PGDCA-204	Software Lab I (Problem based on 201)	Lab	02	60	40	100
2055	PGDCA-205	Software Lab II (Problem based on 203)	Lab	02	60	40	100
2056	PGDCA-206	Application Project	Project	04			100
2057	PGDCA-207	Comprehensive Viva	Viva	04			100
		<b>Semester Total</b>		<b>24</b>			<b>700</b>

**CC: Core Course GE: Generic Elective DCE: Discipline Centric Elective**

\* Student may choose this course as a Generic Elective or may choose a Generic Elective Course Offered in other UTDs at the same level or may choose a course offered by MOOCs through SWAYAM

Approved by Board of studies dated 21-09-2020

## **OBJECTIVES:**

Post Graduate Diploma in Computer Applications (PGDCA) is designed for graduate students who are seeking professional knowledge in computer applications and are keen to equip the students with requisite knowledge, skills and right attitude necessary for becoming efficient Computer / IT Professionals. This course is useful for students who want to learn computer applications in different fields like banking, insurance, government sectors and accounting. This programme covers a blend of computer subjects like programming languages, data base management, systems analysis, Operating system, PC packages and computer software development in specific applications.

The main objectives of the programme are:

- To gain practical, hands-on experience in computer applications and tools playing a significant role in business, banking and government sectors.
- To make sustained efforts for holistic development of the students and empower them to analyze, develop, configure IT solutions keeping in view the challenges posed by changing IT requirements.
- To develop competent computer management professionals with strong ethical values

## **ELIGIBILITY:**

Every candidate seeking admission to the program shall have Bachelors Degree or a Post-Graduate Degree with at least 45% marks from any statutory University.

OR

Candidates who do not possess requisite eligibility at the time of application but plan to appear in the final year of a degree examination may also apply. However, such candidates can be provisionally considered only upto a specified date notified by the University.

**Age Limit:** No Upper Age Limit. As per State Government norms.

## **Admission Procedure:**

The admissions will be done as per merit in the entrance test conducted by the university

**Seats:** 60 (reservation as per state Govt. rules).

## **About the Department of Computer Science & Applications:**

The Department of Computer Science and Applications was established in the year 1990 with the aim of developing professionals in main stream of Computer Science and Applications. The Department offers PhD and Postgraduate degree courses through UTD. The Department studies market trends and new developments in the area, conducts massive brainstorming with leading academia and industry professionals to develop the curricula.

The Department is committed to provide excellence in teaching. It has a rich knowledge

pool of well-trained faculty and a modern computer lab enabled to impart all required knowledge, along with its own library with latest books on various advanced areas in computers. Regular hands-on workshops are conducted to update students with the latest technology.

Between 2005 to 2010 Department had also run M.Sc. Bioinformatics/ APGDBI Course with partial financial support from UGC Innovative Program & DBT BIF scheme, which in subsequent years were suspended due to financial crunch/ decline in no. of students.

Many of the alumni are working in top companies including IBM, MicroSoft, American Express Bank, Wipro, Infosys, Samsung, Microsoft, WorldPay, CISCO, HCL, Jindal, Web Dunia and more in India as well as abroad, apart from few also being entrepreneurs and some other, in academics with prestigious institutions.

### **Program Objectives:**

- To empower students with basic skills of various technologies.
- To develop the ability to identify, analyze, formulate and develop computer applications.
- To enable the students to select modern computing tools and techniques and use them with dexterity.
- If you are looking for challenging roles in the IT industry, computer science research, web and mobile development, data analysis, information security etc., this programme is for you.

### **Career Path after Completing the Programme:**

- Software Developer Programmer
- Systems Analyst
- Computer Support Engineer
- Database Administrator
- Systems Administrator
- Web Designer & Developer
- Network Administrator
- Data Entry Operator

### **PROGRAMME OUTCOME**

**PO 1- Critical Thinking:** Take informed actions after identifying the assumptions that frame our thinking and actions, check out the degree to which these assumptions are accurate and valid, and look at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**PO 2- Effective Communication:** Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

**PO 3- Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings.

**PO 4- Effective Citizenship:** Demonstrate empathetic social concern and equity-centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

**PO-5 Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

**PO-6 Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.

**PO-7 Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

## **PROGRAMME SPECIFIC OUTCOME**

**PSO-1** Enrich the knowledge in the areas like Artificial Intelligence, Web Technology, Paradigm of Programming language, Design and Analysis of Algorithms, Database Technologies, Operating System, Software Project Management and core computing subjects. Choose to study any one subject among recent trends in IT provided in the optional subjects.

**PSO-2** Research oriented study, including basic history of science, the fundamentals of scientific writing, how to give a scientific talk, how to evaluate a scientific paper, and research ethics. Aware them to publish their work in reputed journals.

**PSO-3** Provide opportunities to excel in academics, research or Industry. Get industrial exposure through the 6 months Industrial Internship in IT industry. Students understand all dimensions of the concepts of software application and projects. Developed in-house applications in terms of projects. Interact with IT experts & knowledge by IT visits.

**PSO-4** To make them employable according to current demand of IT Industry and responsible citizen.

## SEMESTER I

### PGDCA101- COMPUTER FUNDAMENTALS

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#### **Course Objectives:**

- Identify all the parts and main functions of computers.
- Acquaint the students with the applications of computers and understanding latest trends in information technology.
- Learn Basics of software Systems and Linux operating systems

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#### **Course Outcomes:**

- Use and identify various art (input output devices) of computer system.
- Explain functions of various parts and function of computer.
- Use Linux operating system and create files and folders.
- Explain Software Hardware Components of Computer system.

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#### **Unit-wise Syllabus :**

##### **Unit -I**

Introduction to computers: Evolution, Characteristics & Capabilities: Classification: Analog, Hybrid, Digital, Micro, Mini, Main and Super, Components of Computer System, Block Diagram, Input Devices, Output Devices, CPU, Only preliminary concept of software, Hardware, Low level Language, High level Language, Compiler and Interpreter, Preliminary idea of Multimedia computers and associated basic components.

##### **Unit-II**

Number System: Introduction to decimal, binary, Octal, Hexa Decimal Number Systems and their interventions: Coding: (ASCII, EBCDIC, BCD), Introduction to Primary Memories (RAM, ROM, PROM and EPROM), Preliminary concept of Extended, Expanded and virtual Memory, Registers, Counters, Storage Devices: Hard Disks, Floppy disks (sector, cylinder, track, seek, time, latency and response time)

##### **Unit -III**

Introduction to Operating Systems: Definition, function, Evolution: (Only preliminary idea of terms: Batch processing, multiprogramming, multiprocessing, multitasking, time sharing, on-line processing, real time and some popular operating Systems for PC's): Introduction to DOS: Internal Commands, external commands (Tree, Diskcopy, Undelete, chkdsk, Fdisk, Backup, Restore, Format, Unformat, Attrib, Xcopy, Diskcomp): Concept of wild cards, batch files, config files, filtering, piping and redirection.

##### **Unit -IV**

Unix: Structure of UNIX system, Kernel, Unix file system: Concept of files and directories : File Oriented Commands like cat, cp, grep, pwd, chmod, mv, rm, pg, passwd, bc; File permissions, Directory oriented commands like ls, mkdir, inter-user communication commands like write, mail, mesg, General utilities commands like echo, cut, passwd, kill, date, we, sleep, who, ps, Introduction to vi editor.

##### **Unit -V**

Windows: Introduction, windows desktop, start button, taskbar, switching between programs and windows, managing files, folders and objects, windows explorer, creating shortcuts, control panel, windows accessories:- paintbrush, WordPad, customizing windows, sharing information among applications, network neighborhood, sharing folders and printers, Internet Explorer.

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#### **REFERENCE BOOKS:**

- 1 Jain Satish: Introduction to Computer Science, BPB
- 2 Sinha, P.K.: Computer Fundamental, BPB
- 3 Thomas R: Dos 6 and 6.2 Instant reference, BPB
- 4 Koparker, P. K.: UNIX for you, TMH
- 5 Alan Simpson's: Easy Guide to Windows, BPB
- 6 Yashwant Kanetkar "Unix Shell Programming" BPB Publications

## PGDCA102 (A) -PROGRAMMING IN C

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### ***Course Objectives:***

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- To Make the Student Learn C Programming Language.
  - To Learn Problem Solving Techniques using C.
  - To Teach the Student to Write Programs in C and to Solve the Problems.
  - To Teach the Concepts of C Programming Like Control Structures Functions Learn About Arrays Structures and Union etc.
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### ***Course Expected Outcome:***

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- Explain the Basic Terminology Used in Computer Programming.
  - Explain the Process of Problem Solving Using C Programming Language.
  - Write Compile and Debug Programs in C Language.
  - Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language.
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### ***Unit-wise Syllabus :***

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#### **UNIT-I**

C Language Programming: Principal of good programming (flowchart, algorithm), Introduction to C language: The structure of a simple program: Simple I/O functions (Scanf, printf, gets, puts, getchar, getch). Use of semicolon, braces, parentheses, Comments and newline character: Data types in C, Assignment statement, Arithmetic, Relational & Logical operators: Conditional operators, Precedence of operators.

#### **UNIT- II**

Control Structure: The if-else statements, nesting of if-else, switch statement, Loops: while and do-while, the for loop, Functions: User defined functions, Returning a value from a function, Local and Global variables, Storage classes, Parameters, Type declaration of a function, Functions with more than one parameters, Prototype of a function.

#### **UNIT- III**

Arrays: Declaration and Initialization, the break and continue statement, String and Character arrays, operations with arrays, searching in array (linear and binary), Sorting an array (Bubble, Selection and Insertion). String & String functions: sprintf, strcpy, scanf, strcat, strlen, malloc, sizeof, strcmp.

#### **UNIT- IV**

Pointers: The concept of pointers, passing pointers as parameters, arrays of pointers, Pointer to pointers, Array of pointers to string, Sorting an array, using pointers, Structure: The concept of structure, Initializing, Arrays of structures, Arrays within structures, Structures within Structures. Passing structures to function, unions, basic graphics functions in Turbo C.

#### **UNIT- V**

Files: Files in C, Modes for files; Functions used in files (getc, putc, fopen, fclose, fscanf, fread, fwrite, fprintf, fseek, ftell, rewind). Text vs binary files, The C Preprocessor: Preliminaries of C Preprocessor Directives (#define, #undef, #include, #ifdef, #ifndef, #endif, #else, #if), Bitwise Operators.

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### ***Reference Books:***

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1. Gottfried, Programming with C. TMH
2. Rajaraman, Introduction to C, PHI
3. Kerningham & Ritchie "The C Programming Language" PHI
4. Schildt "C: the Complete Reference" 4th Ed. TMH.
5. Kanetkar Y. "Let Us C" BPB.
6. Kanetkar Y. "Exploring in C", BPB.

## PGDCA102 (B) - MULTIMEDIA APPLICATION

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### *Course Objectives:*

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- To Provide Students with a Basic Understanding of Multimedia Systems and its Components. This Course Focuses on Topics in Multimedia Information Representation and Multimedia Standards in the Components of Multimedia – Text, Audio, Image, Video and Animation.
- To Provide Information about the Standards Tools and Techniques Used in Development of Multimedia Components for Productions
- To Create Simple Multimedia Applications and Products for Using Standalone, Networked Or Web Based Computers.

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### *Course Outcomes:*

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- Develop Understanding of Technical Aspect of Multimedia Systems.
- Understand and explain the storage mechanism and applicability of Various File Formats for Audio, Video and Text Media.
- Develop Various Multimedia Systems Applicable in Real Time.
- Create a Multimedia Component Using Various Tools and Techniques.
- Apply the Guidelines and Standards of Multimedia Systems and to Analyze the performance of Multimedia System.

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### *Unit-wise Syllabus :*

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#### **UNIT-I**

Introduction to Multimedia, Needs and Areas of use, Development Platforms for Multimedia Identifying Multimedia Elements Text, Images, Sound, Animation and Video, Making Simple Multimedia with PowerPoint.

Concepts of Plain & Formatted Text, RTF& HTML Texts, Using Common Text Preparation Tools, Conversion to and from of Various Text Formats, Using Standard Software, Object Linking and Embedding Concept.

#### **UNIT-II**

Sound - Sound and its Attributes, Sound and its Effects in Multimedia, Frequency, Sound Depth, Channels and its Effects on Quality and Storage, Size Estimation of Space of a Sound File, Sound Card Standard – FM Synthesis Cards, Waves Table Cards, Midi and MP3 Files and Devices, 3D Sounds, Recording and Editing Sound Using Sound Editors Like Audacity, Sound Forge etc.

Importance of Images Graphics in Multimedia, Vector and Raster Graphics, Regular Graphics Vs. Interlaced Graphics, Image Capturing Methods - Scanner, Digital Camera etc. Color Models-RGB, CYMK, HUE, Saturation, and Brightness, Various Attributes of Images Size, Color, Depth etc, Various Image File Format BMP, DIB, CIF, PIC, and TIF Format Their Features and Limitations, Image Format Conversion, Various Effects on Images. Create Images Using Photoshop, Corel draw and Apply Various Effects, Using Layers, Channels and Masks in Images.

#### **UNIT-III**

Video- Basic of Video, Analog and Digital Video Type of Video, Digitization of Analog Video, Video Standard – NTSC, PAL, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, JPG, MPEG, Video Editing and Movie Making Tools, Converting Formats of Videos, Recording and Editing Videos Using Video Editing Software Like Adobe Premiere or Sony Vegas.



#### **UNIT-IV**

Animation and its Basic – Principals of Animation and its use in Multimedia, Computer System Configuration and Peripherals Requirements, Software for Animation, Effects of Resolution, Pixel Depth, Image Size, on Quality and Storage, Types of Animation and Applications.

Authoring Tools for Multimedia – Introduction to Various Types of Multimedia Authoring Tools, CD/DVD Based and Web Based Tools, Features and Limitations, Creating Multimedia Package Using All Components.

#### **UNIT-V**

Introduction to Virtual Reality and its Applications, Virtual Reality Terminology Head Mounts Display (HMD), Boom, Cave, Input Devices and Sensual Technology, Characteristic If Immersive vs. Shared, Augmented and Mixed Reality

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#### ***Reference Books:***

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- 1 Ramesh Bangia-Introduction to Multimedia-Laxmi Publications Pvt. Ltd.
- 2 Tay Vaughan-Multimedia: Making It Work,TataMc-Graw Hill.
- 3 Bhatnager G. Elsevie-,Introduction to Multimedia Systems,
- 4 Satish Jain O Level Introduction to Multimedia (M4.2-R4), BPB Publications.

## PGDCA 103(A) ANALYSIS AND DESIGN OF INFORMATION SYSTEM

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### *Course Objectives:*

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- Understand System Characteristics, Components, Managing Projects, Prototyping.
  - Introduce Established and Evolving Methodologies for the Analysis, Design, and Development of an Information System.
  - Understand and Learn System Development Life Cycle (SDLC) Phases.
  - Learn and Apply the Universal Modeling Language (UML) to Model the System.
  - Learn and Inculcate the Technical and Soft Skills Required to System Analysts for Broad Understandings Policies, Culture, Operations and Business Processes of the Organization
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### *Course Outcomes:*

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- Explain the Characteristics, Components, Activities of SDLC, Models of Information Systems, Types of Information Systems and Benefits of Various Information Systems
  - Identify, Analyze, Review and Validate the Requirement of Information System and Also Prepare System Requirement Specification (SRS) Document.
  - Design, Develop/Implement, Deploy and Evolve the Efficient, Reliable, Robust, and Cost Effective Information System.
  - Apply Universal Modeling Language (UML) to Analyze and Model the Solutions of Information System Problems
  - Work Effectively in Various Roles of System Analyst Such as Problem Investigator, Communicators, System Designer, Tester, Project Manager and Maintenance Engineer.
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### *Unit-wise Syllabus:*

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#### **UNIT-I**

Organizational Foundation of IS: Historical Evolution of Information system. The complete Business Environment. Advantages of Using Computerized information System (IS) Six major types of Information System. The changing matter of Information Technology, Challenges of Information systems, Relationship between Organisation and Information systems. Salient Features of Organization and management. Classical Model. Behavioral Model and Decision Model. Levels and types of Decision Making. System Approach Theory. Management Challenges. Ethical and Social Impact of Information System.

#### **UNIT-II**

Technical Foundation of Information System: Charting Techniques. Structured Analysis and Design. Decision Tree. Decision Table. DFD. Data Dictionary. Information System Software Tools and Approaches: Advantages and disadvantages of using IS Software tools. Idea of Object Oriented Programming. CASE tool, PERT & CPM. Recent Database Management trends. Distributed Databases: Object Oriented and Hypermedia Database, Telecommunications. The Internet.

#### **UNIT-III**

Building Information System Traditional System Development Life Cycle (SDLC). Analysis: Problem Identification. Fact Gathering, Fact Analysis, Feasibility Study, Feasibility report. Design, Physical and Logical Design. File Design. I/o Design, Database Design. Limitation of traditional life cycle approach. Prototyping, Outsourcing information system. A Typical Case Studies of Information System.

#### **UNIT-IV**

Implementation: Managing and Controlling of Information System. testing, training, conversion. Post Implementation phase. Ensuring quality with IS. Traditional tool & methodology for quality assurance. New approaches to quality assurance. Measuring Information System Success. Areas of Problem in Information System. Causes of Information system Success and Failure. Controlling Risk Factor. Auditing Information

System.

**UNIT-V**

Management and Organizational Support Systems: Knowledge Work System. Decision Support System (DSS). Group Decision Support System (GDSS). Executive Support System (ESS). Artificial Intelligence (AI). Expert System. Neural Network. Growth of International Information System. Main Technological Issues: Merger of International Technology and Infrastructure.

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***Reference Books:***

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1. Laudon C. Kenneth & Laudon P. Jane: Management Information System: Organization Technique. PHI.
2. Awad E. M.: Systems Analysis and Design. Galgotia Pub.
3. Murdic. Ross. Clagett : Information Systems for Modern Management.
4. PHI Bhatnagar S. C.: Computer & Information Management. PHI.

## **PGDCA-103(B) E-COMMERCE AND E-GOVERNANCE**

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### ***Course Objectives:***

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- To Develop Skills in Understanding Strategic Issues Related to E- Commerce and E- Governance
  - To Develop a Broad Knowledge of E-Governance and E-Commerce Activities in India
  - To Understand the Electronic Payment Systems
  - To Develop Knowledge of How the Government May Contribute in Moving the Country Towards E-Commerce and E- Governance
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### ***Course Outcome:***

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- Explain and demonstrate E-Governance Initiatives at the National Level in India
  - Make Classification of E-Commerce and E- Governance
  - Students Able to Think Critically and Analytically to New Successful Business Ideas.
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### ***Unit-wise Syllabus :***

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#### **UNIT-I**

Introduction to E-Commerce: Definition, History of E-Commerce, E-Business Models B2B, B2C, C2C, C2B, Environment of E-Commerce, Dimensions of E-Commerce, Ethical Issues, Electronic Data Interchange, Value Chain and Supply Chain, E-Commerce Marketing, E-Commerce Strategy, E-Commerce Infrastructure, Advantages and Disadvantages of E-Commerce.

#### **UNIT- II**

Electronic Payment Systems: Payment Gateways, Payment Cards, Credit Cards, Debit Cards, Smart Cards, E-Credit Accounts, E-Money, Marketing on the Web, Categories of E-Commerce, Edi, Marketing Strategies, Advertising on the Web, Customer Service and Support, Internet Banking, Introduction to M-Commerce, Case Study: E-Commerce in Passenger Air Transport, Element of E-Commerce, Issues of E-Commerce

#### **UNIT- III**

E-Government, Theoretical Background of E-Governance, Issues in E -Governance Applications, Evolution of E-Governance, its Scope and Content, Benefits and Reasons for the Introduction of E-Governance, E-Governance Models - Broadcasting, Critical Flow, Comparative Analysis, Mobilization and Lobbying, Interactive Services / G2C,C2G

#### **UNIT- IV**

E-Readiness, E-Government Readiness, E- Framework, Step & Issues, Application of Data Warehousing and Data Mining in E-Government, Case Studies: NICNET-Role of Nationwide Networking in E-Governance, E-Seva. Origins in India E-Governance Projects in India Measures to Be Considered Before Going for E-Governance, Work plan and Infrastructure

#### **UNIT- V**

E-Government Systems Security: Challenges and Approach to Security of E-Government, Security Concern in E-Commerce, Security for Server Computers, Communication Channel Security, Security for Client Computers. E-Security Network and Web Site Risk for E-Business, Information Technology ACT 2000 and its Highlights Related to E-Commerce, E-Security, Firewalls, Electronic Market / E- Shop, Introduction to Security, Types of Securities, Security Tools, Network Security.

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### ***Reference Books***

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1. Gary P. Schneider, "E-Commerce", Cengage Learning India.
  2. C.S.R. Prabhu, "E-Governance: Concept and Case Study", PHI Learning Private Limited.
  3. P. Tjoseph, S.J., "E-Commerce an Indian Perspective", Prentice-Hall of India.
  4. V. Rajaramn, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
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## PGDCA-104 OFFICE AUTOMATION S/W TOOLS

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### *Course Objectives:*

- To provide an in-Depth Training in use of office Automation Packages.
- To Understand the Basics of Windows Operating Systems
- To Understand How to use Software Packages in Day to Day Activities

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### *Course Outcome:*

- Creating Word Documents for office use Knowledge of Mail Merge.
- Use of Formatting Techniques and Presentation Styles.
- Provide Professional Services to the Society.
- Create Presentation Using Animation and Transition and other features.
- Construct Formulas Including the use of Built-in Functions and Relative and Absolute References and Create and Modify Charts and Preview and Print Worksheets.

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### *Unit-wise Syllabus :*

#### **UNIT – I**

Office Packages-Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS Office, Lotus Office, Star Office, Open Office etc. MS Word Basics: Introduction to MS Office; Introduction to MSWord; Features & area of use. Working with MS word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options.

#### **UNIT-II**

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto texts, Symbols etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding references and Graphics; Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats, an overview of Google Doc.

#### **UNIT-III**

MS Excel: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options, an overview of Google sheet.

#### **UNIT-IV**

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options. Outlook Express: Features and uses, Configuring and using Outlook Express for accessing e-mails in office, an overview of Google Slide.

**UNIT-V**

MS ACCESS: Creating of databases. tables, forms, reports & queries, use of macro & modules, creating of relationships among tables, generating simple queries using databases. MS-Access with other applications and Internet, sharing data between applications, Administering & securing a database. an overview of Google Form.

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***Reference Books:***

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1. Mansfield R: The Compact Guide to MS-OFFICE, BPB
2. Murray: Mastering Poser Point 6.0 for Windows, BPB
3. Cowart: ABC's of MS-ACCESS, BPB
4. Ms Office XP Complete BPB Publication

## PGDCA-105 Software LAB I (Problem based on Paper 102)

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### Course Objectives:

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- To Provide the Knowledge of Programming Language to Students.
- To Prepare Students for Role of Professional Programmers.
- To Learn About Programming Methodology, Concepts of C Programming Like Control Structures, Functions, Learn About Arrays, Structures, and Union etc.

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### Course Outcome:

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- Analyze the Problem and Write, Compile and Execute the Program and Verify the Outcome
- Explain and apply a Various features of IDE of C / C++ Compiler .
- Read, Understand and Trace the Execution of Programs Written in C language.
- Write the C Code for a Given Algorithm Using Coding Guidelines .
- Implement Programs with Pointers and Arrays to Manage the Memory.

### C Programming Lab:

- 1 Write a Program in C to Calculate Simple Interest When the Values of Principal, Rate and Time are given.
- 2 Write a Program in C to Calculate Area of a Circle When its Radius is Input from Keyboard.
- 3 Write a Program in C to Calculate Temperature in Centigrade When Temperature in Fahrenheit is Input from Keyboard.
- 4 Write a Program in C to Calculate Area of a Triangle When its Three Sides are Input from Keyboard (by Hero's Formula).
- 5 Write a Program in C to Determine Whether an Input Year is Leap Year Or Not.
- 6 Write a Program in C to Display the Table of a Number Input from Keyboard in the Following Format:  
N X 1 = N  
Eg: 5 X 1 = 5  
i. 5 X 2 = 10
- 7 Write a Program in C to Display the Table of Tables from 1 to 10.
- 8 Write a Program in C to Display the Following Patterns
- 9 Write a Program to Calculate the Factorial of a Number Input from Keyboard Using Recursive Method.
- 10 Write a Program in C to Show How to Pass an Array to a User Defined Function.
- 11 Write a Program in C to Display Largest Element of an Array When the Elements of the Array are Input from Keyboard.
- 12 Write a Program in C to Calculate Area of a Circle in a User Defined Function.
- 13 Write a Program in C to Swap Two Numbers Using Call By Value and Call By Address.
- 14 Write a Program in C to Show How to Pass an Structure to a User Defined Function.
- 15 Write a Program in C to Show How to Pass an Structure to a User Defined Function.
- 16 Write a Program to Calculate Total Marks, Percentage and Grade of a Student. Marks Obtained in Each of the Five Subjects are to Be Input by the User. Assign Grades According to the Following Criteria:  
a. Grade a: Percentage  $\geq 80$                       Grade B: Percentage  $\geq 70$  and  $< 80$   
b. Grade C: Percentage  $\geq 60$  and  $< 70$               Grade D: Percentage  $\geq 40$  and  $< 60$   
c. Grade E: Percentage  $< 40$
- 17 Write a Menu-Driven Program, Using User-Defined Functions to Find the Area of Rectangle, Square, Circle and Triangle by Accepting Suitable Input Parameters from User.
- 18 Write a Program in C to Display the First N Terms of Fibonacci Series.
- 19 Write a Program in C to Calculate the Sum of Two Compatible Matrices.
- 20 Write a Program in C to Calculate the Product of Two Compatible Matrices.

## PGDCA-106- Software LAB II (Problem based on Paper 101 & 104)

### Course Objectives:

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- To Provide the Knowledge of Microsoft Office Package.
- To Prepare Students to make use of Ms-Office Package Professionally.
- To Learn About Word Processing, Ms Excel, Power Point Presentation etc.

### Course Objectives

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- Use Microsoft Office Programs to Create Personal, Academic and Business Documents Using Current Professional and/or Industry Standards.
- Perform Calculations in Microsoft Excel Using Formulas and Built-in Functions.
- Prepare Datasheet and Graphs to Describe and analyze the Data in Microsoft Excel.
- Create Effective Presentation Using Various Features of Ms PowerPoint

### Experiment on Windows

- 1 Starting the Windows, Starting a Program, Running a Program Running Multiple Programs and Switching Between Windows, Customizing the Task Bar Recycle Bin, Restoring the Deleted Files
- 2 Creating and Removing Folders, Making the Taskbar Wider, Arranging Icons on the Desktop Displaying and Hiding the Taskbar Clock, Controlling the Size of Start Menu Options, Creating Shortcuts.
- 3 Installing a Screen Saver, Assigning a Wallpaper to Desktop, Adding a Program to the Start Menu, Adding a Program Shortcut in the Desktop, Customizing the Mouse Settings. Expanding and Collapsing a Folder, Recognizing File Types Using Icons, Running a Program from Explorer, Renaming a File or Folder, Sorting a Folder
- 4 Displaying the Properties for a File or Folder, Using Cut and Paste Operations to Move a File Using Copy and Paste Operations to Copy a File, Moving and Copying Files with Mouse, Searching a File or Folder by Using Search Command, Finding a File or Folder, by Name Defragmenting the Disk, Using Disk Defragmenter, Controlling the Speaker Volume Recording and Saving an Audio File, Connecting a Printer to the Pc

### Experiment on Word Processing:

- 1 Type the Following Paragraph as Given.

“My Dream Career”

My Ambition of Life is to Become a Doctor. I Have Taken Up Science and Hygiene as Optional Subjects. When I Joint College, I Shall Take UP Medical Group. I Shall Appear in the P.M.T. Examination to Qualify for Joining a Medical College. After Passing the P.M.T., I Shall Join the Medical College to Become a Doctor.

I Would Like to Be a Doctor. My Country Has Become Free from Diseases, Government Has Decided to Uproot the Diseases from the Country and Improve the Health of the People. Hospitals are Being Opened for This Purpose. There is Great Demand for Doctor. Taking All These Things into Consideration I Have Made Up Mind to Become a Doctor.

I Do Not Want to Be Clerk. This Line Does Not Suit Me. I Do Not Want to Be a Teacher. Law is Not a Paying Profession These Days So Becoming Lawyer is Not My Goal.

2. Correct any Spelling Errors Displayed in the Given Text.
3. Save the Document as <My Dream >\_W01.
4. Change the Layout of the Page as Given Below.



>Page Size: A4 (8.27" X 11.69") >Page Orientation: Landscape.  
5. Change the Page Margins as Follows:

>Top: 1.25">Bottom: 1.25">Right: 1.25">Left: 1.25"

6. Format the Entire Document as Given Below.

>Line Spacing: 1.15">Font: Times New Roman >Font Size: 14

>Align: Justify

7. Select the Heading "Academy Award" and Format It as Given Below.

>Font Color: Blue >Style: Bold and Underline >Align: Center

>Change All the Letters to Uppercase

8. Make the First Letter of the Paragraph Larger and Fall into Three Lines (Drop Cap).

9. Format the Heading "My Dream Career" with Style: Heading 2.

10. Create a Bulleted List for the Last Paragraph Lines of Document.

11. Enter "My Document Tutorial" Text as the Heading of the Table and Format It to Get the Following Output Using a Word Art. (Font: Arial Black, Font Size: 16, Align: Center)

12. Insert Footer with the Following Formatting Options.

>Caption: <My First Document>>Font: Times New Roman >Font Size: 12

13. Insert the W01 Image Given in the "Resources" Directory, to the Right Hand Side of the Bulleted List of the Document.

14. Prepare Your Class Time Table Using and Format the Entire Table as Given Below.

Change the Cell Size of the Table to Auto Fit to Contents. >Align: Center

15. Select the Heading Row and Format It as Given Below.

Convert All Text in to Capital Letters >Style: Bold >Align: Center

16. Insert a New Row Just Below the Last Row of the Table and Enter the Following Information into the New

Row: >Saturday: Special Lecture on Cloud Computing > Merging All the Column.

17. Send a Call Letter for All Applicants to Inform Interview Details Using Mail Merge Base

18. Preparing a Govt. Order / official Letter / Business Letter / Circular Letter

Covering Formatting Commands - Font Size and Styles - Bold, Underline, Upper Case, Lower Case, Superscript, Subscript, Indenting Paragraphs, Spacing Between Lines and Characters, Tab Settings etc.

19. Preparing a News Letter:

To Prepare a Newsletter with Borders, Two Columns Text, Header and Footer and Inserting a Graphic Image and Page Layout.

20. Creating and Using Styles and Templates

21 To Create a Style and Apply That Style in a Document

22 To Create a Template for the Styles Created and Assemble the Styles for the Template.

### **Spreadsheet Experiment:**

1. Create a Blank Spreadsheet in and Save It as "<Your Index No>\_E01".
2. Create a Table with 7 Rows and 8 Columns in the Cell Range A3:H9.
3. Insert a Title "Vivekananda College " and a Sub Title "Mark Sheet for a/L Biology- Class a", by Centering It with the Table, Making the Text Bold, and Changing the Font Size 16 for Main Title and 14 for Subtitle.
4. Enter Data of 6 Students Under the Columns, "Roll No", "Name", "Physics", "Chemistry", "Biology", and "English".
5. Use the Relevant Formula to Calculate the Total Marks and Average and Copy the Formula to the Relevant Cells.
6. Format the "Average" Column with Two Decimal Places.
7. Use Conditional Formatting to Change the Color of the Cells of Which the Average Mark is More Than 60, into Green.
8. Select the Columns, "Roll No", "Physics", "Chemistry", "Biology", and "English" Column and Draw a Column Chart.
9. Insert the Title, "Vivekananda College ", and the Sub Title, "Mark Sheet for a/L Biology - Class a" to the Top of the Chart.
10. Set the X Axis Labels with the Index Numbers.
11. Label the X Axis Title as, "Roll No" and Y Axis Title as, "Marks".
12. Label the Legends for 4 Subjects, "Physics", "Chemistry", "Biology" and "English".
13. Make Sure to Get a Graph Similar to the One Given Below.
14. Sorting Data, Filtering Data and Creation of Pivot Tables.
15. Operating on the Sheets: Finding, Deleting and Adding Records, Formatting Columns, Row Height, Merging, Splitting Columns etc. Connecting the Worksheets and Enter the Data.

### **Presentation Experiments**

1. Create a Presentation with Four Blank Slides.
  - Modify the Presentation as Follows.
  - Insert a Suitable Design Template.
  - Insert a Footer to Show Your Name and Your Student Id.
  - Insert Today's Date as a Fixed Date in the Date Area.
  - Make Necessary Changes to Appear Slide Numbers in the Slide Number Area.
  - Make Necessary Changes So That the Footer, Date and the Slide Number Do Not Appear on the Title Slide (First Slide).
  - Add Content to the Title Slide (First Slide) by Following the Instruction Given Below.
  - Type "River" as the Slide Title and It's Format Should Be Font Type: Arial, Style: Bold, Size:96, Color: Black
  - Type "Our Life Support" as the Sub Title and Insert an Image from the Resources Directory to a Suitable Location.

- Add Content to the Second Slide by Following the Instruction Given Below.
- Type the Slide Title as, "Rivers of North India" and Format It as, Font Type: Arial, Style: Bold, Size: 44, Color: Black

2. Insert the Following Content as Shown Below.

- The Ganga
- The Indus
- The Brahmaputra
- In the Third Slide, Add the Following Components.

Type the Slide Title as, "Tributaries"

- Insert Rivers and Their Tributaries of Slide 2 in a Table.
- Insert Few More Important Rivers of India with Their Regions.
- Add the Following Animation Effects to Your Presentation.
- Apply Emphasis Animation Effect to Each Main Point and Sub Point in the Second Slide.
- Apply Sound Effect When the Second Slide Appears in the Slideshow.
- Hide the Fourth Slide from the Slide Show.
- Save Your Presentation with the Following File Name <Rivers of \_North India>\_ P01. Next Practicals

3. Creating a New Presentation Based on a Template – Using Auto Content Wizard, Design Template and Plain Blank Presentation.

**Operating System**

4. Discuss all Internal and external commands of DOS with suitable example.
5. Discuss all Unix/Linux commands with suitable example.

## II Semester PGDCA 201(A)– JAVA PROGRAMMING

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### *Course Objectives:*

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- Introduce and Learn the Usage of the Java SDK Environment to Create, Debug and Run Java Programs.
  - Understand Fundamentals of Java Programming Such as Character Set, Variables, Data Types, and Control Structures, Array, Class and Methods.
  - Understand the Concepts of (OOPs) and Learn Implementation in Java Defining Classes, Invoking Methods, Using Class Libraries.
  - Introduce Strings, Vectors, Interfaces, Packages and Threads Handling in Java. Gain the Knowledge of Java Applets, AWT, Swings, Servlet.
- 

### *Course Outcomes :*

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- Explain and Apply the Object Oriented Concepts for Solving Real Problem.
  - Use the Java SDK Environment to Create, Debug and Run Simple Java Programs.
  - Apply Java Technology to Develop the Small Applications, Utilities, and Web Applications.
  - Apply Events Management and Layout Managers Using AWT, Swing, JDBC and Servlet for Developing the Software for Various Problems.
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### *Unit-wise Syllabus :*

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#### **UNIT-I**

Introduction to Object Oriented Programming: Basic concepts, benefits of OOPS, Application of OOP. Java evolution: history, features, C, C++ & Java a comparison. Java and WWW, HW & SW requirements for Java, Structure of simple Java program, Java tokens, statements, Java virtual machine, Command line arguments, programming style. constants & variables, symbolic constants, type casting: Various operators in Java (arithmetic, relational, logical, assignment, increment decrement, conditional, bitwise & special operator): arithmetic expressions & their evaluation, precedence of arithmetic operators, type conversions in expressions, operator precedence and associativity, mathematical functions.

#### **UNIT-II**

Decision making and branching: Decision making with if statement, simple if statement, the if ... else statement, nesting of if else statements, the else if Ladder, the switch statement. The ? operators, the while statement, the do statement, the for statement, jump in loops, labeled loops, classes, objects and methods; Defining a class, objects and methods: Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading. Static members, nesting of methods inheritance: extending a class, overriding methods, final variables and methods, final classes, finalize methods, abstract methods and classes visibility control.

#### **UNIT-III**

Arrays, strings and vectors: Arrays, one dimensional arrays, creating an array, two dimensional arrays. Strings, Vectors, Wrapper classes, defining interfaces, multiple inheritance, extending interfaces, implementing interfaces, accessing interface variable. Packages: Java API packages, using system packages, naming conventions, creating packages, accessing a package, using a package, adding a class to a package, hiding classes

#### **UNIT-IV**

Exception Handling & Multithreading: Exception Handling: Introduction to Exception Handling, Try-Catch, Finally, Throws. Multithreading Programming: Creating threads, extending the thread class stopping and

blocking a thread, life cycle of a thread, using thread methods, thread exceptions thread priority, Synchronization, implementing the runnable interface, thrashing, other consideration, demand segmentation.

#### **UNIT-V**

Applet programming: Local and remote applets, how applets differ from applications, preparing to write applets, building applets code, applet life cycle, creating an executable applet, designing a web page, adding applet to HTML file, running the applet, More about applet tag, passing parameters to applets. aligning the display more about HTML tags, displaying numerical values, getting input from the user. AWT Classes, Swing Classes, Event Handling, AWT Programming: Working with Windows, Graphics and Text, Using AWT Controls, Layout Managers and Menus, Handling Image, Animation, Sound and Video. Java Swing: Japplet, Icons and Labels, Text Fields, Buttons, Radio Buttons, Check Boxes, Combo Boxes, List Boxes, Tabbed and Scroll Panes, Tables. Event Handling:

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#### ***Reference Books:***

---

1. E. Balagurusamy, "Programming with Java, a Primer",TMH, ISBN-13: 978-0-07-061713-1, ISBN-10: 0-07-061713-9.
2. Patrick Naughton and Herbert Schildt, "Java: the Complete Reference", TMH Publication, ISBN 0-07-463769-X.
3. Yashavant kanetkar, "Let us Java", BPB Publications.
4. Ivan Bayross, "Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI",BPB Publications
5. Mastering in java, Techmedia Pub.schatz & Galvin
6. CoreJAVA 2 Volume- 1 Fundamentals sun Microsystems

# PGDCA-201 (B) -WEB TECHNOLOGY

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## *Course Objectives:*

- Learn How to Design and Develop a Web Page Using HTML and CSS
- Learn How to Link Pages So that they Create a Web Site.
- Design and Develop a Web Site Using Text Images Links Lists and Tables for Navigation and Layout.
- Style Your Page Using CSS Internal Style Sheets and External Style Sheets.
- Learn to use Java Script & XML in Web Design.
- Learn How to use Database in Web Design.

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## *Course Outcome:*

- Describe the concepts of WWW including Browser and HTTP Protocol.
- List the Various HTML Tags and use them to develop the User Friendly Web Pages.
- Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels.
- Develop the Modern Web Pages using the HTML and CSS Features with different layouts as per Need of Applications.
- Use the Java script to develop the dynamic Web Pages.
- Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity.
- Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.

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## *Unit-wise Syllabus :*

### **UNIT-I**

Introduction to Web Web Designing and Website Planning :concept of WWW Internet and WWW HTTP Protocol : Request and Response Web Browser and Web Servers Website Hosting-Free Vs. Paid Linux Vs. Windows Hosting Concepts & use of Database & Mail Servers Associated with Web Sites Features of Web Concepts of Effective Web Design Web Design Issues Including Browser Bandwidth and Cache Display Resolution Look and Feel of the Website Page Layout and Linking User Centric Design Sitemap Planning and Publishing Website Designing Effective Navigation. Website Hosting Issues C panel and FTP.

### **UNIT-II**

Web Development with HTML : Basics of HTML Formatting and Fonts Commenting Code Color Hyperlink Lists Tables Images Forms Meta Tags Character Entities Frames and Frame Sets Browser Architecture and Web Site Structure. Overview and Features of HTML5 use of HTML Code Editor & WYSIWYG Editor. Cascading Style Sheets (CSS): Style Sheets : Need for CSS Introduction to CSS Basic Syntax and Structure Using CSS Background Images Colors and Properties Manipulating Texts Using Fonts Borders and Boxes Margins Padding Lists Positioning Using CSS CSS2 Overview and Features of CSS3.

### **UNIT-III**

Technologies for Web Applications Javascript & XML: Javascript : Client Side Scripting with Javascript Variables Functions Conditions Loops and Repetition Pop Up Boxes Advance Javascript: Javascript and Objects Javascript Own Objects the Dom and Web Browser Environments Manipulation Using Dom Forms and Validations DHTML : Combining HTML, CSS and Javascript Events and Buttons. XML : Introduction of XML Validation of XML Documents DTD Ways to use XML, XML for Data Files Html Vs XML Embedding XML into HTML Documents Converting XML to HTML for Display Displaying XML Using

CSS and XSL Rewriting HTML as XML Relationship Between HTML SGML and XML Web Personalization Semantic Web Semantic Web Services. Transforming XML Using XSL and XSLT

#### **UNIT-IV**

Web Design with PHP: Introduction and Basic Syntax of PHP Decision and Looping with Examples PHP and HTML Arrays Functions Browser Control and Detection String Form Processing Files Advance Features: Cookies and Sessions Object Oriented Programming with PHP.

#### **UNIT-V**

Introduction to Database Driven Websites with PHP: PHP and MYSQL: Basic Commands with PHP Examples Connection to Server Creating Database Selecting a Database Listing Database Listing Table Names Creating a Table Inserting Data Altering Tables Queries Deleting Database Deleting Data and Tables PHP My admin and Database Bugs.

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#### Reference Books:

1. Roger S. Pressman David Lowe "Web Engineering" Tata McGraw Hill Publication 2007
2. Achyut S Godbole and Atul Kahate "Web Technologies" Tata McGraw Hill
3. Gopalan N P Akilandeswari "Web Technology: a Developer S Perspective" PHI
4. Chris Bates Web Programming: Building Internet Applications Wiley
5. C. Xavier "Web Technology & Design" Tata McGraw Hill.
6. Ivan Bay Ross "HTML DHTML Java Script Perl CGI" BPB.
7. Ralph Moseley and M.T. Savaliya- Developing Web Applications Wiley-India
8. Web Technologies Black Book Dreamtech Press
9. HTML5 Black Book Dreamtech Press
10. Joel Sklar- Web Design Cengage Learning
11. Harwani- Developing Web Applications in PHP and Ajax Mcgrawhill
12. P.J. Deitel & H.M. Deitel- Internet and WorldWideWeb How to Program Pearson

# PGDCA202 (A)-COMPUTER NETWORKS

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## *Course Objectives:*

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- Build an Understanding of the Fundamental Concepts of Computer Networking.
- Familiarize the Student with the Basic Taxonomy and Terminology of the Computer Networking Area.
- Introduce the Student to Advanced Networking Concepts Preparing the Student for Entry Advanced Courses in Computer Networking.

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## *Course Outcome:*

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- Demonstrate the Basic Concepts of Networking, Networking Principles Routing Algorithms IP Addressing and Working of Networking Devices.
- Demonstrate the Significance Purpose and application of Networking Protocols and Standards.
- Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.
- Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.
- Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.

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## *Unit-wise Syllabus:*

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### **UNIT-I**

Introduction to Computer Networks Types of Network - LAN WAN MAN Internet Network Topologies Transmission Media Communication Mode- Simplex Half Duplex Full Duplex Analog & Digital Signals Base Band Broad Band Error Detection and Correction OSI Model:- Functions of Each Layer Services and Protocols Inter-Networking Devices Hub Repeater Bridge Switch Modem Routers Gateways.

### **UNIT- II**

Multiplexing Multiplexer FDM TDM Statistical Multiplexing Modulation AM FM PM Switching Technique Message Switching Circuit Switching Packet Switching Virtual Circuit IEEE Standards 802.4 802.5. Fast Ethernet FDDI Token Ring.

### **UNIT- III**

Routing Algorithms:- Shortest Path Routing Distance Vector Routing Unicast Routing Multicast Routing Link State Routing Broadcast Routing Congestion Control Traffic Shaping. TCP/IP: Introduction History of TCP/IP Architecture Layers of TCP/IP Comparison Between OSI and TCP/IP Models Transmission Control Protocol User Datagram Protocol Internet Protocol IP Addressing IP Addressing Classes Internet Protocols-IP Packet ARP RARP ICMP

### **UNIT- IV**

Various Protocol HTTP Telnet FTP SMTP MIME UDP URL (Uniform Resource Locator) ISDN Channel ISDN Services Base Band ISDN Broadband ISDN Network Security : Network Security Issues Firewalls- Need and Features of Firewalls Types of Firewall Technology- Network Level and Application Level IP Packets Filter Screening Routers Limitations of Firewalls.



## **UNIT- V**

Introduction to Wireless Network Fundamentals of Cellular Systems Mobile Ad-Hoc and Sensor Networks  
Wireless PAN/LAN/MAN Multi-Path Propagation Path Loss Slow Fading Fast Fading Frequency Reuse Cell  
Splitting Cell Sectoring.

### ***Reference Books***

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1. Andrew S. Tanenbaum - Computer Networks Pearson - 4th Edition
2. Behrouz A. Forouzan - Data Communications and Networking - Global Ed - 5th Edition
3. William A. Shay - Understanding Data Communications and Networks - Course Technology Inc - 3rd Revised Edition
4. Prakash C. Gupta - Data Communications and Computer Networks - PHI - 2nd Edition
5. William Stallings - Data and Computer Communications Pearson Education India 10th Edition
6. Larry L. Peterson and Bruce S. Davie - Computer Networks - A Systems Approach - Morgan Kaufmann Publishers - Fifth Edition 2011

## PGDCA202(B) -BIG DATA ANALYSIS

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### *Course Objectives:*

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- Familiarize the Students with Most Important Information Technologies used in Manipulating, Storing, and Analyzing Big Data.
- This Course Gives Students all Around Learning of the Big Data Framework using Hadoop and Spark, Including Yarn, HDFS and Map reduce
- It Provide an Overview of Approaches Facilitating Data Analytics on Huge Datasets.

---

### *Course Outcome:*

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- Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
- Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics.
- Implement several Data Intensive tasks using the Map Reduce Paradigm

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### *Unit-wise Syllabus :*

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#### **UNIT-I**

Big Data- Introduction, Characteristics, Types, Elements, Traditional vs. Big Data Business Approach, Big Data Analytics, Advantages, Applications, Distributed & Parallel Computing for Big Data, Components in Big Data Architecture, Virtualization Approaches.

#### **UNIT- II**

Statistics and Probability: Sampling Techniques - Data Classification, Tabulation, Frequency and Graphic Representation, Measures of Central Value - Mean, Mode, Median, Random Variable and Probability Theory.

#### **UNIT- III**

Hadoop- Introduction, Features, Advantages, Versions, Key Considerations of Hadoop, RdbmsVsHadoop, Hadoop Ecosystem, HDFS - Architecture, Features, Commands, Processing Data withHadoop, Hadoop Yarn.

#### **UNIT- IV**

Mapreduce Framework, Features, Uses, Working onMapreduce, Mapreduce Input and Output Operations, Exploring Map and Reduce Functions, Mapreduce Optimization Technique, HBASE Introduction, Architecture, HBASE in Hadoop Applications.

#### **UNIT- V**

Processing Data withMapreduce, Task Execution & Environment – Installation of Eclipse, Hadoop, Java Development Kit and Linux Ubuntu OS, Mapreduce Program Steps to Obtain Word Count, Functionality of Input Format- Inputsplit, Recordreader, Fileinputformat, Output Process of Fileoutputformat – Outputformat, Recordwriter, Role of Combiner, Partitioner, Debugging Mapreduce.

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### *Reference Books:*

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1. Rob Kitchin The Data Revolution: Big Data Open Data Data Infrastructures And Their Consequences SAGE Publications Ltd
2. Croll and B. Yoskovitz Lean Analytics: Use Data to Build a Better Startup Faster o'reilly
3. Mayer-Schönberger and K. Cukier Big Data: A Revolution That Will Transform How We Live Work and Think

# PGDCA203 - DATABASE MANAGEMENT SYSTEM (DBMS)

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## *Course Objectives:*

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- To Understand the Fundamentals of Data Models and Conceptualize and Depict a Database System Using ER Diagram.
  - To Make a Study of Relational Database Design.
  - To Know about Data Storage Techniques and Query Processing.
  - To Acquire the Knowledge of Query Evaluation to Monitor the Performance of the DBMS.
  - To Impart Knowledge in Transaction Processing, Concurrency Control Techniques and Recovery Procedures.
- 

## *Course Outcome:*

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- Understand and describe the basic concepts and terminology of Database Management System.
  - Analyze and Design the database of applications using ER modeling and Normalization.
  - Evaluate business information problem and find out the data requirements of organization.
  - Demonstrate the database schema, data modeling and normalization process with the help of example. Implement the database design using appropriate database tools.
- 

## *Unit-wise Syllabus :*

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### **UNIT-I**

Basic Concept: An Introduction to database System, Database System Architecture, Purpose of DBMS, Data Independency, Basic File Systems, File Organization: Sequential, Index Sequential, Hosting. B-Tree based index, Sequential File Organization. Detailed Design of E-R Data Model, Security & Integrity: Introduction, Access Control. Crypto Systems, Statistical Data base Security, Concurrency Control: Transaction & Locking Database. Kinds of Failure, Recovery Techniques.

### **UNIT-II**

Three Data Models: An Overview of three Main Data Models i.e. Hierarchical Model, Network Model, Relational Model and their Inter comparison. Concept of Relation, Relational Algebra: Basic Operation like Union, Intersection, Difference, Product, Join. The Power of SQL (Creation, Insertion, Deletion, Indexing & Modification of Databases in SQL)

### **UNIT-III**

Normalisation: Relational Database Design: Integrity Constraints, Functional Dependency: Single Value and Multi Value Functional dependence, Normal Forms: I, II, III, Boyce Codd, & IV Normal forms. Join dependency. Special Purpose Databases: OODBMS- Object Based Databases, OO Data Model, OO Languages, Persistence, Object, Relational Databases, XML, Structure of XML, Temporal Databases, Mobile Databases, Spatial Databases

### **UNIT-IV**

Introduction to Database and Foxpro package: Ideas of database hierarchy (bit, byte, field, record). Foxpro commands: create, use, list, display, edit, browse, append, insert, delete, zap, pack, copy, to print, quit, clear, go top, go bottom, modify structure, recall, replace, sort, index, locate, continue, seek, search, find, close. Arithmetic, date, time and string function with database using commands/ functions such as count, average, sum, time, day, dow, cdow, year, date, ctod, dtoc, cmonth, month, val, trim, str. displaying information with ? and ??.

## **UNIT- V**

Programming: Using Input, Output statements and Conditional statement ACCEPT, INPUT, IF-ELSE-ENDIF, DO CASE-ENDCASE, DO WHILE-ENDDO, TEXT-ENDTEXT, SKIP, WAIT, STORE, SET commands. Generation of Report, Label and Customized Screen, Use of multiple files: Master file updation, Setting relations

### ***Reference Books:***

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1. Henry F. Korth & A. Silbershatz: Data Base System Concepts, MGH
2. C.J. Date: Database Management System, MGH
3. R. K. Taxali: Foxpro 2.6, TMH.
4. Arun K. Majumdar & P. Bhattacharya: Data Base Management System, TMH
5. Jeffrey O. Ullman: Principles of Database Systems, Galgotia Pub. Co. Ltd.
6. Bipin C. Desai: An Introduction to Database Systems, Galgotia Pub. Co. Ltd.
7. James Martin: Principles of Database Management, PHI
8. James Martin, Computer Database organization, PHI

## PGDCA204 – Software Lab I (Problem based on 201)

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### *Course Objectives:*

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- Implement Strings, Vectors, Interfaces, Packages and Threads Handling in Java. Implement Java Applets, AWT, Swings, Servlet.
  - Learn and Understand the Implementation of GUI Application, Web Applications, N-Tier Architecture.
  - Develop the Understandings of File Handling, Database Connectivity, Java Servlets and Web Application in Java.
  - Learn and Understand the Implementation of GUI Application, Web Applications, N-Tier Architecture.
- 

### *Course Outcomes*

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- Use the Java SDK & JRE Environment to Create, Debug and Run Simple Java Programs.
- Analyze the Problem, Identify the Requirements & Features of Applications and Utilities
- Implement Object Oriented Concepts for Solving Real Problem.
- Develop Small Applications, Utilities, and Web Applications Using AWT, Event and Layout Managers

### **List of Experiments on Java:**

1. Write a Program in Java to Calculate the Simple Interest.
2. Write a Program in Java to Calculate Sum of Two Numbers Input from Command Line Argument.
3. Write a Program in Java to Calculate Area of Circle Using Scanner Class.
4. Write a Program in Java to Calculate Square Root of a Number.
5. Write a Program in Java to Display Name, Age, Calendar and Salary of a Person Input from the Keyboard.
6. Write a Program in Java to Display Grading of Student When His Percentage is Input from Keyboard.
7. Write a Program in Java to Display Odd Number from 1 to 100.
8. Write a Program in Java to Calculate the Factorial of a Number.
9. Write a Program in Java to Determine Whether a Number Input from Keyboard is Prime Number Or Not.
10. Write a Program in Java to Display the Prime Numbers from 1 to 500 Using Function.
11. Write a Program in Java to Show Accessing Class Members and use a Dot(.).
12. Write a Program in Java to Show Multilevel Inheritance.
13. Write a Program in Java to Show Single Inheritance.
14. Write a Program in Java to Concatenate Two Strings Without Using Library Function.

15. Write a Program in Java to Make First Alphabet Capital of Each Word in a String.
16. Write a Program in Java to Get the Last Index of Any Given Character in a String.
17. Write a Program in Java to Reverse Words of a String.
18. Write a Program in Java to Find Occurrences of Each Character in a String.
19. Java Program to Get String and Count Number of Words in Provided String.
20. Write a Program in Java to Check Given String is Palindrome String Or Not in Java.
21. Write a Program in Java to Reverse Each Word of Given String.
22. Write a Program in Java to Get Sub String from a Given String.
23. Java Program to Convert String to Lowercase and Uppercase.
24. Create a Java Applet and Show the use of Drawstring() Function.
25. Create a Java Applet to Show How to use Various Methods of Applet Class and Graphics Class in a Java Applet.
26. Write a Program in Java to Show the use of Interface.
27. Write a Program in Java to Display the Following Pattern.

```
1
2 2
3 3 3
4444
55555
```

28. Write a Program in Java to Display the Following Pattern Using Function.

```
1
2 2
3 3 3
4444
55555
```

29. Write a Program in Java to Display the Following Pattern Using Function.

```
1
2
2 3
2 3 4
2345
```

30. Write a Program in Java to Display the Following Pattern Using Function.

```
1
3
4 5 6
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## PGDCA205 – Software Lab II (Problem based on 203)

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### *Course Objectives:*

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- To provide practical practice to the discipline of database management.
- To familiarise the participant with the nuances of database environments towards an information-oriented data-processing oriented framework.
- To give a good formal foundation on the relational model of data.
- To give an introduction to systematic database design approaches.
- To present the concepts and techniques relating to Query Processing, Form and Reports in Ms Access.

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### *Course Outcome:*

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- Understand and apply the key concepts of database technology.
- Analyze, design and implement the database system to solve the real problems.
- Carry out the administration and Management activities of Database System using SQL, Foxpro
- Write the SQL & Foxpro program for optimal query for fetching the information from database

### **LIST OF EXPERIMENTS ON DBMS**

1. Draw an ER Diagram for University Database.
2. Draw an ER Diagram for Library Management System. Convert it to Tables.
3. Create a Library Management Schema/ Database and Search Anomalies in it.
4. Normalize the Following Schema with Given Constraints.  
Books(Accessionno,Isbn,Title,Author,Publisher)  
Users(Userid,Name,Deptid,Deptname)  
Accessionno ->ISBN  
ISBN ->Title  
ISBN -> Publisher  
ISBN ->Title  
Userid -> Name,  
Userid ->Deptid  
Deptid -> Department
7. Compare 3NF and BCNF with Appropriate Example

### **Database Query**

8. Give Exercise on DDL and DML.
9. Create a Database Named “School.Mdb” and Perform the Following Tasks Using Ms Access or My SQL

10. Create a Table Named “Studentinfo” Having Following Table Structure.

Field Name	Data Type	Structure
Class	Number	
Section	Text	
Roll No.	Number	
Name	Text	40 Characters Long
Status	Lookup Wizard	Two Value:Senior and Junior
Photo	Ole Object	Photos of Student
Dob	Date/Time	Date of Birth of Students
Remarks	Memo	

- Fill At List 5 Records
- Prepare a Query to Display All Records and Name Should Be in Ascending Order.
- Prepare a Query Name “ Senior” to Display Records Including Fields Name, Class, Sec, Rollno. Status, Photo and Value of “Status” Field Must Be senior
- Prepare a Form of Above Query “Senior”
- Prepare a Report of All the Fields of Above Table

#### Forms and Report

11. Create a Database Named “Library.Mdb” and Perform the Following Tasks:

12. Create a Table Named “Book” Having Following Structure:

Field Name	Data Type
B o o k i d	T e x t
B n a m e	T e x t
W n a m e	T e x t
P y e a r	Date/Time
P n a m e	T e x t
P r i c e	Currency

- Add at Least 5 Records.
- Prepare a Query to Display Only Records Including Book Name, Writer Name and Name. Save the Query as “Q\_Book”.
- Prepare a Query to Display All Records on the Basis of Price Which is More Than Rs500.
- Prepare a Form on the Basis of Table.
- Prepare a Report on the Basis of Query Named "Q\_Book

#### Fox Pro

13. Discuss all Foxpro commands with suitable example.
14. Create a Report in Foxpro.
15. Create a Form in Foxpro.
16. Write a program in Foxpro which illustrate the use of If-Else-Endif.
17. Write a program in Foxpro which illustrate the use of Do Case End Case.
18. Write a program in Foxpro which illustrate the use of Do while-end do.
19. Write a program in Foxpro which illustrate the use of Text-EndText.