Curriculum
for

One Year Diploma Programme
in

COMPUTER APPLICATIONS

(Institute of Entrepreneur Development, UP)

Prepared by:

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1. PREFACE

The rapid industrialization and globalization has created an environment for free flow of information and technology through fast and efficient means. This has led to shrinking of the world, bringing people from different culture and environment together and giving rise to the concept of world turning into a global village. In India, a shift has taken place from the forgettable years of closed economy to knowledge based and open economy in the last few decades. In order to cope with the challenges of handling new technologies, materials and methods, we have to develop human resources having appropriate professional knowledge, skills and attitude. Technical education system is one of the significant components of the human resource development and has grown phenomenally during all these years. Now it is time to consolidate and infuse quality aspect through developing human resources, in the delivery system. Academic institute play an important role in meeting the requirements of trained technical manpower for industries and field organizations. The initiative has been taken by Institute of Entrepreneur Development, Uttar Pradesh to design one-year diploma in Computer Applications.

In order to meet the requirements of future technical and vocational manpower, we will have to revamp our existing technical and vocational education system and one of the most important requirements is to develop outcome-based curricula of diploma programmes. The curricula for diploma programme has been designed by adopting time-tested and nationally acclaimed scientific method, laying emphasis on the identification of learning outcomes of diploma programme.

The real success of the diploma programme depends upon its effective implementation. However best the curriculum document is designed, if that is not implemented properly, the output will not be as expected. In addition to acquisition of appropriate physical resources, the availability of motivated, competent and qualified faculty is essential for effective implementation of the curricula.

It is expected of the IED, UP to carry out job market research on a continuous basis to identify the new skill requirements, reduce or remove outdated and redundant courses, develop innovative methods of course offering and thereby infuse the much needed dynamism in the system.

2. ACKNOWLEDGEMENTS

We gratefully acknowledge the assistance and guidance received from the following persons:

i) Director, Institute of Entrepreneur Development, Lucknow, Uttar Pradesh for taking keen interest in the design of this curriculum.

ii) Director, National Institute of Technical Teachers' Training and Research, Chandigarh for his support and academic freedom provided to Curriculum Development Centre.

iii) All the participants from industry/field organizations, academic institute for their professional inputs during curriculum workshops.

iv) Faculty from different departments of NITTTR, Chandigarh for design of curriculum.

Coordinator

3. SALIENT FEATURES OF DIPLOMA PROGRAMME

1) Name of the Programme:	Diploma Programme in Computer Applications
2) Duration of the Programme:	One years (Two Semesters)
3) Entry Qualification:	10 +2
4) Intake:	As prescribed by the IED, UP
5) Pattern of the Programme:	Semester Pattern
6) NSQF Level:	Level - V
6) Skill Development:	More than 70 % practice oriented
7) On site / In-house Training:	Six weeks
8) Project Work/Internship:	Project Work / Internship has been included in the curriculum to enable the students to familiarize with the practices and procedures being followed in the industries and provide an opportunity to work on some live projects in the industry.

4. EMPLOYMENT OPPORTUNITIES

Diploma holders in Computer Applications can find employment in following divisions:

1. Service Division (IT enabled services, maintenance service and installation of computer services)
2. Assembly and Quality Control Division
3. Software Development and Testing Industries
4. Web Development Industries
5. Publishing Industry
6. Animation Industry
7. Data Processing Industry
8. Marketing Division(Corporate Handling, SME, Institutional Segment, Government Tender Business)
9. Telecommunication Sector
10. Teaching Organizations (Polytechnics, Vocational Institutions etc)
11. Networking(LAN, WAN etc)
12. Defence Services/Police Services/Cyber Services/Forensic Services
13. Call Centres, BPO etc.

While in employment, the following areas of activity in different organisations (industry and service sector) are visualized for diploma holders in Computer Applications:

1. Assembly and installation of computer systems, peripherals and software
2. Programming customer based applications including web page designing
3. Testing and maintenance of computer systems
4. Marketing of software and hardware
5. Teaching and training at educational institutions
6. Self employment – call centres, BPO, EPO etc.
7. Network installation and maintenance
8. Cyber Cafés

Wage Employment

1. Service engineer/customer support engineer/maintenance engineer in installation, maintenance and service of computer systems and networking
2. Assembly supervisor in manufacturing and production activity
3. Data entry operator, computer operator, DTP operator, technician
4. Technical Assistant/junior engineer in quality control and testing activities of computer systems manufacturing
5. Junior marketing executive/junior sales executive/sales engineer in marketing activities
6. Junior/senior technical assistant in R&D laboratories and educational institutions to help in maintaining computers and networks
7. Test engineers in process industry

Self Employment

1. Small scale unit doing third party service and maintenance of computer systems and networks
2. Small scale vendor of computer cards, computer peripherals and electronic components and devices
3. Setting up of computer assembly unit (small scale)
4. Setting up of training institute for computer assembly maintenance and networking
5. Web Designing/Publishing/Software Development Entrepreneurship

5. **LEARNING OUTCOMES**

After undergoing this programme, students will be able to:

1.	Communicate effectively in English with others
2.	Use cutting tools, equipment and tooling for fabrication of jobs by following safe practices at the workplace
3.	Work on different software for word processing, powerpoint presentation, spreadsheets and communicate ideas electronically
4.	Assemble, troubleshoot and maintain computer and peripherals and install various software
5.	Write, compile and debug programmes using different programming constructs
6.	Identify the software process model for specific software application and interpret different phases of software development life cycle
7.	Create, manage and secure database
8.	Design multimedia graphics and create script of multimedia animations using authoring tools
9.	Design, develop and host websites using internet technologies
10.	Plan and execute given task and project as a team member or a leader
11.	Solve common programming problems and write programs in JAVA
12.	Use various functions and components of different operating systems
13.	Familiarize with working and architecture of computer components
14.	Set-up, diagnose problems, troubleshoot computer networks and maintain security of the networks
15.	Apply the acquired knowledge and skills in solving live problems in the Computer and I.T. industry

6. DERIVING CURRICULUM AREAS FROM LEARNING OUTCOMES

The following curriculum areas have been derived from learning outcomes:

Sr. No.	Learning Outcomes	Curriculum Areas/Subjects
1.	Communicate effectively in English with others	English Language
2.	Work on different software for word processing, power point presentation, spreadsheets and communicate ideas electronically	Office Automation
3.	Design, develop and host websites using internet technologies	Web Design
4.	Set-up, diagnose problems, troubleshoot computer networks and maintain security of the networks	Network Fundamentals
5.	Familiarize with working and architecture of computer components	Computer Fundamentals
6.	Use various functions and components of different operating systems	Foundations of IT
7.	Create, manage and secure database	Database Systems
8.	Use various mobile technologies and their use in different application scenarios	Application Development
9.	Apply the acquired knowledge and skills in solving live problems in the Computer and I.T. industry	Project Work / Internship
10.	Hand on practice and industrial environment exposure	On site / In-house training

7. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subjects	Hours Per Week in each Semester	
		Semester I	Semester II
1.	Communication Skills	8	-
2.	Office Automation	8	-
3.	Web Design	8	-
4.	Network Fundamentals	8	-
5.	Computer Fundamentals	8	-
6.	On site / In-house Training Seminar		2
7.	Foundations of Information Technology		6
8.	Database Systems		6
9.	Application Development		6
10.	Project Work / Internship		20
Total		**40**	**40**

STUDY SCHEME FOR DIPLOMA PROGRAMME IN COMPUTER APPLICATIONS

FIRST SEMESTER :

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
1.1	Communication Skills	2	-	6	5	25	25	50	50	3	50	3	100	150
1.2	Office Automation	2	-	6	5	25	25	50	50	3	50	3	100	150
1.3	Web Design	2	-	6	5	25	25	50	50	3	50	3	100	150
1.4	Network Fundamentals	2	-	6	5	25	25	50	50	3	50	3	100	150
1.5	Computer Fundamentals	2	-	6	5	25	25	50	50	3	50	3	100	150
Total		**10**	-	**30**	**25**	**125**	**125**	**250**	**250**		**250**		**440**	**750**

On site / In-house Training : After First semester, students shall undergo Training of 6 Weeks.

SECOND SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
2.1	On site or In-house Training Seminar	-	-	2	1	-	40	40	-	-	60	03	60	100
2.2	Foundations of Information Technology	2	-	4	4	25	25	50	50	3	50	3	100	150
2.3	Database Systems	2	-	4	4	25	25	50	50	3	50	3	100	150
2.4	Application Development	2	-	4	4	25	25	50	50	3	50	3	100	150
2.5	Project Work	-	-	20	10	-	50	50	-	-	150	03	150	200
Total		**6**	-	**34**	**23**	**200**	**300**	**500**	**300**		**200**		**500**	**750**

9. DETAILED CONTENTS

1.1 COMMUNICATION SKILLS

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RATIONALE

Communication skills play an important role in career development. This course aims at introducing basic concepts of communication skills with an emphasis on developing personality of the students. Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills etc.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Develop basic speaking and writing skills including proper usage of language and vocabulary so that they can become highly confident and skilled speakers and writers.
- Be informed of the latest trends in basic verbal activities such as presentations, facing interviews and other forms of oral communication.
- Also develop skills of group presentation and communication in team.
- Develop non-verbal communication such as proper use of body language and gestures.

DETAILED CONTENTS

UNIT I

Communication: Theory and Practice

Basics of communication: Introduction, meaning and definition, process of communication etc. Types of communication: formal and informal, verbal, non-verbal and written Barriers to effective communication. 7 Cs for effective communication (considerate, concrete, concise, clear, complete, correct, courteous). Art of Effective communication, Choosing words, Voice, Modulation, Clarity, Time, Simplification of words, Technical Communication.

UNIT II:

Soft Skills for Professional Excellence

Introduction: Soft Skills and Hard Skills, Importance of soft skills, Life skills: Self-awareness and Self-analysis, adaptability, resilience, emotional intelligence and empathy etc. Applying soft skills across cultures. Case Studies.

Unit III

Reading Comprehension

Comprehension, vocabulary enhancement and grammar exercises based on reading of the following texts:

Section-1 Malgudi Days: R.K. Narayan The Room on Roof: Ruskin Bond "The Gift of the Magi" by O. Henry "Uncle Podger Hangs a Picture" Jerome K. Jerome

Section-2 Night of the Scorpion by Nissim Ezekiel, Stopping by Woods on a Snowy Evening by Robert Frost, Where the Mind is Without Fear by Rabindranath Tagore, Ode to Tomatoes by Pablo Neruda

Unit IV

Professional Writing

The art of precis writing, Letters: business and personnel, Drafting e-mail, notices, minutes of a meeting etc. Filling-up different forms such as banks and on-line forms for placement etc.

Unit V

Vocabulary and Grammar

Vocabulary of commonly used words Glossary of administrative terms (English and Hindi) One-word substitution, Idioms and phrases etc. Parts of speech, active and passive Voice, tenses etc., Punctuation.

LIST OF PRACTICALS

1. Listening Skills Listening Process and Practice: Introduction to recorded lectures, poems, interviews and speeches, listening tests.

2. Introduction to Phonetics Sounds: consonant, vowel, diphthongs, etc. transcription of words (IPA), weak forms, syllable division, word stress, intonation, voice etc.
3. Speaking Skills Standard and formal speech: Group discussion, oral presentations, public speaking, business presentations etc. Conversation practice and role playing, mock interviews etc.
4. Building vocabulary Etymological study of words and construction of words, phrasal verbs, foreign phrases, idioms and phrases. Jargon/ Register related to organizational set up, word exercises and word games to enhance self-expression and vocabulary of participants.

RECOMMENDED BOOKS

1. J.D.O'Connor. Better English Pronunciation. Cambridge: Cambridge University Press, 1980.
2. Lindley Murray. An English Grammar: Comprehending Principles and Rules. London: Wilson and Sons, 1908.
3. Kulbhushan Kumar, Effective Communication Skills, Khanna Publishing House, New Delhi (Revised Edition 2018)
4. Margaret M. Maison. Examine your English. Orient Longman: New Delhi, 1964.
5. M. Ashraf Rizvi. Effective Technical Communication. Mc-Graw Hill: Delhi, 2002.
6. John Nielson. Effective Communication Skills. Xlibris, 2008.
7. Oxford Dictionary
8. Roget's Thesaurus of English Words and Phrases
9. Collin's English Dictionary
10. Daniel Jones. The Pronunciation of English. Cambridge: Cambridge University Press, 1956.
11. James Hartman & et al. Ed. English Pronouncing Dictionary. Cambridge: Cambridge University 35 First Year Curriculum Structure Common to All Branches Press, 2006.
12. J.Sethi & et al. A Practice Course in English Pronunciation. New Delhi: Prentice Hall, 2004.

Note: This subject contains five units of 20 % equal weight age with more than 60% practice sessions for effective communication skill development.

1.2 OFFICE AUTOMATION

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RATIONALE

It covers the handling of whole field of word processing and desktop publishing using text handling software and systems. The course is to provide an in-depth training in use of office automation, internet and internet tools and also helps the candidates to get acquainted with IT.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Perform Documentation
- Develop Power Point Presentations
- Create Excel Sheet
- Use PhotoDraw
- Work with Outlook

DETAILED CONTENTS

UNIT I

Microsoft Office Basics

Microsoft Office 2000/XP Introduction; Microsoft Word 2000/XP; Microsoft Excel 2000/XP; Microsoft Access 2000/XP; Microsoft PowerPoint 2000/XP, Microsoft Outlook 2000/XP; Internet Explorer 5.0; Microsoft FrontPage 2000/XP; Microsoft Publisher 2000; Microsoft PhotoDraw 2000/XP; Microsoft Office Bar; Using the Mouse (To Click, To double-click, To select, To drag, To scroll, To choose from a menu, To move a window, To resize a window, To minimize a window, To restore a minimized window, To maximize a window, To switch windows, To close a window, Remember); Microsoft Office 2000/XP and Web (Microsoft Word 2000/XP, Microsoft Excel 2000/XP, Microsoft Access 2000, /XP Microsoft PowerPoint 2000/XP, Microsoft Outlook 2000/XP, Microsoft FrontPage 2000/XP); Common Keyboard Commands.

UNIT II:

Word Processing

Creating Your Document in Word 2000/XP: Introduction; Saving the file; Formatting the text, Alignment of Text; Applying Fonts; Spell Checking; Consulting Thesaurus; Assign Character Styles (Assign a Character Style, Create a character style); Borders and Shading (Apply Borders and Shading); Closing of the File; Save as option; Open File (From File menu, From Open Icon); Printing Your Document. Proofing Your Document in Word 2000/XP: Introduction; Editing Tools; AutoCorrect (Add AutoCorrect Entries Without Formatting, Add New AutoCorrect Entries with Formatting); Auto Text (Creating an AutoText Entry, AutoComplete Option); AutoFormat (AutoFormat as You Type, AutoFormat on Command, Auto Formatting Text); Find and Replace; Find; Replace Text; Page Numbering; Header and Footer (Adding a Header or Footer in Your Document); Footnotes and Endnotes (Add a Footnote or Endnote).

Unit III

Working with MS Excel

Getting Started with MS-Excel: Staring, Menu system, tabbed dialog bxes, workbooks, worksheets within workbooks, Cells : cell reference, active cell toolbar: (displaying, hiding, getting poput tool explanations, controlling size, moving tool bars, drop down palettes) using online help. Worksheets with in Wbs: Activating Wks, scrolling tabs, printing Wks, inserting, deleting, copying/moving, manipulation of Multiple files. Creating a Worksheet: Introduction; Copying Formula.

Unit IV

Advanced Techniques of Excel 2000/XP

Introduction; Auditing a Workbook (To Trace the Precedents for a Formula); Comment Inserting (To Insert a Comment); Formulas That Make Decisions (How the If function works); Headers and Footers; Merging Workbooks (To merge workbooks); Outlines (Outline a Worksheet Automatically, Clear Entire Outline, Show or Hide Outline Symbols, Group Rows or Columns in an Outline, Ungroup Rows or Columns in an Outline, Remove Group from Outline, Set Outline Options); Printing Column and Row Labels on Every Page; Protecting a Workbook (To unlock cells so that others can edit the cell contents, To protect a workbook, To share a workbook); Ranges, Naming (To name a range); References (Absolute references, Mixed references); Seeking Goals (To seek a goal); Sheets Naming (To Name a Sheet);

Working with Workbooks (Copying Entries Between Workbooks, Moving Sheets Between Workbooks, Deleting Sheets).

Unit V

Power Point Basics

Creating Presentation Using AutoContent Wizard, Creating New Presentation, Introduction; Changing views. OLE Tips for Power point, Terminology, Color Schemes, PowerPoint Templates, Getting Started, Views. Creating Presentations the Easy Way: AutoContent Wizard, The Pick A Look Wizard, Masters, Adding Slides. Working with Text in Power Point: Editing and Moving Text, Working in Outline View, Spell-checking, Finding and Replacing Text, Adding Removing Periods in Sentences, Formatting Text, Aligning Text, Word Tables Power Point. Working with Graphics in Power Point: Importing Images from the Outside World, The CLIP PART Gallery, Drawing in Power Point, Creating Organizational Charts, Inserting Photos in Your PowerPoint Presentation. Showtime: If we can put a man on the Moon…, Arranging, Previewing and Rehearsing, Transition and Build Effects, Showing Slides Out of Order, Deleting Slides, Printing Presentation Elements, Creating Overhead Transparencies, Obtaining Colour 35mm Slides, Sharing Presentation Files with others.

LIST OF PRACTICALS

1. Using word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in Word.
2. Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes.
3. Creating a Newsletter : Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs
4. Creating a Feedback form - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word
5. Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

6. Calculations - Features to be covered:- Cell Referencing, Formulae in excel – average, std.deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP
7. Performance Analysis - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting
8. Cricket Score Card - Features to be covered:-Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation
9. Basic power point utilities and tools which help to create basic power point presentation. Topic covered includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows
10. Interactive Presentation - Topics covered includes : Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts
11. Concentrating on the in and out of Microsoft power point. Helps them learn best practices in designing and preparing power point presentation. Topics covered includes :- Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing
12. Power point test would be conducted. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

RECOMMENDED BOOKS

1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech,2005
2. The Complete Computer upgrade and repair book,3rd edition Cheryl A Schmidt, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A + Handbook – Kate J. Chas PHI (Microsoft)

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

1.3 WEB DESIGN

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RATIONALE

Today various technologies are available for developing web-based applications. These technologies can be equally used for developing both web based educational and business applications. Therefore it is important that the students of polytechnics develop competency to use Hyper Text Markup Language (HTML) technologies for developing professional static web environment. This course would be the basis for developing dynamic web pages.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Develop a dynamic webpage by the use of java script and DHTML.
- Write a well formed / valid XML document.
- Write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
- Develop and host a static website using Hyper Text Markup Language with web technology features like Cascading Style Sheets etc.

DETAILED CONTENTS

UNIT I

Introduction to HTML

Information Files Creation; Web Server; Web Client/Browser (Understanding how a Browser communicates with a Web Server); Hyper Text Markup Language (HTML) (HTML Tags, Paired Tags); Commonly used HTML Commands (The structure of an HTML program, Document Head, Document Body); Titles and Footers; Text Formatting (Paragraph Breaks, Line Breaks); Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.); Spacing (Indenting Text). Lists: Types of Lists (Unordered List (Bullets), Ordered Lists (Numbering), Definition Lists). Adding Graphics to HTML Documents: Using the Border attribute; Using the Width and Height Attribute; Using the Align Attribute; Using the ALT Attribute

UNIT II:

Advanced Features of HTML

Tables: Introduction (Header, Data rows, The Caption Tag); Using the Width and Border Attribute; Using the Cellpadding Attribute; Using the Cellspacing Attribute; Using the BGCOLOR Attribute; Using the COLSPAN and ROWSPAN Attributes. Linking Documents: Links (External Document References, Internal Document References); Images as Hyperlinks (Image Maps). DHTML AND STYLE SHEETS: Defining Styles; Elements of Style; Linking a Style Sheet to an HTML Document; In-line Styles; External Style Sheets; Internal Style Sheets; Multiple Styles. FRAMES: Introduction to Frames (The tag, The tag, Targeting Named Frames. Frameset Definition; Frame Definition; Nested Framesets.

Unit III

Introduction to Web Servers and Advanced Mark-up Languages

Protocols and programs, secure connections, application and development tools, the web browser, What is server, setting up UNIX and LINUX web servers, Logging users, dynamic IP Web Design: Web site design principles, planning the site and navigation. XML, XSL and XSLT: Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, XML with application, XSL and XSLT.

Unit IV

Introduction to JAVASCRIPT

JavaScript in Web Pages (Netscape and JavaScript, Database Connectivity, Client side JavaScript, Capturing User Input); The Advantages of JavaScript (An Interpreted Language, Embedded within HTML, Minimal Syntax - Easy to Learn, Quick Development, Designed for Simple, Small Programs, Performance, Procedural Capabilities, Designed for Programming User Events, Easy Debugging and Testing, Platform Independence/Architecture Neutral); Writing JavaScript into HTML; Building Up JavaScript Syntax; Basic Programming Techniques (Data Types and Literal, Type Casting, Creating Variables, Incorporating variables in a Script, The JavaScript Array, The Elements of an Array, The JavaScript Array and its length Property); Operators and Expressions in JavaScript (Arithmetic Operators, Logical Operators, Comparison Operators, String Operators, Assignment Operators, The Conditional

Expression Ternary Operator, Special Operators); JavaScript Programming Constructs; Conditional Checking (If - then - else, Immediate If (Conditional expression); Super Controlled - Endless Loops (For Loop); Functions in JavaScript (Built-in Functions, User Defined functions, Declaring functions, Place of Declaration, Passing Parameters, Variable Scope, Return Values, Recursive Functions); Placing text in a Browser; Dialog Boxes (The Alert dialog box, The Prompt dialog box, The Confirm dialog box).

Unit V

The JavaScript Document Object Model

Introduction (Instance, Hierarchy); The JavaScript Assisted Style Sheets DOM (JSSS DOM); Understanding Objects in HTML (Properties of HTML objects, Methods of HTML objects); Browser Objects (The Web Page HTML Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated); Handling (WEB PAGE) Events Using JavaScript (Named JavaScript Event handlers). Forms and validations DHTML: Combining HTML, CSS and Javascript, events and buttons, controlling your browser, Ajax: Introduction advantages & disadvantages, ajax based web application, alternatives of ajax.

LIST OF PRACTICALS

1. Analyze 5 website on terms of usability and accessibility terms
2. Develop basic HTML pages with Tables and Hyperlinks.
3. Develop HTML pages with Frames
4. Explain various features of Dreamweaver/or any other HTML editing interface.
5. Setup basic sites with Dreamweaver/or any other HTML.
6. Develop various pages using Cascading Style Sheets to Style Your Page.
7. Develop various pages using CSS Selectors and embedded Style sheets.
8. Styling Tables with help of CSS.
9. Host the designed website on any web server
10. Create a web page using DHTML basic Tags
11. Create Forms in web pages
12. Implementing simple Java Script on HTML Web Page
13. Mini Project on Dynamic Webpage Creation with specific case studies

RECOMMENDED BOOKS

1. Jon Duckett "Beginning Web Programming" WROX.
2. Marty Hall and Larry Brown "Core Servlets and Java Server pages Vol. 1: Core Technologies", Pearson.
3. Sebesta, "Programming world wide web" Pearson.
4. Dietel and Nieto, "Internet and World Wide Web – How to program", PHI/Pearson Education Asia.
5. Murach, "Murach's beginning JAVA JDK 5", SPD
6. Wang, "An Introduction to web Design and Programming", Thomson

SOFTWARE/LEARNING WEBSITES

1. Adobe Dreamweaver: Website: http://www.adobe.com/devnet/dreamweaver.html
2. Learn HTML/CSS Website: http://www.w3schools.com/html/default.asp
3. Learn HTML/CSS Website: http://www.html.net/

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

1.4 NETWORK FUNDAMENTALS

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RATIONALE

For diploma students it is important to understand the function of computer networks and obtain requisite knowledge about hardware and software requirements and acquire skills to establish a network using necessary hardware & software tools and configure various services over it. The objectives of this course are to make students learn the technology of establishing, commissioning and maintaining computer networks.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Describe various protocols, models in networks.
- Explain operations of TCP, HTTP, and DNS.
- Illustrate use of Subnets, Ipv4 and Ipv6 in computer networks.
- Design, Establish and Commission simple computer networks
- Identify and solve network operational problems.

DETAILED CONTENTS

UNIT I

Data Communications

Multiplexing, Signaling, Encoding & Decoding, Error Detection & Recovery, Flow Control, Sliding Window, Congestion Management. COMMUNICATION NETWORKS: Introduction to networking, OSI Model for Networking, Internet, ATM, Network Components (Cables, Hubs, Bridges, Switches, Routers), Network Topologies, Shared Medium, Peer to Peer, Hybrid Technology. NETWORK TECHNOLOGIES: Local Area Network Technologies, Ethernet Technologies, Ethernet Versions, Token Ring Technologies, Wide Area Network Technologies (Frame Relay, SMDS, ISDN, SONET, PPP, HDLC, LLC), Wireless Networks (Radio Frequencies, Microwave Frequencies, Infrared Waves.

UNIT II:

Multiple Access

Design Issues, Distributed & Centralized Design, Circuit Mode & Packet Mode Design, Implementation Issues, Performance Considerations, Base Technology (FDMA, TDMA, CDMA, Centralized Access, Circuit Mode Access, Poling or Packet Mode Access, Reservation Based Access), Distributed Access (decentralized polling, CSMA, CSMA/CA, CSMA/CD, Busy Tone Multiple Access & Multiple Access Collision Avoidance, Token Passing, ALOHA, Slotted ALOHA, Reservation ALOHA), Hardware Addressing SWITCHING: Circuit Switching (Time Division switching, Space division switching, time space switching, time space time switching), Packet Switching (Port Mappers, Blocking, ATM Switching, Switching Fabric (Crossbar, Broadcast, Switching Fabric Elements), Bridges (Transparent bridges, Spanning Tree Algorithm, Virtual LANS), Switches.

Unit III

Naming & Addressing

Hierarchical Naming, Addressing, Telephone Networks, Internet, IPv4, Subnetting Ipv4 Networks, Private Networks, Asynchronous Transfer Mode, Name Resolution, Address Resolution Protocol (Arp), RARP Networking Topologies: Network Services, Transmission Media, Connectivity Devices, Network Protocols & Models, Servers and clients, Introductions to the OSI Model, the Physical Media, the Data Link Layer, Data Transmission, The Network Layer, The transport Layer, The Session Layer, Lower Layer Protocols, Bridging, Switching & routing, TCP/IP Network, Directory Services, Remote Access Protocols, Network Security and fault Tolerance, Preparing for Network Installation, Main ting the Network, Troubleshooting the Network.

Unit IV

Basics of Networking

Basic Networking Knowledge, LAN Vs. WAN, Primary Network Components, Network Topologies, Network Architectures, Network Media, Connectivity Devices, Repeaters, Bridges, Hubs, Routers, Brouters, Gateways. Operating System: Introduction to the Window 9x Family of Products, Introduction to Windows 9x Networking, Windows 9x Architecture, Supporting Printers, Troubleshooting Windows 9x, Introduction to the Windows 2000 Family of Products, The Windows 2000 Boot Process, Windows 2000 System Administration Basics, Introduction

to Networking with TCP IP, Name Resolution Services, Customizing a Windows 2000 Installation, Managing Network Printing, Managing Hard Disks and Partitions, Monitoring and Troubleshooting Windows 2000.

Unit V

Case Study of Windows 2000 or higher

Introduction to administering Windows 2000, Planning & creating User Accounts, Configuring User Profile, Planning & Creating Local & Global groups, Implementing Built-in groups, Managing Account, Managing Domain Controllers, Planning Shared folders, Sharing folders, Planning & assigning NTFS permissions, Auditing resources & events, Installing Windows 2000. Configuring Windows 2000 Environment, Managing System Policy, Managing file system, Creating & Managing Partitions, Implementing fault tolerance, Supporting Applications, Windows 2000 Networking Environment, Configuring WNS, Installing & Configuring DNS, Remote Access Server, Installing Internet Information Server (ISS), Installing & configuring gateway service for netware, Setting up Network Printers, Printers from windows 2000, implementing Netware Clients, Implementing file synchronization & Directory Replications, The Windows 2000 boot Process.

LIST OF PRACTICALS

1. Showing various types of networking cables and connectors, identifying them clearly
2. Looking at specifications of cables and connectors of various companies on Internet, find out differences.
3. Making patch cords using different types of cables and connectors - crimping, splicing, etc
4. Demonstration of different type of cable testers, using them for testing patch cords prepared by the students in Lab and standard cables prepared by professionals
5. Configuring computing devices (PC, Laptop, Mobile, etc) for network, exploring different options and their impact – IP address, gateway, DNS, security options, etc
6. Showing various networking devices – NICs, Hub, Switch, Router, WiFi access point, etc.
7. Looking at specifications of various networking devices various companies on Internet, find out differences.
8. Network simulation tool (e.g. Cisco Packet Tracer)

9. Setting up a small wired LAN in the Lab
10. Setting up a small wireless LAN in the Lab
11. Install & Test Network Interface Card.
12. Prepare and Test Straight UTP Cable.
13. Prepare and Test Cross UTP Cable.
14. Develop a small Network. (Hands on Training.)
15. Install Windows 2003/Windows 2008 Network operating System
16. Install & Configure File Server / Print Server / Mail Server / Proxy Server / Web Server.
17. Install & Test Router, Repeater and Bridge.
18. Install a small wireless network using access points.
19. Set, Configure & Test Internet.

RECOMMENDED BOOKS

1. Computer Networks & David J Wetherall, Andrew S Tannebaum, Pearson, 2012
2. Information Technology Today, S. Jaiswal, Galgotia Publications
3. Computer Networks, Bhushan Trivedi, Oxford University Press, 2013
4. Data Communication & Networking, Forouzen, Tata McGraw Hill, 2016
5. Data & Computer Communication, Williams Stallings, Prentice Hall of India
6. Networks for Computer Scientists and Engineers, Youlu Zheng & Shakil Akhtar, Oxford University Press, 2012

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

1.5 COMPUTER FUNDAMENTALS

L T P
2 - 6

RATIONALE

The aim of this course is to provide adequate knowledge about computer hardware. By acquiring adequate knowledge of this subject student may be able to understand the hardware functioning of the computer and also get an over all idea of the computer system organization. The student will be able to undertake maintenance and repair tasks of computer hardware.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Understand the different types of hardware units of computer system
- Understand the working philosophy of computer system
- understand the basic structure, operation and characteristics of digital computer.
- Understand the hierarchical memory system including cache memories
- know the different ways of communicating with I/O devices and standard I/O interfaces

DETAILED CONTENTS

UNIT I

Introduction

Characteristics of Computers; The Evolution of Computers; The Computer Generations (First Generation (1942-1955), Second Generation (1955 – 1964), Third Generation (1964 – 1975), Fourth Generation (1975 – 1989), Fifth Generation (1989 – Present)). Basic Computer Organization: Input Unit; Output Unit; Storage Unit; Arithmetic Logic Unit; Control Unit; Central Processing Unit; The System Concept.

UNIT II:

Processor and Memory

The Central Processing Unit (CPU) (The Control Unit, The Arithmetic Logic Unit (ALU), Instruction Set, Registers, Processor Speed, Types of Processors); The Main Memory (Storage Evaluation Criteria, Main Memory Organization, Main Memory Capacity, RAM, ROM, PROM and EPROM, Cache Memory.

Unit III

Secondary Storage Devices

Sequential and Direct-Access Devices; Magnetic Tape (Basic Principles of Operation, Types of Magnetic Tapes, Advantages and Limitations of Magnetic Tapes, Uses of Magnetic Disks); Optical Disk (Basic Principles of Operation, Types of Optical Disks, Advantages and Limitations of Optical Disks, Uses of Optical Disks); Mass Storage Devices (Disk Array, Automated Tape Library, CD-ROM Jukebox); Storage Hierarchy.

Unit IV

Input-Output Devices

Input Devices (Keyboard Devices, Point-and-Draw Devices, Data Scanning Devices, Digitizer, Electronic Card Reader, Voice Recognition Devices, Vision-Input System); Output Devices (Monitors, Printers, Plotters, Screen Image Projector, Voice Response Systems).

Unit V

Application Software Packages

Word-Processing Package (What it is?, Commonly Supported Features); Spreadsheet Package (What it is?, Commonly Supported Features); Graphics Package (What it is?, Commonly Supported Features); Personal Assistance Package (What it is?, Commonly Supported Features). Classification of Computers: Notebook Computers; Personal Computers (PCs); Workstations; Mainframe Systems; Supercomputers; Clients and Servers.

LIST OF PRACTICALS

1. Introduction: Machine Hardware (Traps and Interrupts, Multimode Execution);
2. Operating System Structure (Operating System Types, Operating System Kernel, The Boot Process).
3. MS-DOS: Basics of OS, functions of OS, DOS as OS, Getting started with MS-DOS, Starting PC; Booting sequence, Types of commands, Internal & external, reserve words, typing a command (Syntax of command) Files in MS-DOS: Naming a file, permissible characters and extensions, reserve words, creating a file with copy con .

4. Commands like TYPE, COPY, RENAME, DEL, DATE, TIME, ATTRIB. Directory Handling: MKDIR, CHDIR, RMDIR, TREE, SUBST, DELTREE, PATH, APPEND, editing files with Edit, cut, copy & Paste, search with find.
5. Disk Maintenance: Format, Diskcopy, XCOPY, DISKCOPY, BACKUP RESTORE, LABEL, VOL. Batch File: REM, ECHO, FOR, PAUSE, IF, GOTO replacable parameters %1 to %9 & %* Autoexec.bat. Command: Special features: redirection and filters; piping, MORE, SORT, FIND commands.
6. Config. Sys: Device Drivers, MEM managements, files Buffers, High memory area. UNIX Overview: Unix Architecture; Kernal, process, Time sharing, Shell, files and directories creation of file, file security, peripheral devices as files, inodes.

RECOMMENDED BOOKS

1. Rajaraman V. - Fundamentals of Computers – PHI
2. Computer System Architecture, Morris Mano, PHI
3. Structured Computer Organization, Tanenbaum (PHI)
4. Computer Organization and Architecture, Stallings (PHI)

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

2.1 ON SITE OR IN HOUSE TRAINING

L	T	P
-	-	2

RATIONALE

On site or In house six weeks training will improve skills with specific hardware, software, applications or social media. It will also help the diploma student to understand how certain technologies are used in specific industries or companies.

LEARNING OUTCOMES

After undergoing this training, students will be able to:

- Develop Professional behaviour
- Develop Project related skills
- Gain experience to add to resume
- Improve confidence, competency in specific areas
- Expand network with company or industry

2.2 FOUNDATIONS OF INFORMATION TECHNOLOGY

L	T	P
2	-	4

RATIONALE

Information technology has great influence on all aspects of life. Almost all work places and living environment are being computerized. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Understand the basic components of Computers, Internet and issues of abuses/ attacks on information and computers
- Use the comfortably computer/laptop/mobiles/Internet Utilities and Install/Configure OS
- Assemble a PC and Connect it to external devices
- Work with Office Automation Tools
- Create worksheets and Prepare presentations

DETAILED CONTENTS

UNIT I

Basic Internet Skills

Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals. General understanding of various computer/laptop hardware components – CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

UNIT II:

Working with IT Tools

Working with Mobile Applications – Searching for Authentic Mobile app, Installation and Settings, Govt. of India Mobile Applications. OS Installation - Linux and MS Windows, Unix Shell and Commands – Introducing the shell, Commands for files and directories, commands

for finding the things, commands for pipes and filters, writing a sample shell script using vi editor.

Unit III

Basics of WWW

HTML4 – List of Tags in HTML4, Div and Span Tags for Grouping, Lists in HTML, Tables and Forms in HTML, Writing a simple HTML based webpage and making basic personal webpage, Effective use of Gmail, G-Drive, Google Calendar, Google Sites, Google Sheets, Online mode of communication using Google Meet & WebEx

Unit IV

Office Tools

Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing, Content Management tools using WordPress, Effective use of Social Media like LinkedIn, Google+, Facebook, Twitter, etc.

Unit V

Use of Social Media

Introduction to Information Security and Cyber Crime – Simple examples and case studies

LIST OF PRACTICALS

1. **PC Hardware:**

   Observe and study various cables, connections and parts used in computer communication, various cards used in a system viz. display card, LAN card etc., Study on hard disk, study and replace CD ROM drive, monitor, its circuitry printer assembly and elementary fault detection of DMP and laser printers, keyboard and mouse, assemble a PC, Troubleshooting related to various components of computer like monitor, drives, memory and printers etc., Operating systems: Microsoft Windows, Linux and Macintosh

2. **Networking**

   Communication and Transmission Devices such as Modems, hubs, switches, routers, gateways, twisted pair cables, optic fiber, radio wave communication, Associated software Communication modes, Features of Networking, Communication

Protocols, Topology: Ring, Star, Bus, etc, Types of Networks: Local Area, Metropolitan Area, Wide Area Networking, Wireless Network: Wide Area Networking, Value added Networking.

3. **Network Administration**

Holding & protecting Supervisor password, Protecting access to sensitive files, Allocation of user login, password and access rights, Control on unauthorized user activities Day to day management of user requirements, Vigilance over unauthorized programs, failed attempts to access, Steps to prevent hacking & wiretapping, Password control, Maintenance of Audit trail logs, Physical control on access to servers & console

4. **Internet and world wide Web**

Orientation & Connectivity Boot Camp, Local Area Network and access the Internet, configure TCP/IP setting, customize web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blocker configure plug-ins like Macro media Flash and JRE for applet, install an antivirus software, configure personal firewall and windows update on computer, customize browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

5. **Microsoft Office / Equivalent FOSS Tools**

Working with MS/equivalent FOSS tool Word, MS/equivalent (FOSS) tool Excel. MS/equivalent (FOSS) tool Power Point, MS/equivalent (FOSS) tool Publisher

RECOMMENDED BOOKS

1. R.S. Salaria, Computer Fundamentals, Khanna Publishing House
2. Ramesh Bangia, PC Software Made Easy – The PC Course Kit, Khanna Publishing House
3. Online Resources, Linux man pages, Wikipedia
4. Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew Mallett
5. Vikas Gupta (2008), Comdex Hardware and Networking Course Kit, DreamTech press, New Delhi, India.

6. Sumitabha Das (2008), UNIX concepts and applications, 4th Edition, Tata McGraw Hill, New Delhi, India.

RECOMMENDED WEBSITES / SOFTWARES

1. https://nptel.ac.in/courses/106/106/106106222/ - NPTEL Course on Modern Application Development
2. https://onlinecourses.swayam2.ac.in/aic19_de01/preview -
3. https://spoken-tutorial.org/ - Tutorials on Introduction to Computers, HTML, LibreOffice Tools, etc.
4. NOTEPAD++
   https://tms-outsource.com/blog/posts/web-development-ide/

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

2.3 DATABASE SYSTEMS

L T P
2 - 4

RATIONALE

This subject is to get broad understanding of the basic concepts of database management system in particular relational database system. The students will also develop the skills to design database system and develop application programs to manage & retrieve data from different perspective.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Understand database concepts, applications, data models, schemas and instances.
- Implement the relational database design and data modelling using entity-relationship (ER) model.
- Use of SQL in querying the database
- Apply the new emerging Technologies and Applications in database.

DETAILED CONTENTS

UNIT I

Introduction to Databases, DBMS and RDBMS : Introduction, Information, Quality of Information, Information Processing, What is a Database?, Why a Database?, Characteristics of Data in a Database, What is a Database Management System (DBMS)?

UNIT II:

Need for DBMS, Types of DBMS, Relational Database Management Systems (RDBMS), RDBMS Terminology, Relational Data Structure, Relational Data Integrity

Unit III

Introduction to Structured Query Language (SQL): Introduction, Characteristics of SQL, Advantages of SQL, Types of SQL Tables, Create Table, NULLS, Data Manipulation, Update Operations

Unit IV

SQL in Access., SELECT Queries in QBE, Make-Table Query, DELETE Query, UPDATE Query, APPEND Query

Unit V

Functional dependencies and normalization for relational databases.

LIST OF PRACTICALS

1. **ACCESS 2000 BASICS:** Introduction, Starting Access 2000, Opening an existing database, Opening the sample north window database, What is a database?, Managing database objects Access Startup Dialog Box, Menus and Toolbars, Using Toolbar Buttons, Arranging Buttons on the Toolbar, Viewing Data, Creating an Access 2000 Database and Tables, Database Properties, Modifying Tables, Creating Forms, Entering and Updating Data Using Forms, Navigating between Records in a Form, Finding, Editing and Deleting Data in a Form, Using Access 2000 Help, Using Answer Wizard, Using the Contents Tab to Get Help, Using the Index Tab to ger Help, Exercises.
2. **UNDERSTANDING DATABASES:** Why store data, You use tables to store data, Terminology time, Why use multiple tables?
3. **CREATING DATABASES:** Introduction, Database is not a table, Creating a blank database, Using the file new database dialog box,
4. **CREATING TABLES:** Using the table wizard, Object naming rules, Planning a table from scratch, Creating a table without using a wizard, Defining a tables fields, Choosing appropriate data types, Defining field propertiesm, Setting a primary key, Defining indexes, Saving a table structure, Switching between design and datasheet views, Changing properties, About lookup fields
5. **ADDING, EDITING AND VIEWING DATA:** Datasheet view and form view, Changing the datasheet appearances, Navigating forms and datasheets, Changing data in a table, Deleting data, Copying and moving data, Special techniques for memo fields, Duplicate key message, Null value in index, Validation rule, Changing the table design from datasheet view, Creating a table from a blank datasheet
6. **QUERIES:** Introduction, What queries let you do, Types of queries, Creating a query, Viewing the dynaset, Running an action query, Refining your query, Changing field

properties, Creating crosstab queries, Creating action queries, Update queries, Make table queries Sorting and Filtering Records, Creating and Printing Reports, Creating and Using Queries.

7. **CREATING FORMS:** Creating forms with form wizards, Making hierarchical forms work properly, Charts, Pivot tables, Using wizards, Saving a form, Opening and using a form, Getting around in hierarchical forms, Changing the style
8. **CREATING REPORTS:** Introduction, Kinds of reports, Groups, totals and summary reports, When the report wizard needs your help, Charts, Using wizards to create a report, Creating mailing labels, Formatting postal codes and phone numbers, Saving a report, Opening a report, Removing a filter and sort order, Changing the style for a report
9. **CASE STUDIES:** Employee database, Visitor Management database, Students Academic database, Inventory Management System database, Bank Operations database

RECOMMENDED BOOKS

1. Database Systems Concepts, design and Applications, 2/e, Singh, S. K., Pearson Education, New Delhi, 2011
2. SQL/ PL/SQL Bayross, Ivan BPB, New Delhi, 2010.
3. An Introduction to Database Systems Date, C. J. Pearson Education, New Delhi,2006
4. Database System Concepts, Korth, Henry McGrawHill, Delhi, 2011
5. Introduction to Database Systems ITL ESL. Pearson Education, New Delhi, 2010

RECOMMENDED WEBSITES / SOFTWARES

1. DBMS: http://nptel.iitm.ac.in/video.php?subjectId=106106093
2. SQL Plus Tutorial: http://holowczak.com/oracle-sqlplus-tutorial/
3. Database Tutorials:http://www.roseindia.net/programming-tutorial/DatabaseTutorials
4. SQL Basic Concepts: http://www.w3schools.com/sql/
5. SQL Tutorial : http://beginner-sql-tutorial.com/sql.htm

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

2.4 APPLICATION DEVELOPMENT

L	T	P
2	-	4

RATIONALE

Desktop Application development is an important skill required for any computer professionals. The students of diploma in computer science as web developers would be able to write dynamic interactive web based applications. After mastering this course they may work as self-employed web page developer.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Create small programs using basic PHP concepts.
- Apply In-Built and Create User defined functions in PHP programming.
- Design and develop a Web site using form controls for presenting web based content.
- Debug the Programmes by applying concepts and error handling techniques of PHP.
- Create dynamic Website/ Web based Applications, using PHP, MySQL database

DETAILED CONTENTS

UNIT I

Introduction to PHP

Configuration of PHP, Apache Web Server, MySQL and Open Source, Relationship between Apache, MySQL and PHP(AMP Module), Installing PHP for (Windows, Wamp server ,XAMP server), PHP Structure and Syntax, Creating PHP pages, Rules of PHP syntax, Integrating HTML with PHP, Constants , Variables: Static and Global Variable, Conditional Structure and Looping, PHP operators, Arrays, constructs, User Defined function, argument function, variable function, Return function, default argument, variable length argument

UNIT II:

Working with In Built Functions

Variable Function: (gettype, settype, isset, strval, floatval, intval,print_r); string function: (Chr, ord, strtolower, strtoupeer, strlen, ltrim, rtrim, trim, substr, strcmp, strcasecmp, ctrops, strops, stristr, str_replace, strrev, echo, print); MATH functions: (Abs, ceil, floor, round,fmod, min,

max, pow, sqrt, rand); Date function: (Date, getdate, setdate, checkdate, time, mktime); Array Function: (Count, list, in_array, current, next, previous, end, each, sort, array_merge, array_reverse); File function: (Fopen, fread, fwrite, fclose)

Unit III

Working with data and forms

Reading data using Form Controls (Text Fields, Text Areas, CheckBoxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads, Buttons); Submitting form values, using $_Get and $_Post Methods, $_REQUEST; Accessing form inputs with Get/Post functions; Combining HTML and PHP codes together on single page, Redirecting the user.

Unit IV

Session, Cookies and Error Handling

Setting a cookie with PHP, Deleting a cookie; Creating session cookie; Working with the query string Creating query string; Session, Starting and Destroying session; Working with session variables, Passing session IDs, Error Types in PHP, Exception Handling in PHP.

Unit V

Database Connectivity using MYSQL

Concepts and Installation of MySQL; MySQL structure and syntax; Types of MySQL ables and Storage engines; MySQL commands; Integration of PHP with MySQL; Connection to the MySQL Database; Creating and Deleting MySQL database using PHP; Updating, Inserting, Deleting records in the MySQL database; Hosting Website (Using 'C' panel, Using Filezilla Software)

LIST OF PRACTICALS

1. Write a PHP script to display Welcome message.
2. Write a PHP script to demonstrate arithmetic operators, comparison operator, and logical operator.
3. Write PHP Script to print Fibonacci series.
4. Write PHP Script to generate result and display grade.
5. Write PHP Script to find maximum number out of three given numbers.

6. Write PHP Script for addition of two 2x2 matrices.
7. Write PHP script to demonstrate Variable/String/Date/Math/Array/File functions.
8. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
9. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
10. Write two different PHP script to demonstrate passing variables through a URL.
11. Write two different PHP script to demonstrate passing variables with sessions.
12. Write PHP script to demonstrate passing variables with cookies.
13. Write a program to keep track of how many times a visitor has loaded the page.
14. Write an example of Error-handling using exceptions.
15. Write a PHP script to connect MySQL server from your website.
16. Write a program to read customer information like cust_no, cust_name, Item_purchase, and mob_no, from customer table and display all this information in table format on output screen.
17. Write a program to edit name of customer to "Bob" with cust_no =2, and to delete record with cust_no=4.
18. Write a program to read employee information like emp_no, emp_name, designation and salary from EMP table and display all this information using table format.
19. Create a dynamic web site using PHP and MySQL.

RECOMMENDED BOOKS

1. Beginning PHP and MySQL, 4th Edition W. Jason Gilmore Apress, 2010
2. PHP: The Complete Reference Steven Holzner McGraw-Hill, 2008
3. Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition Robin Nixon O'reilly Media , 2014
4. Teach yourself PHP, MySQL and Apache All in One , 5th Edition Julie C. Meloni, Pearson Education, 2012

RECOMMENDED WEBSITES / SOFTWARES

1. http://www.codecademy.com/tracks/web ,
2. http://www.codecademy.com/tracks/php
3. http://www.w3schools.com/PHP

4. http://www.tutorialpoint.com
5. http://www.homeandlearn.co.uk

Note: This subject contains five units of 20 % equal weight age with more than 60% hands on practice sessions for effective skill development.

2.5 PROJECT WORK

L	T	P
-	-	20

RATIONALE

Industry Based Project Work / Internship aims at developing innovative skills in the students whereby they apply the knowledge and skills gained through the course by undertaking a project. The individual students have different aptitudes and strengths. Project work, therefore, should match the individual strengths of students. The prime emphasis of the project work is to understand and apply the basic knowledge of the principles of software engineering practices in real life situation.

LEARNING OUTCOMES

After undergoing the subject, the student will be able to:

- Develop software packages or applications and implement these for the actual needs of the community/industry.
- Explain the working of industrial environment and its work ethics.
- Explain what entrepreneurship is and how to become an entrepreneur.
- Identify and contrast gap between the technological knowledge acquired through curriculum and the actual industrial need.
- Field computing and to achieve real life experience in computer application.

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RECOMMENDED PROJECT AREAS

1. Installation of computer systems, peripherals and software
2. Programming customer based applications
3. Web page designing including database connectivity
4. Database applications
5. Networking
6. Fabrication of components/equipment (computer related components)
7. Fault-diagnosis and rectification of computer systems and peripherals
8. Bringing improvements in the existing systems/equipment

9. Projects related to Computer Graphics
10. Web Hosting
11. Configuration of Network Operating System(Windows, Linux)
12. Configuration of servers (Proxy, DNS etc)
13. Data analysis
14. Data acquisition through multiple interfaces.
15. Any other related area found worth.

10. EVALUATION STRATEGY

10.1 INTRODUCTION

Evaluation plays an important role in the teaching-learning process. The major objective of any teaching-learning endeavor is to ensure the quality of the product which can be assessed through learner's evaluation. The purpose of student evaluation is to determine the extent to which the general and the specific objectives of curriculum have been achieved. Student evaluation is also important from the point of view of ascertaining the quality of instructional processes and to get feedback for curriculum improvement. It helps the teachers in determining the level of appropriateness of teaching experiences provided to learners to meet their individual and professional needs. Evaluation also helps in diagnosing learning difficulties of the students. Evaluation is of two types: Formative and Summative both Internal and External Evaluation.

Formative Evaluation

It is an on-going evaluation process. Its purpose is to provide continuous and comprehensive feedback to students and teachers concerning teaching-learning process. It provides corrective steps to be taken to account for curricular as well as co-curricular aspects.

Summative Evaluation

It is carried out at the end of a unit of instruction like topic, subject, semester or year. The main purpose of summative evaluation is to measure achievement for assigning course grades, certification of students and ascertaining accountability of instructional process. The student evaluation has to be done in a comprehensive and systematic manner since any mistake or lacuna is likely to affect the future of students. In the present educational scenario in India, where summative evaluation plays an important role in educational process, there is a need to improve the standard of summative

evaluation with a view to bring validity and reliability in the end-term examination system for achieving objectivity and efficiency in evaluation.

10.2 STUDENTS' EVALUATION AREAS

The student evaluation is carried out for the following areas:

1. Theory
2. Practical Work (Laboratory, Workshop, Field Exercises)
3. Project Work
4. Professional Industrial Training

1. Theory

Evaluation in theory aims at assessing students' understanding of concepts, principles and procedures related to a course/subject, and their ability to apply learnt principles and solve problems. The formative evaluation for theory subjects may be caused through sessional /class-tests, home-assignments, tutorial-work, seminars, and group discussions etc. For end-term evaluation of theory, the question paper may comprise of three sections.

Section-I

It should contain objective type items e.g. multiple choice, matching and completion type. Total weightage to Section-1 should be of the order of 20 percent of the total marks and no choice should be given in this section. The objective type items should be used to evaluate students' performance in knowledge, comprehension and at the most application domains only.

Section-II

It should contain short answer/completion items. The weightage to this section should be of the order of 40 percent of the total marks. Again, no choice should be given in section-II

Section-III

It may contain two to three essay type questions. Total weightage to this section should be of the order of 40 percent of the total marks. Some built-in, internal choice of about 50 percent of the questions set, can be given in this section

2. Practical Work

Evaluation of students performance in practical work (Laboratory experiments, Workshop practicals/field exercises) aims at assessing students ability to apply or practice learnt concepts, principles and procedures, manipulative skills, ability to observe and record, ability to interpret and draw conclusions and work related attitudes. Formative and summative evaluation may comprise of weightages to performance on task, quality of product, general behaviour and it should be followed by viva-voce.

3. Project Work

The purpose of evaluation of project work is to assess students ability to apply, in an integrated manner, learnt knowledge and skills in solving real life problems, manipulative skills, ability to observe, record, creativity and communication skills. The formative and summative evaluation may comprise of weightage to nature of project, quality of product, quality of report and quality of presentation followed by viva-voce.

4. In-house or On site Industrial Training

Evaluation of professional industrial training report and viva-voce/ presentation aims at assessing students' understanding of materials, industrial processes, practices in the industry/field and their ability to engage in activities related to problem-solving in industrial setting as well as understanding of application of learnt knowledge and skills in real life situation. The formative and summative evaluation may comprise of

weightages to performance in testing, general behaviour, quality of report and presentation during viva-voce.

11. RECOMMENDATIONS FOR EFFECTIVE IMPLEMENTATION

This curriculum document is a Plan of Action (PoA) and has been prepared based on exhaustive exercise of curriculum planning and design. The representative sample comprising selected senior personnel (lecturers and HODs) from various institutions and experts from industry/field have been involved in curriculum design process. The document so prepared is now ready for its implementation. It is the faculty of academic institutes who have to play a vital role in planning instructional experiences for the courses in four different environments viz. class-room, laboratory, library and field and execute them in right perspective. It is emphasized that a proper mix of different teaching methods in all these places of instruction only can bring the changes in stipulated students behaviour as in the curriculum document. It is important for the teachers to understand curriculum document holistically and further be aware of intricacies of teaching-learning process (T-L) for achieving curriculum objectives. Given below are certain suggestions which may help the teachers in planning and designing learning experiences effectively. These are indicative in nature and teachers using their creativity can further develop/refine them. The designers of the programme suggest every course teacher to read them carefully, comprehend and start using them.

(A) Broad Suggestions:

1. Curriculum implementation takes place at programme, course and class-room level respectively and synchronization among them is required for its success. The first step towards achieving synchronization is to read curriculum document holistically and understand its rationale and philosophy.

2. Board may make the academic plan available to all academic institutes well in advance. The Principals have a great role to play in its dissemination and, percolation upto grass-root level. Institutes in turn are supposed to prepare institutional academic plan by referring Board plan.

3. HOD of every Programme Department are required to prepare academic plan at department level referring institutional academic plan.

4. All lecturers/Senior lecturers are required to prepare course level and class level lesson plans referring departmental academic plan.

(B) Course Level Suggestions

Teachers are educational managers at class room level and their success in achieving course level objectives lies in using course plan and their judicious execution which is very important for the success of programme by achieving its objectives. Teachers are required to plan various instructional experiences viz. theory lecture, expert lectures, lab/workshop practicals, guided library exercises, field visits, study tours, camps etc. In addition, they have to carry out progressive assessment of theory, assignments, library, practicals and field experiences. Teachers are also required to do all these activities within a stipulated period which is made available to them in the academic plan at Board level. With the amount of time to their credit, it is essential for them to use it judiciously by planning all above activities properly and ensure execution of the plan effectively.

Following is the gist of suggestions for subject teachers to carry out T-L process effectively:

1. Teachers are required to prepare a course plan, taking into account departmental academic plan, number of weeks available, course to be taught, different learning experiences required to be developed etc.

2. Teachers are required to prepare lesson plan for every theory class. This plan may comprise of content to be covered, learning material (transparencies, VCDs, Models etc.) for execution of a lesson plan. They may follow steps for preparing lesson plan e.g. deliver planned subject content, check desired learning outcome and reinforce learning etc.

3. Teachers are required to plan for expert lectures from field/industry. Necessary steps are to plan in advance, identify field experts, make correspondence to invite them, take necessary budgetary approval etc.

4. Teachers are required to plan for guided library exercises by identification of course specific experience requirement, setting time, assessment, etc. The tutorial, assignment and seminar can be thought of as terminal outcome of library experiences.

5. Concept and content based field visits with appropriate releases may be planned and executed for such content of course which otherwise is abstract in nature and no other requisite resources are readily available in institute to impart them effectively.

6. There is a dire need for planning practical experiences in right perspective. These slots in a course are the avenues to use problem based learning/activity learning/ experiential learning approach effectively. The development of lab instruction sheets for the course is a good beginning to provide lab experiences effectively.

7. Planning of progressive assessment encompasses periodical assessment in asemester, preparation of proper quality question paper, assessment of answer sheets immediately and giving constructive explicit feed back to every student. It has to be planned properly; otherwise very purpose of the same is lost.

8. The co-curricular activities like camp, social gathering, study tour, hobby club etc. may be used to develop generic skills like task management, problem solving, managing self, collaborating with others etc.

9. Where ever possible, it is essential to use activity based learning rather than relying on delivery based conventional teaching all the time.

10. While imparting instructions, emphasis may be laid on the development of cognitive, psychomotor, reactive and interactive skills in the students.

11. Teachers may take working drawings from the industry/field and provide practices in reading these drawings.

12. Considerable emphasis should be laid in discipline specific contracting and repair and maintenance of machines, tools and installations.

13. Teachers may take initiative in establishing liaison with industries and field organizations for imparting field experiences to their students.

14. Students be made aware about issues related to ecology and environment, safety, concern for wastage of energy and other resources etc.

15. Students may be given relevant and well thought out project assignments, which are purposeful and develop practical skills. This will help students in developing creativity and confidence for their gainful wage and self employment.

16. A Project bank may be developed by the concerned department in consultation with related Industry, Research Institutes and other relevant field organizations in the state.

12. LIST OF EXPERTS

S. No.	Name, Designation and Affiliation
From Field/Industries/Academic Institues	
1	Dr. D P Singh, Director, IED, UP
2	Dr. Sumit Verms, Chairman, Concept Education Trust
3	Dr. Kuldeep Yadav, Professor, DTE, UP
4	Mr. Janmejai Kumar, Lecturer, DTE, UP
5	Mr. Varun Yadav, Lecturer, DTE, UP
6	Dr. K G Srinivasa, Professor, NITTTR, Chandigarh
7	Dr. Rajesh Mehra, Coordinator, NITTTR, Chandigarh