

PGDCA

Annexure I
Parvatibai Chowgule College of Arts and Science
(Autonomous)
DEPARTMENT OF COMPUTER SCIENCE
COURSE STRUCTURE
Post Graduate Diploma in Computer Applications(PGDCA)

Semester I (20 credits)

Paper Code	Paper Type	Paper Name	Credits	Student (hrs/week)	
				L	P
DCA11	Core – I	C Programming	4	3	1
DCA12	Core – II	DataBase Management Systems	4	3	1
DCA13	Core – III	Client Side Technologies	4	3	1
DCA14	Elective – I	Elective Paper I	4	3	1
DCA15	Elective - II	Elective Paper II	4	3	1

Semester II (20 credits)

Paper Code	Paper Type	Paper Name	Credits	Student (hrs/week)	
				L	P
DCA21	Core – IV	Computer Networking	4	3	1
DCA22	Core – V	Software Engineering	4	3	1
DCA23	Elective III	Elective Paper III	4	3	1
DCA24	Elective – IV	Elective Paper IV	4	3	1
DCA25	Elective V	Elective Paper V	4	3	1

L – Lectures ---> 1 Hour Duration

P – Practicals --->2 Hours Duration

List of Elective Papers

1. Multimedia
2. E-Learning
3. Python Programming
4. HCI
5. E-commerce
6. Digital Marketing
7. Network Administration
8. Object Oriented Programming
9. Software Testing
10. Server Side Programming
11. Data Structures
12. Accounting and Financial Management

Parvatibai Chowgule College of Arts and Science
(Autonomous)
Margao, Goa

Semester I & Semester II Syllabi for

PGDCA

(2016-2017)

Paper Title : C Programming

Paper Code : DCA11

Marks : 75

Credits : 3

Course Prerequisites : Nil

Course Objectives:

- To make the student understand the concept of computer algorithm and use the algorithm for various problem solving.
- To implement algorithms using high level programming language.
- To understand basic principles of structured programming using C

Learning Outcomes:

On completion of the course students will learn the following:

- Designing algorithm for a given problem
- Writing C Programs to implement algorithms

Syllabus

1. Introduction to Computer Problem Solving: [7L]

Algorithm, Flowchart, The Problem Solving Aspect, General problem solving strategies, Top-Down Design, Implementation of Algorithms, Efficiency of Algorithms, Analysis of Algorithm, Recursive algorithms.

2. Basic Algorithms: [3L]

Exchanging the values, Summation of a set of numbers, factorial computation, generation of the Fibonacci series, reversing the digits of an integer, base conversion.

3. Factoring Methods : [3L]

Finding divisors of an integer, finding the Greatest Common Divisor of two integers, generating prime numbers, computing prime factors of an integer.

4. Sorting and Searching algorithms : [2L]

Bubble sort, Insertion Sort, Sequential Search and Binary Search.

5. Introduction to 'C': [4L]

History, Structure of a C program, Keywords, Identifiers, variables, constants, data types, Arithmetic Operators & Expressions, Logical operators and Relational Operators, Precedence and Associativity rules.

6. Conditions and Iterations : [4L]

Conditions and Actions, Condition statement, Simple control statement (*if, if-else, switch*), Iterative control statements (*for, while, do-while*)

7. Functions: [6L]

What is a function, Advantages of functions, Standard library functions, User defined functions – declaration, definition, function call, parameter passing, return keyword. Scope of variables, Storage classes, Recursion.

8. Arrays: [5L]

One and Two dimensional arrays: Array declaration, initialization, accessing the values

9. Strings : [5L]

Declaration and initialization, standard library string functions, array of strings.

10. Structures: [4L]

Creating structures, accessing structure members, array of structures, passing structure to functions, nested structure

11. Preprocessing: [2L]

Format of Preprocessor directive, File Inclusion directive, Macro substitution, conditional compilation

Text Books:

1. Dromey R.G., How to solve it by computer, Prentice Hall of India, 2nd Edition, 2004.
2. Yeshwant Kanetkar, Let us C, BPB Publications, 13th Edition, 2012.
3. Behrouz Forouzan, Richard Gilberg, Computer Science: A Structured Programming Approach using C, Cengage Learning, 3rd Edition, 2013.

Reference books:

1. Horowitz Ellis, Sahni Satraj, Sanguthevar Rajasekaran , Fundamentals of computer algorithm, Orient Longman, 2nd Edition, 2008.
2. Gottfried Byron, Programming with C, Tata McGraw Hill, 3rd Edition, 2010.
3. Brain W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall India, 2nd Edition, 1988.

Lab : C Programming

Credit : 1

Marks : 25

Programs using C language that covers the following concepts :

1. Program to compute a given formula.
2. Conditions
 - if..else
 - nested if
3. Iterative Control Statements
 - for
 - while
 - do...while
4. Functions.
 - Standard Library functions
 - Call by Value
5. Recursive functions.
6. Arrays.
 - One Dimensional Arrays
 - Two Dimensional Arrays
7. Sorting
 - Bubble sort
 - Insertion sort
8. Searching.
 - Sequential search
 - Binary search
9. Strings.
 - Standard Library string functions
 - String Processing

10. Array of Strings.

11. Structure.

- Array of structures
- Passing Structure to functions
- Nested structure

12. C Preprocessing.

- Macro expansion
- Conditional compilation

Paper Title: Data Base Management Systems

Paper Code: DCA12

Marks: 75

Credits: 3

Course Prerequisites: -

--Nil--

Course Objectives:

It provides basic knowledge of a database management system. It helps to understand importance of ER diagram. It introduces SQL to query a database.

Learning outcome:

- On completion of the course students will learn Database concepts and structures. They will be able to explain terms related to database design and management. Students will understand data modeling and database development process.
- Students will be able to construct and normalize data models and implement the same using any Relational Database Management System.
- Students will become proficient in using database query language, i.e. SQL.

Syllabus

1. Overview of database management

[7L]

Data, information, database, database management system; Managing data; File systems versus a DBMS, advantages of a DBMS; Data abstraction, instances and schemas, data models; Data manipulation language, data definition language; Architecture of a DBMS; Users of a DBMS, database administrator

2. Database design and the ER model

[10L]

Design phases – conceptual design, logical design, physical design; ER model – entities, attributes, and relationships, mapping cardinalities, keys; ER diagrams –

strong entities, weak entities, generalization, specialization, aggregation; Converting ER diagram to relational schemas

3. Relational model [9L]

Relation, properties of relational model; Entities, integrity constraints, referential integrity constraints; Relational algebra – select, project, cross product, set operations, rename operation; Other relational operations – natural join, outer join

4. SQL [10L]

Basic structure of SQL query – Create, select, where, from, rename operation; Set operations; Aggregate functions; Group by, having clauses; Nested queries; Views; Insert, delete, update.

5. Functional dependency and normalization [6L]

Atomic domain, nested relation; Key, super key, primary key, candidate key; Functional dependency, axioms, closure of a set of attributes, closure of a set of functional dependencies; Purpose of normalization; 1NF; 2NF; 3NF; BCNF

6. Introduction to Transactions [3L]

Transaction concept, Transaction state, ACID properties, Concurrent Transactions, Serializability.

Text Book:

- A Silberschatz, H F Korth, S Sudarshan, *Database system concepts*, McGraw-Hill ,sixth Edition

Reference Books:

- Ramakrishan, J Gehrke, “*Database management systems*”, McGraw-Hill , 3rd edition
- R Elmasri, S B Navathe, “*Fundamentals of database Systems*”, Pearson Education , 5th Edition

Lab : Database Management Systems

Credit : 1

Marks : 25

List of Practicals

1. ER diagram
2. ER diagram with specialization/generalization and aggregation.
3. Converting ER diagram to Schemas
4. Converting ER diagram with generalization/specialization, aggregation into schema
5. Studying RDBMS
 - a. Understanding Client server architecture
 - b. Creating tables
6. SQL

7. SQL
8. Introduction of .NET Framework, Advantages of .Net Framework, Components of .NET Framework, Data type & Operators with examples.
8. Loops, Control Statements, Operators, Data Types
9. Controls : Label, Button, Textbox, Picture Box
10. Controls : Radio button, Checkbox, Timer Control, Scroll Bars
11. Controls : List box, Combo Box, Dropdown list etc.
12. Working on Database
13. Working on Database
14. Normalization
15. Report Writing

Paper Title: Client Side Technologies

Paper Code: DCA13

Marks: 75

Credits: 3

Course Prerequisites : Nil

Course Objective:

To develop a high degree of competence as a web designer by learning the client-side techniques.

Learning Outcome:

On completion of the course students will be able to

- Understand basics of Internet.
- Design simple static and dynamic websites.

Syllabus

1. The Internet

[8L]

Computer Networks: LAN, MAN, WAN, etc., Layout (Ring, bus, star, etc.), IP address: public, private, static, dynamic, Internet protocols and services: http, https, ftp, smtp, nntp, etc, Telnet, dns, dhcp, Intranet & Extranet, Internet Infrastructure, Search Engines, Web Browser, Web server

2. Basic HTML:

[14L]

Introduction, importance, Basic: HTML Tag, HEADER Tag, META Tag, TITLE Tag, BODY Tag, Text Formatting: PRE Tag, FONT Tag, entities, Image: IMG tag, image maps, Hyperlinks: Anchor tag, Lists: Unordered Lists, Ordered Lists, Definition Lists, Table tags: TABLE, TR and TD Tags, Cell Spacing and Cell Padding, Colspan and Rowspan, Frames: Frameset, FRAME Tag, NOFRAMES Tag, End user Interaction: FORM and INPUT Tag, Text Box, Radio Button, Checkbox, SELECT Tag and Pull Down Lists, TEXTAREA, Hidden, Submit and Reset, Special Tags : COLGROUP, THREAD, TBODY, TFOOT, blank, self, parent, top, IFRAME, LABEL, Attribute for <SELECT>.

3. HTML5: [6L]

The <canvas> element for 2D drawing, The <video> and <audio> elements for media playback, Support for local storage, New content-specific elements, like <article>, <footer>, <header>, <nav>, <section>, New form controls, like calendar, date, time, email, url, search.

4. CSS: [4L]

Introduction to CSS, Advantages, Types of style sheets: Inline, Internal, External, Multiple Style sheets and Cascading order, Grouping or nesting, Syntax, ID and Class, Pseudo-class, Pseudo-element, CSS units of measurement, Colors.

5. New features in CSS3: [5L]

Selectors, Box Model, Backgrounds and Borders, Image Values and Replaced Content, Text Effects, 2D/3D Transformations, Animations, Multiple Column Layout, User Interface.

6. Client side scripting: [8L]

Introduction to Javascript, HTML DOM, Core Javascript, form validations, introduction to XML, AJAX and JQuery

Text Book:

- Elisabeth Robson, Eric Freeman, “*Head First HTML with CSS & XHTML A Learner's Companion to HTML, CSS and XHTML*”, O'Reilly Media, 1st Edition, 2005.

References:

- Eric Freeman, “*Head First HTML5 Programming*”, O'Reilly Media, 1st Edition, 2011
- Jennifer Niederst, “*Web Design in a Nutshell*”, O'Reilly Media, 3rd Edition, 2006

Lab : Client Side Technologies

Credit: 1

Marks: 25

HTML:

1. Text formats.
2. Image formats.
3. Hyperlink and Listings
4. Table formats (2 practical)
5. Forms

Cascading Style Sheet:

6. Internal and External style implementations
7. Creating Dynamic pages using CSS. (2 practical)

Javascript:

8. Implementing functions in javascript (alert(); confirm(); prompt())
9. Form Validations using Javascript
10. Creating Dynamic pages using Javascript.

HTML5:

11. Web site design using HTML5.
12. Implementation of canvas.
13. Embedding Audio and Video in a Webpage.
14. Implementation of additional form controls.

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Semester II Syllabus for

PGDCA

(2016-2017)

Paper Title : Computer Networks

Paper Code : DCA21

Marks : 75

Credits : 3

Course Prerequisites : Nil

Course Objectives:

- To provide a strong background of network concepts.
- To create a good foundation covering the physical layer, data link layer, network layer and the transport layer.

Learning Outcomes:

On completion of the course students will be able to understand

- Basic types of networks.
- Set up the Local Area Network.
- Network software layers and their functions.
- IP address and their need.
- Internet subnet structure, working principles and protocols.

1. Basics of Computer Networks [7L]

Networking of Computer.- Advantages and disadvantages of computer networking. Types of Networks - LAN, MAN, WAN, Wireless; Network Topology – Star, Ring, Bus, Tree, Complete, Irregular; Reference Models - The OSI reference model, the TCP/IP reference model.

Telephone System: Structure of telephone system, the local loops, trunks and multiplexing (FDM and TDM); Switching - Circuit switching, message switching, Packet Switching.

2. Transmission Media [6L]

Transmission media - Magnetic media, twisted pair, co-axial cable (baseband and broadband), fiber optics principle, transmission of light through fiber, fiber cables, fiber optics network, comparison of fiber optic and copper wire. Wireless Transmission (The electromagnetic spectrum, Radio Transmission, Microwave Transmission, Infrared and Millimeter Waves, Light wave Transmission)

3. Data Communication Components [6L]

Modem, Repeaters, Hubs, Bridges, Switches, Routers, Gateways. Data Link Protocols: Asynchronous, Synchronous, Character Oriented and Bit Oriented Protocols. Error Control, Internet.

4. Medium Access Control Sublayer (MAC): [8L]
Multiple Access Protocols, CSMA Protocols, Collision-Free Protocols (Bit Map protocol, Binary countdown), 802.3 Frame Header, Ethernet: Ethernet Cabling, Manchester Encoding, The Ethernet MAC sublayer protocol, The Binary exponential backoff algorithm, Switched Ethernet, Fast Ethernet, Gigabit Ethernet.

5. IP Addressing [14L]
IP Address class, Network and Host Addressing, Subnet, Subnet Mask. TCP/IP Protocol Suite:

Network Layer: Services, Static vs Dynamic address, Shortest Path Routing Algorithm, IP Protocol Header, Address resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP).

Transport Layer: User Datagram Protocol (UDP), UDP Header, Transmission Control Protocol (TCP), Segment Header, Connection Establishment and Release.

6. Application Layer [4L]
Telnet (TERminal NETwork), HTTP, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP).

Text Book:

- Behrouz A. Forouzan, “*Data Communications and Networking*”, McGraw Hill Education (India) Pvt. Ltd., 4th Edition, 2006.

Reference Books:

- Andrew S. Tanenbaum, “*Computer Networks*”, Prentice Hall of India, 4th Edition, 2002.
- James F. Kurose & Keith W. Ross, “*Computer Networking: A Top-Down Approach, Pearson India*”, 5th Edition, 2012

Lab : Computer Networks

Credit: 1

Marks: 25

1. Installing OS and drivers
2. Cable colour code and crimping, Demonstration of structured cabling
3. Setting up of network (TCP/IP configuration)
4. Sharing resources (files, printer etc)
5. Study of Network Commands
6. Setting up of wireless network (Adhoc and Infrastructure mode)

7. Network monitoring tool
8. Wireshark Tool
9. Network simulator tool1 (2 practical)
10. Network simulator tool2
11. Simulation of Network Protocols using programming language (2 practical)
12. Simple client-server socket program. (2 practical)

Paper Title : Software Engineering

Paper Code : DCA22

Marks : 75

Credits : 3

Course Prerequisites: Nil

Course Objectives:

On completion of the course the students will develop specific skills and competencies to use various software engineering tools and methods to develop software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications.

Learning Outcomes:

- Gain knowledge of concepts & principles, methods and tools used in software engineering with an emphasis on object oriented analysis & design using UML
- Appreciate the role of software engineering in the software development industry.
- Be enabled to use various software engineering methods and tools employed during analysis, design, programming, testing and project management

Syllabus

SOFTWARE PROCESS:

[5L]

Characteristics of software process.

Software Development Processes and Methodologies: waterfall, prototyping, iterative, spiral, unified process.

Benefits of iterative and incremental approach with emphasis on Unified process, CASE Tools, Agile methodologies.

PROJECT MANAGEMENT: [7L]

Planning a Software Project – Cost estimation, Project Scheduling, Software configuration management plans, Quality Assurance plans, Project Monitoring plans and Risk Management. Techniques such as Interviewing , Requirement Workshop, brainstorming, prototyping. Characteristics of SRS

OOAD and UML: [10L]

OOAD: Definition; object oriented analysis; object oriented design and modeling; Assigning responsibilities.

UML: Main UML diagrams – Class diagram , sequence diagram, activity diagram, use case diagram. Use case model – use case diagram , use case descriptions, use case realization using sequence and activity diagrams. Supplementary requirements. Advanced use case model features.

Requirements: Functional and non-functional

System Design : Class diagram, sequence diagram, activity diagram, state chart diagram, deployment diagram. Brief introduction to other UML diagrams.

SOFTWARE ARCHITECTURE PATTERNS: [5L]

Major Architectural Styles (patterns) like Layered Architecture, Pipe and Filter, Shared (Central) Data Store, Event Driven, Model-View-Controller (MVC), “Distributed & Emerging” Service Oriented Architecture (SOA) and Elementary GRASP Patterns.

HUMAN COMPUTER INTERACTION: [4L]

HCI Definition; User categories, Interface Design-Internal & External Interface design, user interface design, Interface design guidelines

CODING: [2L]

Coding styles, standards, peer reviews, checklist,

TESTING: [4L]

Testing Fundamental, Functional Testing, Structural Testing, Testing Object-Oriented Programs, Testing Process and Metrics.

DOCUMENTATION and MAINTENANCE: [4L]

Need for Software Documentation. Types of documentation

Need for Maintenance; Types of Maintenance

REENGINEERING: [4L]

Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering, The Economics of Reengineering

Text Books:

- Roger Pressman, Software Engineering: A Practitioners Approach, McGraw Hill, (6th Edition), 1997.
- Craig Larman, Applying UML and patterns, Addison Wesley, 2nd Edition, 2003

References :

- Pankaj Jalote, An Integrated Approach to Software Engineering, Narosa Publishing House, 2nd Edition
- Glenford J. Myers, “ The Art of Software Testing “, John Wiley & Sons, 1979.
- Sommerville, Software Engineering, Addison Wesley, 7th edition, 1996.
- Martin Fowler, UML Distilled, Addison Wesley, 2nd Edition, 2003
- Thomas T. Barker , "Writing s/w documentation - a task oriented approach", Allyn & Bacon Series of Technical Communication , 1998.
- Steve Mc Connell, Code Complete, Microsoft Press, ISBN 978-0-7356-1967-8 Second Edition (June 2004)

Lab : Software Engineering

Credit : 1

Marks : 25

List of suggested **PRACTICALS** using UML (the numbers in brackets indicate number of practicals) :

- 1) SRS using IEEE format[2]
- 2) Draw a USE Case diagram and write Use Case descriptions for the Use Cases[2]
- 3) Draw a Class Diagram[2]
- 4) Draw a Sequence Diagram[2]
- 5) Draw an Activity Diagram[2]
- 6) Draw a State Chart Diagram[2]
- 7) Draw a Gantt Chart for a project[1]
- 8) Develop a mini project/ Case Study[2]

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Syllabus for Elective Papers for

PGDCA

(2016-2017)

Paper Title: Multimedia

Marks: 75

Credits: 3

Course Prerequisites: Nil

Course Objectives:

To learn the basic Multimedia concepts and develop skills and competencies to design graphical images, Audio and Video Capture and Editing using Software tools.

Learning Outcomes:

- Understand the building blocks of Multimedia.
- Develop creativity and publish a self-contained Multimedia Application using multimedia authoring tools in various application areas.

Syllabus

I. Introduction to Multimedia: [4L]

Overview of multimedia, Multimedia building blocks, Digital representation, Interaction techniques and devices, Stages of a Multimedia Project: Planning and Costing, Designing and Producing, Testing and Delivering. The Multimedia team and their roles: Project Manager, Writer, Video specialist, Audio specialist and Multimedia programmer.

Multimedia architecture: [4L]

Introduction to multimedia architectures, User interfaces, Windows multimedia support, Windows API for Multimedia, Multimedia Database Systems, Media streaming, Multimedia authoring tools, Multimedia OS.

II. Multimedia Building Blocks:

Text: [4L]

Visual representation of text, Digital representation of text, Text file formats: TXT, DOC, RTF, PDF, ODT Conversion to and from of various text formats, Hypermedia and Hypertext.

Image: [4L]

Basic Image fundamentals, Importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera and its types, etc. various attributes of Images – size, color, depth, resolution, etc, Image data types, image file formats (BMP, JPEG, GIF, TIFF, PNG, DIB, EPS, CIF, PEX, PIC), their features and limitations, graphic file formats conversions.

Sound: [5L]

Sound and its Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sound-Sampling, Frequency, Sound Depth, Creation of Digital Audio files – recording & editing, Overview of various sound file formats on PC – WAV, VOC, AVI, MP3, MP4, Ogg, Verbose etc. Digital audio vs MIDI and MIDI File format, CD and DVD formats.

Animation: [6L]

Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software. Animation on the Web – features and limitations, creating simple animations for the Web. Animation file formats.

Video: [8L]

Analog and Digital Video, Video on PC. Introduction to graphics accelerator cards, DirectX Introduction to AV/DV and IEEE1394 cards, Video Broadcast Standards - NTSC, PAL, SECAM, HDTV. Introduction to video capturing, Media & Instrument – Videodisk, DVCAM, Camcorder.

Recording Formats like S-VHA Video, Component (YUV), Component Digital, Composite Digital, Video Hardware Resolutions.

Integrating Computers and Television like Video Overlay Systems, Digitized Video Playback, Differences between Computer and Television Video. Video Tips like shooting platforms, Lighting, Chroma Key or Blue Screen

III. Data Compression: [4L]

Types of compression: Lossy & Lossless, Symmetrical & Asymmetrical, Intraframe & Interframe, Hybrid. Study of different compression techniques for Text (Huffman coding, LZ & LZW), Image, Audio, Video (MPEG and AVI).

IV. Multimedia on the Web: [4L]

Bandwidth relationship, broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Interlaced V/s Non interlaced model, Graphics support in HTML, Image Map, Video on the Web – Streaming video, Real Video, MPEG and SMIL, Virtual Reality on the Web.

V. Assembling and Delivering a Project: [2L]

The four primary navigational structures used in multimedia like linear, hierarchical, non-linear and composite.

Text Book:

Reference Books:

1. Ralf Stainntetz, Katra Nahrstedt, "Multimedia Computing, communications and application", Pearson Education Services.
2. James E Shuman, "Multimedia In Action", Vikas Publishing House.
3. Jeffcoate Judith, "Multimedia in Practice, Technology and Applications", Prentice Hall India.
4. Buford, J.F. K, "Multimedia Systems", Pearson Education
5. Elson-Cook, "Principles of Interactive Multimedia", McGraw Hill Higher Education.
6. Andreas Holzinger, "Multimedi Basics – Volume – 1 Technology", Firewall Media (Laxmi Publications Pvt. Ltd) New Delhi

Laboratory: Multimedia

Credit : 1

Marks : 25

Multimedia Software Tools like GIMP, Audacity, Windows Movie Maker, Blender. iMovie (the numbers in brackets indicate number of practicals):

1. Image Handling: Cropping an image, adjusting image size, increasing the size of the work canvas, saving an image. [2]
2. Layers: Adding layers, dragging and pasting selections on to layers, dragging layers between files, viewing and hiding layers, Editing layers, rotating selections, scaling an object, preserving layers transparency, moving and copying layers, duplicating layers, deleting layers, merging layers, using adjustment layers. [2]
3. Channels and Masks: Channel palette, showing and hiding channels, splitting channels in to separate image, merging channels, creating a quick mask, editing masks using quick mask mode [1]
4. Painting and Editing: Brushes palette, brush shape, creating and deleting brushes, creating custom brushes, setting brush options, saving, loading and appending brushes, Options palette [2]
5. Opacity, pressure, or exposure, paint fade-out rate, making selections, using selection tools, adjusting selections, softening the edges of a selection, hiding a selection border, moving and copying selections, extending and reducing selections, pasting and deleting selections. [2]

6. Recording Sound using Sound Recorder (Capture), Sound capture through sound editing software, Sound editing, Noise correction, Effect enhancement; Voice Recognition; Importing audio and saving audio from Audio CD. Sound Quality types: CD Quality, Radio Quality, Telephone Quality. [2]
7. Video: Record video from video capture devices, webcams, screen capture or even streaming video and Video Editing. [2]
8. Mini Project/Problem Statement/Case Study (integrating the above experiments) like E-Book Design, Product Design. [2]

Paper Title : E-Learning

Marks : 75

Credits : 3

Course Prerequisites: Nil

Course Objectives:

- This course is an introduction to ICT (Information Communications Technology) in education.
- It aims at exploring the Instructional Design principles, developing and applying the various concepts of Instructional Design skills learnt wrt E-Learning and develop E-content in various application areas related to ICT and Education.

Learning Outcomes:

On Completion of this course the student will:

- Understand the working of an E-learning module
- Be aware of the various Instructional Design Principles.
- Develop own course material and upload it using an appropriate LMS
- Evaluate and Apply appropriate Assessment techniques to the e-content

Syllabus

1. INTRODUCTION TO E-LEARNING : (7L)

- 1.1 What is E-learning
- 1.2 Scope and form of E-learning.
- 1.3 Role of an E-learning project
- 1.4 Phases in an E-learning project

2. COURSE DEVELOPMENT FOR E-LEARNING: (12L)

- 2.1 Instructional Design.
- 2.2 The process of Designing Instruction.
- 2.3 Developing Materials. (Story Boarding, Content Integration, and SCORM Compliance).
- 2.4 Working with L.M.S. (Learning Management System)- Installation and use of the administrator, teacher and student interface. Course Definition, Registration and upload, tracking of results).

3. E-LEARNING AND PEDAGOGICAL APPROACHES: (12L)

- 3.1 The Behaviorist School of learning and its implications on E-learning.
- 3.2 The Cognitive School of Learning and its Implication on E-learning.
- 3.3 The Constructivist School of Learning and its implications on E-learning.
- 3.4 Blooms Taxonomy of Educational Objectives.
- 3.5 Types of Learning Objectives.
- 3.6 Content Analysis (Types- Facts, concepts, process, procedure, principles)
- 3.7 The Teaching of concepts, procedure, principles, understanding.
- 3.8 Enabling a motivated Learning Environment.

4. E-LEARNING STRATEGIES: (8L)

- 4.1 Simulation.
- 4.2 Drill.
- 4.3 Interactive Learning.
- 4.4 Problem Solving.
- 4.5 Tutorials.

5. ASSESSMENT DESIGN: (6L)

- 5.1 Rubrics for Assessment- Analytic and Holistic Rubrics.
- 5.2 Rubrics for Assessment.
- 5.3 Security and Authentication.

Text Book

Teachers Discovering Computers, Integrating Technology in the Classroom, Second Edition by Shelly Cashman Gunter, (ISBN: 0-7895-6492-0).28

Reference Books:

- (1) Smith, P. L. & Ragan, T. J. (2004). Instructional design. 3rd edition. New York: John Wiley & Sons. ISBN: 0471393533
- (2) M.D. Roblyer, Aaron H. Doering, Integrating Educational Technology into Teaching, Student Value Edition (6th Edition), Publisher: Pearson; 6 edition (February 25, 2012) ISBN-10: 013289680X, ISBN-13: 978-0132896801.

- (3) Dick, W., Carey, L., & Carey, J. O. (2009). The systematic design of instruction (7th ed.). Boston: Allyn and Bacon.
- (4) Wiggins, G. P., & McTighe, J. (2005). Understanding by design (2nd ed., p. 370). Alexandria, VA: Association for Supervision and Curriculum Development.
- (5) Christensen, C. M., Horn, M. B., & Johnson, C. W. (2008). Disrupting class: How disruptive innovation will change the way the world learns. New York: McGraw-Hill.

Laboratory: E-Learning

Credit: 01

Marks: 25

List of suggested **PRACTICALS** using any Multimedia Software (the numbers in brackets indicate number of practicals):

- (1) Installing, Creating and Running a complete course using LMS [3]
 Course Administration: Creation and using Resources and Planning Activities
 Case Study: Create a complete course and work on all the resources and activities.
 Also the various grade book options etc.
- (2) Creating Storyboards (using Movie Maker/PPT or similar FOSS) [1]
- (3) Construct a Mindmap (using Freemind or any other FOSS) [1]
- (4) Prepare a 10-minute Video tutorial on some system (e.g. how to search for free images in Google) using screen cast. Example tool that can be used: screencastomatic). [2]
- (5) Study a virtual world system like Whyville, and make a 10 slide presentation (using PPT or FOSS on it). [2]
- (6) Create a fully tagged 10-question QB on a topic and load onto Moodle. [2]
- (7) Build a course using WISE [2]
- (8) Design Rubrics (for a given scenario) [2]

Paper Title : Python Programming

Marks : 75

Course Prerequisites: Nil

Course Objectives : To provide skills of data analysis using Python programming language

Learning Outcome:

Students will learn Python programming, and apply it in data analysis & visualization.

Syllabus

Introduction to Python [3L]

Motivation, programming paradigms, What Python can do, Python's technical strength, Python interpreter, Program execution, Execution model variations, How to run programs

Basic Syntax [6L]

Variable and Data Types, Operator, Conditional Statements - if, if- else, Nested if-else. Looping – For, While, Nested loops. Control Statements – Break, Continue, Pass.

String Manipulation [5L]

Accessing Strings, Basic Operations, String slices, Function and Methods.

Lists [3L]

Introduction, Accessing list, Operations, Working with lists, Function and Methods

Tuple [4L]

Introduction, Accessing tuples, Operations, Working, Functions and Methods

Dictionaries [4L]

Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions

Functions [6L]

Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables

Modules [5L]

Importing module. Math module. Random module. Packages. Composition

Input-Output [5L]

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions

Exception Handling [4L]

Exception. Exception Handling - Except clause, Try ? finally clause. User Defined Exceptions

Text Book:

1. Mark Lutz, Learning Python, O'Reilly Media, Third Edition, 2008

Reference Books:

1. Alex Martelli, Python – A Nutshell, O'Reilly Media, Second Edition, 2006
2. Wes McKinney, Python for Data Analysis, O'Reilly Media, 2012

Laboratory: Python Programming

Credit: 01

Marks: 25

List of Experiments using Python Language

- 1) Program to compute a given formula
- 2) if else
- 3) nested if else
- 4) loop
- 5) loop
- 6) string manipulation
- 7) string manipulation
- 8) list
- 9) tuple
- 10) dictionary
- 11) function
- 12) module
- 13) Input-Output
- 14) Input-Output
- 15) exception handling

Paper Title: Human Computer Interface

Marks: 75

Credits: 3

Course Prerequisites: Nil

Course Objectives:

To study the different aspects of human computer interaction and the computer interface design concepts.

Learning Outcomes

- To understand the intricacies of human interaction with a computer System
- To understand the concept of a graphical user interface, and its design characteristics
- To recognize the human element its strengths and weakness for computer interaction
- To know the principles of good screen design and layouts
- To know the different navigation schemes on windows based interface; learn the different types of selection devices and components of a window based interface
- To know the different types of interaction devices and media

Syllabus

1. Introduction: Human-Computer Interaction, Evaluating Designs, The Birth of HCI. Importance of user Interface, Importance of good design, Benefits of good design, principles & heuristics of good design (4L)
2. Human interaction with computers, Importance of : Human characteristics, Human consideration, Human interaction speeds, Understanding business functions. User centred design- Need-finding: Participant Observation, Interviewing, Additional Need finding, contextual inquiry & persona. (6L)
3. Rapid Prototyping: story boarding. Paper Prototyping and Mockup, Video Prototyping, Creating and Comparing Alternatives (5L)
4. Direct Manipulation and Representations: various user interaction models- command, menu, Direct Manipulation. Mental Models. Heuristics (guidelines) for design. (7L)
5. Graphical Interface Design: Graphical user interface, standards such as Microsoft windows HCI guidelines, Windows: Navigation schemes selection of window; Selection of devices based and screen based controls,

- Components, Text and messages, Icons, Multimedia, Colors., controls, Help & error messages design. (8L)
6. Web user interface design – jessy James Garette five layers of user experience. (4L)
7. Heuristic Evaluation: Heuristic Evaluation — Why and How? (4L)
8. visualization, Amount of information, Focus and emphasis, Presentation information simply and meaningfully, Information retrieval on web, Statistical graphics (7L)

Text books:

1. Alan Cooper & Robert Reimann, About Face 2.0: The Essentials of Interaction Design, Wiley
2. Alan Dix, Janet Finlay, Gregory D. Abowd, and Russell Beale, Human-Computer Interaction, Pearson, 3rd Edition, 2004.
3. Ben Shneiderman and Catherine Plaisant, Designing the User Interface: Strategies for Effective Human-Computer Interaction Pearson Addison-Wesley, 5th Edition, 2009
4. Donald A. Norman, The Design of Everyday Things, Basic Books, 2002

Lab : Human Computer Interface

Credit : 1

Marks : 25

Suggested list of practical (Numbers in brackets indicate number of practicals)

1. Paper Prototyping using templates (1)
2. Conducting survey interview and summarizing the result(1)
3. Persona- conducting contextual interview and developing persona(1)
4. GUI design- form design, menu design, help, error messages(2)
5. Web UI design- pages, navigation, controls, Page submission – Asynchronous (2)
6. Report designs (2)
7. Visualization and info graphics (1)
8. Heuristic evaluation(2)
9. Story boarding (1)

Paper Title: E-Commerce
Marks: 75
Credits: 3

Course Prerequisites: Nil

Course Objectives:

This course aims to study the working of E-Commerce website and the various background processes involved. As part of the course the student will study the activities associated with e-commerce like buying, selling and payment, understand the various technologies used in e-commerce websites and security mechanisms involved in e-commerce websites.

Learning Outcomes:

On Completion of this course the student will:

- Understand the working of an E-Commerce website
- Be aware of the various E-Commerce Strategies.
- Develop own E-commerce website and operate it.
- Evaluate and Apply appropriate Payment mechanisms to the e-commerce website

1. INTRODUCTION TO ELECTRONIC COMMERCE: (3L)

- 1.1: The Scope of Electronic Commerce
- 1.2: Definition of Electronic Commerce
- 1.3: Electronic Commerce and the Trade Cycle
- 1.4: Electronic Markets
- 1.5: Electronic Data Interchange
- 1.6: Internet Commerce
- 1.7: Electronic Commerce in Perspective

2. THE VALUE CHAIN: (2L)

- 2.1: Supply Chains
- 2.2: Porter's Value Chain Model
- 2.3: Inter Organisational Value Chains

3. COMPETITIVE ADVANTAGE: (3L)

- 3.1: Competitive Advantage
- 3.2: Porter's Model

- 3.3: First Mover Advantage
- 3.4: Sustainable Competitive
- 3.5: Competitive Advantage using e-commerce

4. BUSINESS STRATEGY: (6 L)

- 4.1: Introduction to Business Strategy: Michael Porter's 5 force analysis
- 4.2: Strategic Implications of IT
- 4.3: Technology
- 4.4: Business Environment
- 4.5: Business Capability
- 4.6: Existing Business Strategy
- 4.7: Strategy Formulation and Implementation Planning
- 4.8: e-Commerce Implementation - technical and business
- 4.9: e-Commerce Evaluation
- 4.10: Auction methods

5. ELECTRONIC DATA INTERCHANGE (EDI): (3L)

- 5.1: EDI Definition
- 5.2: EDI Technology
- 5.3: EDI Standards
- 5.4: EDI Communications

6. ELECTRONIC PAYMENT SYSTEMS: (8 L)

- 6.1 Overview of the electronic payment technology; limitations of traditional payment instruments.
- 6.2 Electronic or Digital Cash-Properties of Electronic Cash, Digital Cash in action.
- 6.3 Electronic Checks-benefits of electronic checks, electronic checks in action,
NetCheck: A Prototype Electronic Check System.
- 6.4 Online Credit Card-Based Systems- types of credit card payments, Secure Electronic Transactions (SET)
- 6.5 Other Emerging Financial Instruments: POS (Point of Sale), E-Cash, Net Banking, Credit/Debit Cards and Electronic Benefits and Security Issues.
- 6.6 Case Studies of the various modes of electronic payment of various types of websites

7. E-BUSINESS: (6 L)

7.1 EDI Application in business, E- Commerce Law, Forms of Agreement, Govt. policies and Agenda.

7.2 Case Study of Internet bookshops, Grocery supplies, software supplies and support, electronic newspapers, Internet banking, Virtual auctions, online, share dealing.

7.3 Business to Legal issues: Risks involved; Paper Document vs. Electronic document, Authentication of Electronic document, Laws, Legal issues for Internet Commerce: Trademarks and Domain names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract.

8. FIREWALLS AND TRANSACTION SECURITY: (8L)

8.1: Firewalls and Network Security: Types of firewalls, Firewall Security Policies, Emerging Firewall Management Issues.

8.2: Transaction Security: Types of Online Transactions, Requirements for Transaction Security.

8.3: Encryption and Transaction Security: Secret-Key encryption, Public-Key Encryption, Implementation and Management Issues.

8.4: Digital Certificate

8.5 Security Threats to E Commerce, Virtual Organization, Business Transactions on Web, E Governance and EDI

9. CONSUMER E-COMMERCE: (3L)

Consumer trade transaction, Internet, Page on the Web, Elements of E-Commerce with VB, ASP, SQL.

10. M-COMMERCE: (3L)

Basic concept and applications, difference with E-Commerce, benefits of integration with ERPs.

BOOKS RECOMMENDED FOR MAIN READING AND REFERENCE:

- e-COMMERCE Strategy, Technologies and Applications by David Whiteley; TataMcGraw Hill
- Electronic Commerce A Manager's Guide by Ravi Kalakota and Andrew B. Whinston. Published by Pearson Education.
- E-Commerce The Cutting Edge of Business by Kamlesh K Bajaj and Debjani Nag. Second Edition; Tata McGraw Hill

Laboratory: E-COMMERCE

Credit: 01

Marks: 25

List of suggested **PRACTICALS** (the numbers in brackets indicate number of practicals):

ECOMMERCE PLATFORMS: (10)

1. **WORDPRESS:** Primarily designed for creating blogs but can be used to create online store by adding appropriate themes & plugins. Basic Programming Knowledge in PHP may be required in later stages. (<http://www.wordpress.com>)
2. **WIX:**Wix is a drag & drop website builder which can also be used to build an ecommerce website without any programming experience. (<http://www.wix.com>)
3. **SHOPIFY:** Made specially to create online stores, add products, categories & handle payments all without Any Programming knowledge required. (<http://www.shopify.com>)
4. **BLOGGER :** Similar to WordPress but a blogging service provided by google which again can be customized to create an online store. (<http://www.blogger.com>)

TOOLS USED TO FACILITATE ECOMMERCE (5)

1. **GOOGLE ANAYLITICS:** Present in most ecommerce platforms and can be integrated in almost any application, giving the owner insights of the customer base visiting the website. Can also be fine-tuned to give more detailed analysis like how many visits actually got converted into leads etc. (<https://www.google.co.in/analytics>)
2. **MAIL CHIMP:** A service to send emails to customers. Useful in marketing. (<http://www.mailchimp.com>)
3. **ZENDESK :**Zendesk is used to setup a support centre for your application users . Users can open a ticket and get their issues resolved. Useful in issue tracking and management. (<https://www.zendesk.com/>)
4. **APPOINTLET :** A Service integrated with google calendar and helps manage all appointments. Useful in applications where an appointment is required. (<https://www.appointlet.com/>)
5. **UNBOUNCE :**Used to create landing pages for an application . A good landing page sometimes defines whether a user will visit the site or turn away. (<http://www.unbounce.com/>)

Paper Title: Digital Marketing

Marks: 75

Credits: 3

Course Prerequisites: Client Side Technologies

Course Objectives:

- To Build Accessible Websites that is optimized for the Search Engines.
- To study various online Marketing Strategies.
- Analyze and research Internet to improve the quality and marketability of the Websites.

Learning Outcomes:

On completion of the course students will learn the following:

- Optimize the website for various search engines.
- Market the company/product using Search Engine and Social Media.
- Analyze the Web for improving the marketing strategy.

I. Search Engine Optimisation (SEO): [10L]

Introduction to Online Search; Function of Search Engines Google Page Rank; Introduction to Search Engine Optimisation; Building Accessible Site; Keyword Research and Optimisation; Link Building Strategies; Useful Tools for SEO; The Past, Present and Future of SEO.

II. Search Engine Marketing (SEM): [9L]

Introduction to Internet and Search Engine Marketing; Google Adwords; Adwords Account Structure; Navigating in Google Adwords; Working with Keywords; Creating Ads in Google Adwords; Creating and Managing your First Ad Campaign; Adwords Reporting and Account Performance Reports.

III. Social Media Marketing (SMM): [9L]

Introduction to the World of SMM; Why Social Media?; Getting Started with Social Media; Building Relationships via Facebook, Twitter, LinkedIn, YouTube; Handling Positive and Negative Comments; Social Media Content Base Creation.

IV. Email Marketing: [5L]

Importance of Email marketing; Email Marketing Software's; Subscriber List; Email Marketing Campaign; Newsletters; Measuring the results.

V. WEB Analytics: [9L]

Web Analytics and Intelligence Tools; Basic Metrics Demystified; Introduction to Google Analytics; Goals and Actionable Insights; Data Management; Social Media Analytics; Social Media Goals and KPI's; Tools for Social Media Analytics.

VI. Marketing Automation: [3L]

Introduction to Marketing Automation; Advantages of using Marketing Automation Software; Issues with Marketing Automation.

Text Books:

- Damian Ryan, “*Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation*”, Kogan Page Publisher, 3 edition, 2014.

Reference Books:

- **Calvin Jones and Damian Ryan, “The Best Digital Marketing Campaigns in the World:**
- Nick Smith, “*Successful SEO and Search Marketing in a Week*”, Teach Yourself Publisher, 2013.
- Lee Odden , “ *Optimize: How to Attract and Engage More Customers by Integrating SEO, Social Media, and Content Marketing*”, Wiley Publishing, 1st edition, 2012.
- Avinash Kaushik, “*Web Analytics 2.0: The Art of Online Accountability & Science of Customer Centricity (Sybex)*”, Wiley Publishing, 2nd edition 2013

Practical: Digital Marketing

Credit: 1

Marks: 25

1. Using Search Engine Optimization tools (like google & bing search console, hubspot, webceo, google page speed) (3)
2. Using Search Engine Marketing tools (like google adwords, google adwords certifications, search, display, remarketing formats, facebook marketing, linkedin advertising) (3)
3. Using Social Media Marketing tools (like hootsuite, buffer, sproutsocial, klear, twitonomy, socialmention, google alerts, mention) (2)
4. Using Email Marketing tools (like mailchimp, campaign monitor, mailgun, mandrill, phplist, amazon ses) (2)
5. Using Web Analytics tools (like google analytics, compete.com, crazyegg, facebook insights, twitter insights) (3)

Paper Title: Network Administration

Marks: 75

Credits: 3

Course Prerequisites: Nil

Course Objective:

To be able to understand the working principle of network, setting up of network, Configuring network and administration of network.

Learning outcome:

On completion of the course students will be able to

- Set up and manage networks
- Configure servers and firewall

Syllabus

1. **Introduction:** [15L]
Basics of TCP/IP, IP address (IPv4 and IPv6), Internet Architecture, peer to peer and client server networks, subnetting, supernetting , and basic Network commands.
2. **Administration:** [6L]
Managing users and Groups, adding/removing software/hard ware, display settings, folder options, setting up mail client, Device manager, Resource sharing. Basic Data recovery concepts : Disk repair tools, recovering files and directories, correcting errors reported by Scandisk
3. **Routing:** [8L]
Overview of routing, static and dynamic routing, adding and deleting static routes, routing protocols, RIP, OSPF and IGP
4. **Application Layer:** [12L]
DHCP (Dynamic host control protocol): Overview of DHCP , DHCP protocol, features of DHCP, Monitoring and troubleshooting, using DHCP in non routed and routed network. DNS (Domain Name Service): Overview of DNS protocol, DNS name space, Zone of authority and name resolutions, features of DNS server, Reverse lookup, Placement of DNS server, Installation and Configuring of DNS server and client.

WWW: Architectural overview: server side and client side technology. Mail server: Electronic mail, architecture and services, user agent, message transfer, Final delivery.

5. **VLAN:** [2L]

Introduction, basics of VLAN, uses of LANs, working principle, types of VLANs, frame processing.

6. **Firewall:** [2L]

Overview of firewall, types of firewall, working principles of firewall, filters.

Text book:

Craig Hunt, “*TCP/IP Network Administration*”, O'Reilly; 3rd edition, 2002

Reference Books:

1. Man pages of linux
2. Andrew S. Tanenbaum, Computer Networks, Prentice Hall of India, 4th Edition, 2002.

Lab: Network Administration

Credit: 1

Marks: 25

1. Managing users: creating/Deleting groups, users, setting passwords, setting permissions to groups and users, Device Manager
2. Setting up client server network (Installing server OS)
3. Configuring Telnet and ftp server.
4. Remote desktop connection
5. Router (2 practical)
6. DHCP server Configuration
7. Web server Installation
8. DNS server configuration
9. Firewall Configuring
10. Samba server
11. VLAN configuration

Paper Title : Object Oriented Programming

Marks : 75

Credits : 3

Course Prerequisites: Nil

Course Objectives:

- To teach the basic concepts and techniques which form the object oriented programming paradigm
- To introduce object oriented programming (OOP) using Java.

Learning Outcome:

- Understand the concept and underlying principles of Object-Oriented Programming.
- Understand how object-oriented concepts are incorporated into the Java programming language.
- Develop problem-solving and programming skills using the OOP concept.

Syllabus

1. Principles of OOP:

[6L]

Programming Paradigms, Basic concepts, OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

2. Introduction to Java:

[6L]

Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, java.Math class, Arrays in java.

3. Objects and Classes:

[8L]

Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, StringBuffer, File, this reference.

4. Inheritance and Polymorphism:

[9L]

Inheritance in java, super and sub class, Overriding, java.lang.Object class, Polymorphism, Dynamic binding, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, java.util package.

5. Event and GUI programming

[9L]

Design patterns – what and why? It's classification. Introduce the Observer design pattern. Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text

Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

6. Exception Handling:

[4L]

Exception handling – what and why? Try and catch block. Multiple catch blocks. Nested try, finally block, throw keyword, throws keyword. Custom Exception.

7. Introduction to the Collections Framework.

[3L]

Text Book:

Mahesh Matha, “Core Java, A Comprehensive Study “, PHI, India

Deitel & Deitel, *Java - How to Program*, Prentice Hall Publications

Reference Books:

1) Patrick Naughton, Herbert Schildt, *Java 2 – The Complete Reference*, McGraw Hill Education (India) Pvt. Ltd., 2002.

2) Patrick Naughton, *The Java Handbook*, McGraw Hill Education (India) Pvt. Ltd., 1996.

3) Balaguruswamy E, *Programming with Java – A Primer*, McGraw Hill Education (India) Pvt. Ltd., 2009.

4) Flanagan David, *Java Examples in a Nutshell*, Spd/O'Reilly Reprint, 2nd Edition.

5) Gosling J, Arnold K, & Holmes D, *The Java Programming Language*, Addison-Wesley Professional, 3rd Edition, 2008.

Lab: Object Oriented Programming

Credit: 1

Marks: 25

Programs using Java language that covers the following concepts:

- 1) Classes and instances
- 2) Working with the java.Math class
- 3) Inheritance (2 P)
- 4) Polymorphism, abstract classes and interfaces (3P)
- 5) Utilising the java.util package
- 6) Event handling and GUI
- 7) Applets
- 8) Exception handling
- 9) Collections framework

Paper Title: Software Testing

Marks: 75

Credits: 3

Course Prerequisites: Nil

Course Objectives:

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
- To learn how to plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

Learning Outcomes:

On Completion of this course the student will:

- Have an ability to understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
- Have an ability to use software testing methods and modern software testing tools for their testing projects.

Syllabus

Software testing principles - Software Testing- Need for testing, Psychology of testing, Testing economics, SDLC and Testing, Verification & Validation. Quality Assurance, Quality Control (2L)

Testing strategies and types - White box testing techniques - Statement coverage, Branch Coverage, Condition coverage, Decision/Condition coverage, Multiple condition coverage, Dataflow coverage, Automated code coverage analysis, Inspections, Walkthroughs Code Review (4L)

Black box testing techniques - Boundary value analysis, Robustness testing, Equivalence partitioning, Syntax testing, Finite state testing, Levels of testing, Unit, Integration and System Testing, Compatibility Testing, Domain Testing, Adhoc Testing, Use of Requirement, Traceability Matrix (5L)

Integration Testing Waterfall - Top-down ,Bottom up ,Big bang,Sandwich (2L)

System and Performance Testing - Types of system testing ,Functional and non-functional testing Acceptance Testing ,Setting entry and exit criteria for phases and typical product release scenarios ,Basic factors governing performance testing, Methodology for performance testing ,Tools for performance testing (4L)

Regression Testing - Purpose ,Timinng,Choice of tests ,Smoke tests ,Best practices (2L)

Internationalization and Localization testing - Preliminary concepts,Adhoc testing,Pair testing, Extreme testing, Agile testing, Exploratory testing,Defect seeding (3L)

Usability Testing - Factors in usability testing ,Aesthetics testing ,Accessibility testing ,Tools for usability testing (2L)

Testing object oriented software - Definitions and Challenge differences from testing non-OO Software,Class testing strategies Class Modality,State-based Testing,Message Sequence Specification (3L)

People and organizational issues in testing - Common people issues and myths in testing, Providing career paths in testing,Organizational structures for testing teams,Geographically distributed testing teams and success factors (5L)

Test Management and Automation- Test Planning,Test Management,Test Process,Test Reporting,Test Automation,Factors to consider in automation,Challenges in test automation,Test Metrics,Product Metrics,Process Metrics,Progress Metrics Use of metrics in ascertaining product release (5L)

Importance of documentation-, Need for Software Documentation,Different types of documentation,Understanding task orientation,Analyzing users ,Writing user scenarios ,User informational needs ,Document goals , User work motivations ,User analysis checklist (3L)

Maintenance- The Context Of Maintenance- Definitions, Economics of Maintenance, Evolution of Software Products,Maintaining systems effectively, categorizing Software products, Deployment Models, types of maintenance (3L)

Software Configuration Management – Baseline, Identification, Accounting, control, Audit, Source and Version Control (2L)

References:

1. Software Testing- Principles and Practices ,Srinivasan Desikan and Gopaldaswamy Ramesh
2. Integrated Approach to Software Engineering , Pankaj Jalote, Narosa Edition
3. Software Engineering – A Practitioners Approach, Roger Pressman

Laboratory: Software Testing

Credit: 01

Marks: 25

List of suggested **PRACTICALS** using any testing tool such as QuickTest Professional or equivalent :

1. Planning Test Cases (1)
2. Generating Test Cases/Test Suite(2)
3. Enhancing Tests (3)
4. Debugging Tests (2)
5. Running Tests (2)
6. Analyzing Results
7. Reporting Defects

Paper Title : Server Side Programming

Marks : 75

Credits : 3

Course Prerequisite : Client Side Technologies

Course Objective:

To give an understanding the web software development: how it is different, issues involved in it.

Learning Outcomes:

Students will be able to develop dynamic web pages.

Syllabus

Principles of OOP: [4L]

OOP: major principles - encapsulation, abstraction, inheritance, polymorphism.
Benefits of OOP, Applications of OOP.

Web Technologies: [3L]

Introduction to Web technology, Web pages and Browsing, Dynamic Web Pages, Java script, Dynamic web document technologies - PHP, JSP, ASP, Active web pages and Active Web technologies.

Tags, Escaping from HTML, Types: [4L]

Resources, NULL, Callbacks, Type juggling.

Variables: [4L]

Basics, Predefined variables and Scope, Constants: Syntax, Magic constants, Expressions.

Operators, Control structures, Functions, Predefined exceptions [4L]

Security: [9L]

Introduction, General considerations, Installed as CGI binary, Installed as an Apache module, File system Security, Database Security, Error Reporting, Using Register Globals, User Submitted Data, Hiding PHP

Features: [12L]

HTTP authentication with PHP, Cookies, Sessions, Handling file uploads, Connection handling, Persistent Database Connections, DTrace Dynamic Tracing

Ajax : [5L]

request object creation, forwarding the request, accepting response object and display on webpage

Reference Books

1. Steven Holzner, “PHP: The Complete Reference”, Tata Mcgraw Hill
2. Timothy Boronczyk , Martin E. Psinas, “PHP and MYSQL: Create - Modify – Reuse”, Wiley India Private Limited
3. Tim Converse, “PHP 5 and MySQL Bible”, Wiley India Private Limited
4. Meloni J.C., “Teach yourself PHP, MySQL and Apache all in one”, Pearson Education
5. Stephen J. Schrader, “AJAX”, imported edition.

Web Reference:

1. <http://in1.php.net/manual/en/index.php> for PHP v 5.5 and above

Lab : ServerSide Programming

Credit : 1

Marks : 25

Suggested list of practical (Numbers in brackets indicate number of practicals)

1. Creating dynamic web pages with PHP (3P)
2. Authentication, Cookies, Session management
3. Error handling
4. Database connectivity
5. Using framework like CodeIgniter
6. Ajax implementation
7. File uploading
8. Uploading and images to and from server

Paper Title: Data Structures

Marks: 75

Credits: 3

Course Prerequisites: Knowledge of Programming Language

Course Objectives:

To understand different methods of organizing data and efficiently implement different data structures.

Learning outcome:

On completion of the course student will learn:

- Different data structures like Stack, Queues, Linked Lists, Graphs and their applications.
- Implementation of data structures.

Syllabus

1. Introduction to data structures: [3L]

Concept, Data type, Data object, ADT, Need of Data Structure, Types of Data Structure

2. Algorithm analysis: [3L]

Algorithm – definition, characteristics, Space complexity, time complexity, Asymptotic notation (Big O)

3. Linked List: [8L]

Introduction to List, Implementation of List – static & dynamic representation, Types of Linked List, Operations on List, Applications of Linked List, polynomial manipulation, Generalized linked list – concept & representation.

4. Stacks: [8L]

Introduction, Representation-static & dynamic, Operations, Application - infix to postfix & prefix, postfix evaluation, Simulating recursion using stack.

5. Queues: [5L]

Introduction, Representation -static & dynamic, Operations, Circular queue, priority queue (with implementation), Concept of doubly ended queue.

6. Trees: [10L]

Concept & Terminologies, Binary tree, binary search tree, Representation – static & dynamic, Operations on BST – create, Insert, delete, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes, non recursive inorder traversal, Expression Tree.

7. Graph: [8L]

Concept & terminologies, Graph Representation – Adjacency matrix, adjacency list, Traversals – BFS & DFS, Application of BFS, DFS – Shortest path, Backtracking.

Text Book:

Horowitz Ellis, Sahni Sartaj, *Fundamentals of Data Structures in C*, University Press, 2nd Edition, 2008.

Reference:

1. Langsam Yedidiah, Augenstein J. Moshe, Tenenbaum M. Aaron , *Data Structures using C*, Pearson Education, Second Edition ,2009

2. Gilbeg Richard, Forouzan Behrouz, Data Structures: A Pseudocode Approach with C, Cengage Learning, Second Edition
3. Goodrich Michael, Tamassia Roberto, *Algorithm Design Foundations, Analysis and Internet Examples*. John Wiley and sons

Practical: Data Structures

Credit: 1

Marks: 25

Programs using C language that covers the following concepts:

1. Stack: Static/Dynamic stack implementation.
2. Stack: infix to postfix.
3. Stack: Evaluation of Postfix expression.
4. Queues: Static and Dynamic Queue Implementation
5. Queues: Circular queue
6. List: Singly Linked List,
7. List: Doubly Linked List
8. List: Circular Linked List
9. Linked List: Polynomial addition
10. Trees: Binary Search Tree: create, add, delete, display nodes.
11. Trees: BST traversal.
12. Graph: Representation of Graphs, Graph Traversals.
13. Graph: DFS, BFS.

Paper Title: Accounting and Financial Management

Marks: 75

Credits: 3

Course Prerequisites: Knowledge of Accounting

Course Objectives:

This course aims to produce knowledge, skills and understanding of accounting and financial management. It gives detail knowledge about the most important components of accountancy i.e. financial statements and Budgeting.

Learning outcome:

On completion of the course:

1. Student will develop the skills of accountancy and book keeping with the help of software.
2. Student will be independently able to prepare budget and business plan for the firms.

Syllabus

Financial Accounting: An Introduction [4L]

Meaning and Nature of Accounting, Accounting as language of Business and Accounting as information system. Accounting processes and final output of Accounting system. Principles of Accounting and double entry system. Recording of Transaction in Journal, Posting of transaction to Ledger and preparation of Trial Balance.

Preparation of Final Financial Statement [6L]

Preparation of Final Accounts – Profit and Loss account and Balance Sheet. Preparation of statement of changes in Financial Statements – Funds Flow Statement and Cash flow statement.

Analysis of Financial Statements [4L]

Horizontal (Trend) analysis and Vertical (Common-Size) analysis. Ratio Analysis – Liquidity ratio, Turnover ratio, Profitability ratio.

Cost Accounting: An Introduction [7L]

Meaning, nature and importance of cost Accounting system in an Organization. Elements of Cost and various cost Concept – Direct and indirect cost, Fixed and Variable costs, Sunk Cost Opportunity Cost, Out of Pocket and Imputed cost, Preparation of cost sheet. Understanding the nature of variable cost and fixed cost (total as well as per unit). Contribution, P/V ratio, Break Even Point. Assumptions of Cost-Volume - Profit Analysis and studying the relationship between Cost, Volume and Profit.

Budgeting [2L]

Meaning, Importance and Objective of budgeting in an Organization, Different types of Budgets including preparation of cash Budget, fixed and flexible budget, Zero based budgeting.

Financial Management: An Introduction [4L]

Nature, Objective and Scope, Financial decision making and type of financial decision. Role of Finance Manager in Organization. Basic axioms of Financial Management. Risk-Return framework for financial decision making.

Time Value of Money and Mathematics of Finance [4L]

Time Value of Money and Opportunity cost of Money, Present value and future value and Interest rate and discount rate Annuities and their types, Numerical related to the calculation of present values and future values.

Capital Budgeting Decisions [4L]

Nature and kinds of Capital budgeting decisions. Techniques of evaluating Capital budgeting decisions – Payback Period, Accounting rate of return, NPV, IRR and Profitability Index.

Cost of Capital and Sources of Finance [4L]

Basic valuation Model, Concept of Cost Capital – Weighted average Cost and Marginal Cost, Cost of debt and cost of Equity, Various long term sources of funds for a Organization.

Capital Structure and Dividend Decisions

[4L]

Concept of Capital Structure, Financial Leverage and Capital Structure, Determinants of Capital Structure, Dividend and its forms – cash dividend, right and bonus shares and buy-back of shares, determinants of Dividend Policy of firm.

Working Capital Management

[2L]

Basics of Working Capital management: Meaning of Gross and Networking Capital, Components of Working Capital. Risk-Return framework for Working Capital Decisions.

Main Reading

- 1 Pandey I. M., “Financial Management”, 7th Edition, 2002, Vikas Publishing Pvt Ltd.
- 2 M. Y. Khan and P.K. Jain, “Management: Accounting” 2nd Edition 1995, Tata McGraw-Hill Publishing, New Delhi
- 3 Maheshwari S.N. “Accounts” 2002, Vikas Publishing Pvt. Ltd.

Practical: Accounting and Financial Management

Credit: 1

Marks: 25

1. Journal entry (1P)
2. Book keeping using software.(2P)
3. Balance sheet (2P)
4. Balance sheet using software.(2P)
5. Numerical related to the calculation of present values and future values (2P)
6. Preparation of budget of a hypothetical firm (2P)
7. Returns on share of a hypothetical firm (2P)
8. Dividend policy of a hypothetical firm (2P)

Annexure II

**Parvatibai Chowgule College of Arts and Science
(Autonomous)
DEPARTMENT OF COMPUTER SCIENCE
COURSE STRUCTURE
Post Graduate Diploma in Computer Applications(PGDCA)**

Semester I (20 credits)

Course Code	Course Type	Course Name	Credits	Student (hrs/week)	
				L	P
DCA11	Core – I	Object Oriented Programming	4	3	1
DCA12	Core – II	DataBase Management Systems	4	3	1
DCA13	Core – III	Client Side Technologies	4	3	1
DCA14	Elective – I	Elective Course I	4	3	1
DCA15	Elective – II	Elective Course II	4	3	1

Semester II (20 credits)

Course Code	Course Type	Course Name	Credits	Student (hrs/week)	
				L	P
DCA21	Core – IV	Computer Networking	4	3	1
DCA22	Core – V	Software Engineering	4	3	1
DCA23	Elective – III	Elective Course III	4	3	1
DCA24	Elective – IV	Elective Course IV	4	3	1
DCA25	Elective – V	Elective Course V	4	3	1

L – Lectures ---> 1 Hour Duration

P – Practicals --->2 Hours Duration

List of Elective Courses

- EL1. Multimedia
- EL2. E-Learning
- EL3. Python Programming
- EL4. HCI
- EL5. E-commerce
- EL6. Digital Marketing
- EL7. Network Administration
- EL8. Software Testing
- EL9. Server Side Programming
- EL10. Data Structures
- EL11. Accounting and Financial Management
- EL12. Mobile Application Development
- EL13. Office Automation Tools

Course Title: Mobile Application Development
Course Code : DCA-EL12
Marks: 75
Credits: 3
Duration : 45 Hrs.

Prerequisite Courses :

- Client Side Technologies(DCA13)
- Object Oriented Programming(DCA11)

Course Objective:

- To learn how to develop applications for mobile devices, including smart phones and tablets.
- To learn the current mobile platforms, mobile application development environments and mobile device input methods.
- To design and build a variety of apps on a popular platform throughout the course to reinforce learning and to develop real competency.

Learning Outcome :

Upon successful completion of the course, the student will demonstrate the ability to:

- Explain mobile devices, including their capabilities and limitations.
- Review current mobile platforms and their architectures.
- Develop mobile applications on a popular mobile platform.
- Evaluate development with another mobile platform.

Syllabus :

Introduction to mobile devices

[3 Hrs]

Mobile devices vs. desktop devices, Why we Need Mobile App, Different Kinds of Mobile Apps, ARM and intel architectures, Power Management, Screen resolution, Touch interfaces, Application deployment - App Store, Google Play, Windows Store, Development environments – Android Studio, PhoneGAP, Native vs. web applications.

Review of HTML5/JS/CSS3

[2 Hrs]

Quick recap of technologies, Mobile-specific enhancements, Browser-detection, Touch interfaces, Geolocation, Screen orientation, Mobile browser “interpretations” (Chrome/IE).

Mobile OS Architectures

[3 Hrs]

Comparing and Contrasting architectures of Android, iOS and Windows, Underlying OS(Darwin vs. Linux vs. Windows), Kernel structure and native level programming, Runtime (Objective-C vs. Dalvik vs. WinRT), Approaches to power management, Security.

Android overview

[2 Hrs]

Introduction to Android.Overview of android stack, Introduction to OS layers, Android features.

Linux Kernel, Libraries, Android Runtime, Application Framework, Dalvik VM

Android Components – Introduction

[3 Hrs]

Activities, Services, Broadcast Receivers, Content Providers.

Building UI with Activities

[4 Hrs]

Activities, Views, layouts and Common UI components, Creating UI through code and XML, Activity life cycle, Intents, Communicating data among Activities.

Advanced UI

[5 Hrs]

Selection components (GridView, ListView, Spinner), Adapters, Custom Adapters, Menus, Toast, Custom Toast,Dialogs, Status bar Notifications.

Multithreading

[4 Hrs]

Using Java Mutithreading classes, AsyncTask, Handler, Post.

Intent, Intent Filters and Broadcast Receivers

[4 Hrs]

Role of filters, Intent-matching rules, Filters in your manifest, Filters in dynamic Broadcast Receivers, Creating Broadcast receiver, Receiving System Broadcast, Understanding Broadcast action, category and data, Sending Broadcast.

Data Storage

[5 Hrs]

Shared Preferences, Android File System, Internal storage, External storage. SQLite Introducing SQLite, SQLiteOpenHelper and creating a database, Opening and closing a database, Working with cursors, inserts, updates, and deletes.

Content Providers

[5 Hrs]

Accessing built in content providers, Content provider MIME types, Searching for content, Adding, changing, and removing content, Creating content provider, Working with content files.

Services

[5 Hrs]

Overview of services in Android, Implementing a Service, Service lifecycle, Inter Process Communication (AIDL Services).

Web Services and WebView - Consuming web services, Receiving HTTP Response (XML, JSON), Parsing JSON and XML, Using WebView.

Text Books :

1. Beginning Android 4 Development, Wei-Ming Lee(John Wiley & Sons)
2. Pro Android 4 ; Satya Komateneni, Dave MacLean (Apress)

Reference books:

1. Hello Android - Introducing Google's Mobile Development platform - Ed Brunette (The Pragmatic Bookshelf)
2. Android Apps with Eclipse 1st Edition, Onur Cinar(Apress)
3. Android- A Programmer'S Guide, Dimarzio, J.F.(Tata McGraw Hill)

Web References:

1. <http://developer.android.com/index.html>
2. <http://www.appinventor.org/>

Lab : Mobile Application Development

Credit: 1

Marks: 25

List of practicals

1. Getting Started with Android – Installing the Development Environment, Configuring Android Stack (1P)
2. Creating the First Android Application - Creating a Simple Android Project, Debugging Application through DDMS. setting up environment. AVD Creation, Executing Project on Android Screen. (1P)
3. Android application development - Use of GUI components to implement a simple application such as a Calculator. (1P)
4. Review the earlier application making use of the advanced UI components. (1P)
5. Implementing Data storage application - an application to make Insert , update , Delete and retrieve operation on the database. (2P)
6. Understanding content providers and permissions: Read phonebook contacts using content providers and display them suitably. (1P)
7. Optimizing your app performance with Services/Multithreading/Multiprocessing (2P)
8. Mini Project (3P)

Course Title: Office Automation Tools

Course Code : DCA-EL13

Marks: 75

Credits: 3

Duration : 45 Hrs.

Course Prerequisites : Nil

Course Objectives:

• The main objectives of this course to provides basic training of computer and its most common software use in office work..

Learning Outcome:

To become proficient in using:

- Spreadsheet Applications
- Desktop Publishing Applications

Syllabus:-

Spreadsheets: [8Hrs]

Spread Sheet & its Applications,Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data Filling.Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row.

Mathematical operations: [6Hrs]

(Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets- Labeling columns & rows, Formatting- Cell, row, column & Working with sheets – Sorting, Filtering, Validation,Consolidation, and Subtotal. Using Tools – Error checking, Spell Checks, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

LATEX: [6Hrs]

Introduction – Introduction to LATEX, and TEX, LATEX over Word-processor, Formatting and Syntax. Writing MATH formula's

Adobe InDesign [10Hrs]

Introduction to InDesign:Introducing the Workspace, Getting to Know InDesign, setting up a Document and Working with Pages

Learning all the primary Tools:Working with Frames, Importing and linking Graphics, introduction to masterpages, Importing and Editing text, Working with typography

Constructing a publication : setting up pages, using master pages, creating and adjusting layouts for newspapers, brochures etc., numbering pages.

Corel Draw: - Graphic design:-

[15Hrs]

Introduction to CorelDraw:

Introduction to Corel Draw, Features of Corel Draw Corel Draw Interface, learning about Raster and Vector Graphics

Basic Drawing Skills Selecting and Manipulating Objects, Drawing and Shaping Objects, Arranging Objects, learning about raster and vector graphics

Mastering Different ToolsUsing Text and Color, Working with Color Palette, Text Special Text Effects, align and distribute, transformation tools, Shaping etc.

Applying Special Effects Learning Blending options, Distortion, Contour Effects, Envelope effect, Transparency Power Clip

Working with ImagesWorking with images, applying special effects, editing bitmap

Saving, Exporting and printing Different Saving options, Exporting your designs into different formats for printing,Creating layouts and finalizing content for printing.

Text Books:

1. PageMaker-Complete by R. Shamms, Mortier &Rick Wallacl ,Techmedia
2. Straight to the Point – MS Office 2003 By Dinesh Maidasani, Publisher: firewall
- 3:Mastering Excel: Building Dashboards by Mark Moore

Reference Books:

1. Learning PageMaker 7 by Ramesh Bangia of Khanna Book Publishing Co Pvt Ltd
2. Master Visually Microsoft Office 2003 By Michael S. Toot, Publisher: visual
3. Mastering WORD 6 for Windows - Mansfield – BPB
4. Mastering EXCEL 4 for Windows - Townsend –BPB

Lab : Office Automation Tools

Credit : 01

Marks: 25

List of Practicals

PART-I

(6P)

1. Using formulas and functions:
To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales).
Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student).
2. Operating on the sheets:
Finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.
3. Creating a Chart:
To create a chart for comparing the monthly sales of a company in different branch offices.
4. Using the data consolidate command:
To use the data consolidate command to calculate the total amount budgeted for all departments (wages, travel and entertainment, office supplies and so on) or to calculate the average amount budgeted for – say, department office expenses.
5. Sorting Data, Filtering Data and creation of Pivot tables
6. Creating a well formatted document using LATEX.

PART-II

CorelDraw/Page Maker

(9P)

1. Introduction
2. Basic Drawing Skills
3. Using Text and Color
4. Working with Objects
5. Adding special effects
6. Creating output
7. Layout and layers
8. Styles and templates
9. Advanced Effects.

ANNEXURE IV B
Parvatibai Chowgule College of Arts and Science
(Autonomous)
DEPARTMENT OF COMPUTER SCIENCE
COURSE STRUCTURE
Post Graduate Diploma in Computer Applications(PGDCA)

Semester I (20 credits)

Course Code	Course Type	Course Name	Credits	Contact (hrs/week)	
				L	P
DCA11	Core – I	Object Oriented Programming	4	3	1
DCA12	Core – II	Data Base Management Systems	4	3	1
DCA13	Core – III	Client Side Technologies	4	3	1
DCA14	Elective – I	Elective Course I	4	3	1
DCA15	Elective – II	Elective Course II	4	3	1

Semester II (20 credits)

Course Code	Course Type	Course Name	Credits	Contact (hrs/week)	
				L	P
DCA21	Core – IV	Computer Networking	4	3	1
DCA22	Core – V	Software Engineering	4	3	1
DCA23	Elective – III	Elective Course III	4	3	1
DCA24	Elective – IV	Elective Course IV	4	3	1
DCA25	Elective – V	Elective Course V	4	3	1

L – Lectures --- > 1 Hour Duration

P – Practicals --->2 Hours Duration

List of Elective Courses

- EL1. Multimedia
- EL2. E-Learning
- EL3. Python Programming
- EL4. HCI
- EL5. E-commerce
- EL6. Digital Marketing
- EL7. Network Administration
- EL8. Software Testing
- EL9. Server Side Programming
- EL10. Data Structures
- EL11. Accounting and Financial Management
- EL12. Mobile Application Development
- EL13. Office Automation Tools

Programme Specific Outcome (PSO) for PGDCA

At the end of the programme the students will be able to:

PSO1 : Acquire problem-solving skills, especially the ability to analyze, design and implement solutions.

PSO2 : Demonstrate technical skills to be employed in a competitive Position in the IT field related sectors.

PSO3 : Start an Entrepreneurial venture.

PSO4 : Work in different fields like content development, Multimedia, Website designing, Networking , Banking industry, Academics etc.

PSO5 : Pursue the M.Sc (IT) programme of Goa University conducted at Chowgule College, Margao-Goa.

Parvatibai Chowgule College of Arts and Science (Autonomous)
Margao, Goa

Semester I & Semester II Syllabi for

PGDCA

(2019-2020)

Course Title: Object Oriented Programming

Course Code: DCA11

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To teach the basic concepts and techniques which form the object oriented programming paradigm.
- To introduce object oriented programming (OOP) using Java.

Course Outcome:

At the end of the course students should be able to:

CO1 : Apply fundamental object-oriented concepts in problem solving.

CO2: Analyze problem scenario and identify classes/objects, their properties/functionalities and associations.

CO3 : Analyze the problem scenario and model the system using UML diagrams.

CO4 : Implement the object oriented model in any object oriented language.

Syllabus

1. Principles of OOP:

[6Hrs]

Programming Paradigms, Basic concepts, OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

2. Introduction to Java:

[6Hrs]

Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, java. Math class, Arrays in java.

3. Objects and Classes:

[8Hrs]

Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference.

4. Inheritance and Polymorphism:

[9Hrs]

Inheritance in java, super and sub class, Overriding, java lang. Object class, Polymorphism, Dynamic binding, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, java util. package.

5. Event and GUI programming

[9Hrs]

Design patterns – what and why? It's classification. Introduce the Observer design pattern. Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

6. Exception Handling:

[4Hrs]

Exception handling – what and why? Try and catch block. Multiple catch blocks. Nested try, finally block, throw keyword, throws keyword. Custom Exception.

7. Introduction to the Collections Framework.

[3Hrs]

Text Book:

Mahesh Matha, “Core Java, A Comprehensive Study“, PHI, India

Deitel & Deitel, *Java - How to Program*, Prentice Hall Publications

Reference Books:

- 1) Patrick Naughton, Herbert Schildt, *Java 2 – The Complete Reference*, McGraw Hill Education (India) Pvt. Ltd., 2002.
- 2) Patrick Naughton, *The Java Handbook*, McGraw Hill Education (India) Pvt. Ltd., 1996.
- 3) Balaguruswamy E, *Programming with Java – A Primer*, McGraw Hill Education (India) Pvt. Ltd., 2009.
- 4) Flanagan David, *Java Examples in a Nutshell*, Spd/O'Reilly Reprint, 2nd Edition.
- 5) Gosling J, Arnold K, & Holmes D, *The Java Programming Language*, Addison-Wesley Professional, 3rd Edition, 2008.

Lab: Object Oriented Programming

Credit: 1

Marks: 25

Programs using Java language that covers the following concepts:

- | | |
|--|-------|
| 1) Classes and instances | (1P) |
| 2) Working with the java. Math class | (1P) |
| 3) Inheritance | (2 P) |
| 4) Polymorphism, abstract classes and interfaces | (3P) |
| 5) Utilising the java.util package | (1P) |
| 6) Event handling and GUI | (1P) |
| 7) Applets | (1P) |
| 8) Exception handling | (1P) |
| 9) Collections framework | (1P) |

Course Title: Data Base Management Systems

Course Code: DCA12

Marks: 75

Credits: 3

Duration : 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

It provides basic knowledge of a database management system. It helps to understand importance of ER diagram. It introduces SQL to query a database.

Course outcome:

At the end of the course students will be able to:

CO1 : Gain a broad understanding of database concepts and the need for the same.

CO2: Identify different entities and relationship between them.

CO4: Represent the given system diagrammatically using ER diagram.

CO5: Convert an ER diagram to a schema and effectively represent it using appropriate RDBMS.

CO6: Formulate queries in Relational Algebra, SQL to manipulate the database.

CO7: Analyze the schema to see if they fulfill Normalization criterion

Syllabus

1. Overview of database management

[7Hrs]

Data, information, database, database management system; Managing data; File systems versus a DBMS, advantages of a DBMS; Data abstraction, instances and schemas, data models; Data manipulation language, data definition language; Architecture of a DBMS; Users of a DBMS, database administrator.

2. Database design and the ER model

[10Hrs]

Design phases – conceptual design, logical design, physical design; ER model – entities, attributes, and relationships, mapping cardinalities, keys; ER diagrams – strong entities, weak entities, generalization, specialization, aggregation; Converting ER diagram to relational schemas.

3. Relational model

[9Hrs]

Relation, properties of relational model; Entities, integrity constraints, referential integrity constraints; Relational algebra – select, project, cross product, set operations, rename operation; Other relational operations – natural join, outer join.

4. SQL

[10Hrs]

Basic structure of SQL query – Create, select, where, from, rename operation; Set operations; Aggregate functions; Group by, having clauses; Nested queries; Views; Insert, delete, update.

5. Functional dependency and normalization **[6Hrs]**

Atomic domain, nested relation; Key, super key, primary key, candidate key; Functional dependency, axioms, closure of a set of attributes, closure of a set of functional dependencies; Purpose of normalization; 1NF; 2NF; 3NF; BCNF.

6. Introduction to Transactions **[3Hrs]**

Transaction concept, Transaction state, ACID properties, Concurrent Transactions, Serializability.

Text Book:

- A Silberschatz, H F Korth, S Sudarshan, *Database system concepts*, McGraw-Hill ,sixth Edition

Reference Books:

- Ramakrishan, J Gehrke, “*Database management systems*”, McGraw-Hill , 3rd edition
- R Elmasri, S B Navathe, “*Fundamentals of database Systems*”, Pearson Education , 5th Edition

Lab: Database Management Systems

Credit: 1

Marks: 25

List of Practical

1. ER diagram
2. ER diagram with specialization/generalization and aggregation.
3. Converting ER diagram to Schemas
4. Converting ER diagram with generalization/specialization, aggregation into schema
5. Studying RDBMS
 - a. Understanding Client server architecture
 - b. Creating tables
6. SQL
7. Introduction of .NET Framework, Advantages of .Net Framework, Components of .NET Framework, Data type & Operators with examples.
8. Loops, Control Statements, Operators, Data Types
9. Controls: Label, Button, Textbox, Picture Box
10. Controls: Radio button, Checkbox, Timer Control, Scroll Bars

11. Controls : List box, Combo Box, Drop downlist etc.
12. Working on Database
13. Working on Database
14. Normalization
15. Report Writing

Course Title: Client Side Technologies

Course Code: DCA13

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objective:

To develop a high degree of competence as a web designer by learning the client-side techniques.

Course Outcome:

At the end of the course students should be able to:

CO1: Use fundamental skills to develop a website. Select and apply markup languages for processing, identifying, and presenting of information in web pages. Use scripting languages and web services to transfer data and add interactive components to web pages.

CO2: Incorporate formal concepts of layout and organization to design websites that effectively communicate using visual elements.

CO3: Combine multiple web technologies to create advanced web components.

CO4: Design websites using appropriate security principles, focusing specifically on the vulnerabilities inherent in common web implementations.

CO4: Incorporate best practices in navigation, usability and written content to design websites that give users easy access to the information they seek.

CO5: Conceptualize and develop a mini project for a website with appropriate business models and web technologies.

Syllabus

1. The Internet

[8Hrs]

Computer Networks: LAN, MAN, WAN, etc., Layout (Ring, bus, star, etc.), IP address: public, private, static, dynamic, Internet protocols and services: http, https, ftp, smtp, nntp, etc, Telnet, dns, dhcp, Intranet & Extranet, Internet Infrastructure, Search Engines, Web Browser, Web server

2. Basic HTML:

[14Hrs]

Introduction, importance, Basic: HTML Tag, HEADER Tag, META Tag, TITLE Tag, BODY Tag, Text Formatting: PRE Tag, FONT Tag, entities, Image: IMG tag, image maps, Hyperlinks: Anchor tag, Lists: Unordered Lists, Ordered Lists, Definition Lists, Table tags: TABLE, TR and TD Tags, Cell Spacing and Cell Padding, Colspan and Rowspan, Frames: Frameset, FRAME Tag, NOFRAMES Tag, End user Interaction: FORM and INPUT Tag, Text Box, Radio Button, Checkbox, SELECT Tag and Pull Down Lists, TEXTAREA, Hidden, Submit and Reset, Special Tags : COLGROUP, THREAD, TBODY, TFOOT, blank, self, parent, top, IFRAME, LABEL, Attribute for <SELECT>.

3. HTML5:

[6Hrs]

The <canvas> element for 2D drawing, The <video> and <audio> elements for media playback, Support for local storage, New content-specific elements, like <article>, <footer>, <header>, <nav>, <section>, New form controls, like calendar, date, time, email, url, search.

4. CSS:

[4Hrs]

Introduction to CSS, Advantages, Types of style sheets: Inline, Internal, External, Multiple Style sheets and Cascading order, Grouping or nesting, Syntax, ID and Class, Pseudo-class, Pseudo-element, CSS units of measurement, Colors.

5. New features in CSS3:

[5Hrs]

Selectors, Box Model, Backgrounds and Borders, Image Values and Replaced Content, Text Effects, 2D/3D Transformations, Animations, Multiple Column Layout, User Interface.

6. Client side scripting:

[8Hrs]

Introduction to Javascript, HTML DOM, Core Javascript, form validations, introduction to XML, AJAX and JQuery

Text Book:

- Elisabeth Robson, Eric Freeman, “*Head First HTML with CSS & XHTML A Learner's Companion to HTML, CSS and XHTML*”, O'Reilly Media, 1st Edition, 2005.

References:

- Eric Freeman, “*Head First HTML5 Programming*”, O'Reilly Media, 1st Edition, 2011
- Jennifer Niederst, “*Web Design in a Nutshell*”, O'Reilly Media, 3rd Edition, 2006

Lab: Client Side Technologies

Credit: 1

Marks: 25

HTML:

1. Text formats. (1 P)
2. Image formats. (1 P)
3. Hyperlink and Listings (1 P)
4. Table formats (2 P)
5. Forms (1 P)

Cascading Style Sheet:

1. Internal and External style implementations (1 P)
2. Creating Dynamic pages using CSS. (2 P)

Javascript:

1. Implementing functions in javascript (alert(); confirm(); prompt()) (1 P)
2. Form Validations using Javascript (1 P)
3. Creating Dynamic pages using Javascript. (1 P)

HTML5:

1. Web site design using HTML5. (1 P)
2. Implementation of canvas. (1 P)

3. Embedding Audio and Video in a Webpage. (1 P)
4. Implementation of additional form controls. (1 P)

Semester II Syllabus

(2019-2020)

Course Title: Computer Networks

Course Code: DCA21

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To provide a strong background of network concepts.
- To create a good foundation covering the physical layer, data link layer, network layer and the transport layer.

Course Outcomes:

At the end of the course students should be able to:

CO1: Understand the working of reference model of communication to provide end to end services for the various applications.

CO2: Differentiate between various types of transmission media.

CO3: Understand different layers, protocols and their functioning.

CO4: Configure a network by assigning IP address.

CO5: Analyze the working of different protocols at Network, Transport and Application Layer.

Syllabus

1. Basics of Computer Networks [7Hrs]

Networking of Computer - Advantages and disadvantages of computer networking. Types of Networks - LAN, MAN, WAN, Wireless; Network Topology – Star, Ring, Bus, Tree, Complete, Irregular; Reference Models - The OSI reference model, the TCP/IP reference model.

Telephone System: Structure of telephone system, the local loops, trunks and multiplexing (FDM and TDM); Switching - Circuit switching, message switching, Packet Switching.

2. Transmission Media [6Hrs]

Transmission media - Magnetic media, twisted pair, co-axial cable (baseband and broadband), fiber optics principle, transmission of light through fiber, fiber cables, fiber optics network, comparison of fiber optic and copper wire. Wireless Transmission (The electromagnetic spectrum, Radio Transmission, Microwave Transmission, Infrared and Millimeter Waves, Light wave Transmission)

3. Data Communication Components [6Hrs]

Modem, Repeaters, Hubs, Bridges, Switches, Routers, Gateways. Data Link Protocols: Asynchronous, Synchronous, Character Oriented and Bit Oriented Protocols. Error Control, Internet.

4. Medium Access Control Sublayer (MAC): [8Hrs]

Multiple Access Protocols, CSMA Protocols, Collision-Free Protocols (Bit Map protocol, Binary countdown), 802.3 Frame Header, Ethernet: Ethernet Cabling, Manchester Encoding, The Ethernet MAC sublayer protocol, The Binary exponential backoff algorithm, Switched Ethernet, Fast Ethernet, Gigabit Ethernet.

5. IP Addressing [14Hrs]

IP Address class, Network and Host Addressing, Subnet, Subnet Mask. TCP/IP Protocol Suite:

Network Layer: Services, Static vs Dynamic address, Shortest Path Routing Algorithm, IP Protocol Header, Address resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP).

Transport Layer: User Datagram Protocol (UDP), UDP Header, Transmission Control Protocol (TCP), Segment Header, Connection Establishment and Release.

6. Application Layer

[4Hrs]

Telnet (Terminal Network), HTTP, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP).

Text Book:

- Behrouz A. Forouzan, “*Data Communications and Networking*”, McGraw Hill Education (India) Pvt. Ltd., 4th Edition, 2006.

Reference Books:

- Andrew S. Tanenbaum, “*Computer Networks*”, Prentice Hall of India, 4th Edition, 2002.
- James F. Kurose & Keith W. Ross, “*Computer Networking: A Top-Down Approach, Pearson India*”, 5th Edition, 2012

Lab: Computer Networks

Credit: 1

Marks: 25

- | | |
|--|-------|
| 1. Installing OS and drivers | (1 P) |
| 2. Cable colour code and crimping, Demonstration of structured cabling | (1 P) |
| 3. Setting up of network (TCP/IP configuration) | (1 P) |
| 4. Sharing resources (files, printer etc.) | (1 P) |
| 5. Study of Network Commands | (1 P) |
| 6. Setting up of wireless network (Adhoc and Infrastructure mode) | (1 P) |
| 7. Network monitoring tool | (1 P) |
| 8. Wire shark Tool | (1 P) |
| 9. Network simulator tool1 | (2 P) |
| 10. Network simulator tool2 | (1 P) |
| 11. Simulation of Network Protocols using programming language | (2 P) |
| 12. Simple client-server socket program. | (2 P) |

Course Title: Software Engineering

Course Code: DCA22

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

On completion of the course the students will develop specific skills and competencies to use various software engineering tools and methods to develop software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications.

Course Outcomes:

At the end of the course students should be able to:

CO1: Understand testing of web applications and automated testing tools.

CO2: Apply modern software testing processes in relation to software development and project management.

CO3: Create test strategies and plans, design test cases, prioritize and execute them.

CO4: Develop an ability to understand and identify various software testing problems and solve them.

Syllabus

Software process:

[5Hrs]

Characteristics of software process.

Software Development Processes and Methodologies: waterfall, prototyping, iterative, spiral, unified process.

Benefits of iterative and incremental approach with emphasis on Unified process, CASE Tools, Agile methodologies.

Project Management: [7Hrs]

Planning a Software Project – Cost estimation, Project Scheduling, Software configuration management plans, Quality Assurance plans, Project Monitoring plans and Risk Management. Techniques such as Interviewing, Requirement Workshop, brainstorming, prototyping. Characteristics of SRS

OOAD and UML: [10Hrs]

OOAD: Definition; object oriented analysis; object oriented design and modeling; Assigning responsibilities.

UML: Main UML diagrams – Class diagram, sequence diagram, activity diagram, use case diagram. Use case model – use case diagram, use case descriptions, use case realization using sequence and activity diagrams. Supplementary requirements. Advanced use case model features.

Requirements: Functional and non-functional:

System Design: Class diagram, sequence diagram, activity diagram, state chart diagram, deployment diagram. Brief introduction to other UML diagrams.

Software Architecture Patterns: [5Hrs]

Major Architectural Styles (patterns) like Layered Architecture, Pipe and Filter, Shared (Central) Data Store, Event Driven, Model-View-Controller (MVC), “Distributed & Emerging” Service Oriented Architecture (SOA) and Elementary GRASP Patterns.

Human Computer Interaction: [4Hrs]

HCI Definition; User categories, Interface Design-Internal & External Interface design, user interface design, Interface design guidelines.

Coding: [2Hrs]

Coding styles, standards, peer reviews, checklist.

Testing: [4Hrs]

Testing Fundamental, Functional Testing, Structural Testing, Testing Object-Oriented Programs, Testing Process and Metrics.

Documentation and Maintenance: [4Hrs]

Need for Software Documentation. Types of documentation.

Need for Maintenance, Types of Maintenance.

Reengineering: [4Hrs]

Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering, The Economics of Reengineering

Text Books:

- Roger Pressman, Software Engineering: A Practitioners Approach, McGraw Hill, (6th Edition), 1997.
- Craig Larman, Applying UML and patterns, Addison Wesley, 2nd Edition, 2003

References:

- Pankaj Jalote, an Integrated Approach to Software Engineering, Narosa Publishing House, 2nd Edition.
- GlenfordJ.Myers, "The Art of Software Testing ", John Wiley & Sons, 1979.
- Sommerville, Software Engineering, Addison Wesley, 7th edition, 1996.
- Martin Fowler, UML Distilled, Addison Wesley, 2nd Edition, 2003
- Thomas T. Barker, "Writing s/w documentation - a task oriented approach", Allyn & Bacon Series of Technical Communication, 1998.
- Steve Mc Connell, Code Complete, Microsoft Press, ISBN 978-0-7356-1967-8 Second Edition (June 2004).

Lab: Software Engineering

Credit: 1

Marks: 25

List of suggested practical's using UML (the numbers in brackets indicate number of practical's):

- 1) SRS using IEEE format [2P]
- 2) Draw a USE Case diagram and write Use Case descriptions for the Use Cases[2P]
- 3) Draw a Class Diagram [2P]
- 4) Draw a Sequence Diagram [2P]
- 5) Draw an Activity Diagram [2P]
- 6) Draw a State Chart Diagram [2P]
- 7) Draw a Gantt Chart for a project [1P]
- 8) Develop a mini project/ Case Study [2P]

Syllabus for Elective Courses for

PGDCA

(2019-2020)

Course Title: Multimedia

Course Code: DCA-EL1

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

To learn the basic Multimedia concepts and develop skills and competencies to design graphical images, Audio and Video Capture and Editing using Software tools.

Course Outcomes:

At the end of the course students will be able to:

CO1 : Understand the concept of Multimedia – Team members and their roles.

CO2: Identify and describe the function of the general skill sets in the multimedia industry.

CO3 : Classify and realize the types of Authoring tools and their functions.

CO4 : Identify basic components of a multimedia project.

CO5 : Analyze the requirements of Multimedia product.

CO6: Assemble and deliver multimedia projects.

Syllabus

I. Introduction to Multimedia: [4Hrs]

Overview of multimedia, Multimedia building blocks, Digital representation, Interaction techniques and devices, Stages of a Multimedia Project: Planning and Costing, Designing and Producing, Testing and Delivering. The Multimedia team and their roles: Project Manager, Writer, Video specialist, Audio specialist and Multimedia programmer.

Multimedia architecture: [4Hrs]

Introduction to multimedia architectures, User interfaces, Windows multimedia support, Windows API for Multimedia, Multimedia Database Systems, Media streaming, Multimedia authoring tools, Multimedia OS.

II. Multimedia Building Blocks: [4Hrs]

Text:

Visual representation of text, Digital representation of text, Text file formats: TXT, DOC, RTF, PDF, ODT Conversion to and from of various text formats, Hypermedia and Hypertext.

Image: [4Hrs]

Basic Image fundamentals, Importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera and its types, etc. various attributes of Images – size, color, depth, resolution, etc, Image data types, image file formats (BMP, JPEG, GIF, TIFF, PNG, DIB, EPS, CIF, PEX, PIC), their features and limitations, graphic file formats conversions.

Sound: [5Hrs]

Sound and its Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sound-Sampling, Frequency, Sound Depth, Creation of Digital Audio files – recording & editing. Overview of various sound file formats on PC – WAV, VOC, AVI, MP3, MP4, Ogg, Verbose etc. Digital audio vs MIDI and MIDI File format, CD and DVD formats.

Animation: [6Hrs]

Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software. Animation on the Web – features and limitations, creating simple animations for the Web. Animation file formats.

Video: [8Hrs]

Analog and Digital Video, Video on PC. Introduction to graphics accelerator cards, DirectX Introduction to AV/DV and IEEE1394 cards, Video Broadcast Standards - NTSC, PAL, SECAM, HDTV. Introduction to video capturing, Media & Instrument – Videodisk, DVCAM, Camcorder.

Recording Formats like S-VHA Video, Component (YUV), Component Digital, Composite Digital, and Video Hardware Resolutions.

Integrating Computers and Television like Video Overlay Systems, Digitized Video Playback, Differences between Computer and Television Video. Video Tips like shooting platforms, Lighting, Chroma Key or Blue Screen

III. Data Compression: [4Hrs]

Types of compression: Lossy & Lossless, Symmetrical & Asymmetrical, Intraframe & Interframe, Hybrid. Study of different compression techniques for Text (Huffman coding, LZ & LZW), Image, Audio, Video (MPEG and AVI).

IV. Multimedia on the Web: [4Hrs]

Bandwidth relationship, broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Interlaced V/s Non interlaced model, Graphics support in HTML, Image Map, Video on the Web – Streaming video, Real Video, MPEG and SMIL, Virtual Reality on the Web.

V. Assembling and Delivering a Project: [2Hrs]

The four primary navigational structures used in multimedia like linear, hierarchical, non-linear and composite.

Text Book:

Vaughan Tay, “Multimedia: Making it Work”, 8th edition, Tata McGraw-Hill

Reference Books:

1. Ralf Stainntetz, KatraNahrstedt, “Multimedia Computing, communications and application”, Pearson Education Services.
2. James E Shuman, “Multimedia In Action”, Vikas Publishing House.
3. Jeffcoate Judith, “Multimedia in Practice, Technology and Applications”, Prentice Hall India.
4. Buford, J.F. K, “Multimedia Systems”, Pearson Education
5. Elson-Cook, “Principles of Interactive Multimedia”, McGraw Hill Higher Education.
6. Andreas Holzinger, “Multimedi Basics – Volume – 1 Technology”, Firewall Media

Lab: Multimedia

Credit : 1

Marks: 25

Multimedia Software Tools like GIMP, Audacity, Windows Movie Maker, Blender, iMovie (the numbers in brackets indicate number of practical's):

1. Image Handling: Cropping an image, adjusting image size, increasing the size of the work canvas, saving an image. **[2P]**
2. Layers: Adding layers, dragging and pasting selections on to layers, dragging layers between files, viewing and hiding layers, Editing layers, rotating selections, scaling an object, preserving layers transparency, moving and copying layers, duplicating layers, deleting layers, merging layers, using adjustment layers. **[2P]**
3. Channels and Masks: Channel palette, showing and hiding channels, splitting channels in to separate image, merging channels, creating a quick mask, editing masks using quick mask mode. **[1P]**
4. Painting and Editing: Brushes palette, brush shape, creating and deleting brushes, creating custom brushes, setting brush options, saving, loading and appending brushes, Options palette. **[2P]**
5. Opacity, pressure, or exposure, paint fade-out rate, making selections, using selection tools, adjusting selections, softening the edges of a selection, hiding a selection border, moving and copying selections, extending and reducing selections, pasting and deleting selections. **[2P]**
6. Recording Sound using Sound Recorder (Capture), Sound capture through sound editing software, Sound editing, Noise correction, Effect enhancement ; Voice Recognition; Importing audio and saving audio from Audio CD. Sound Quality types: CD Quality, Radio Quality, Telephone Quality. **[2P]**
7. Video: Record video from video capture devices, webcams, screen capture or even streaming video and Video Editing. **[2P]**
8. Mini Project/Problem Statement/Case Study (integrating the above experiments) like E-Book Design, Product Design. **[2P]**

Course Title: E-Learning

Course Code: DCA-EL2

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- This course is an introduction to ICT (Information Communications Technology) in education.
- It aims at exploring the Instructional Design principles, developing and applying the various concepts of Instructional Design skills learnt wrt E-Learning and develop E-content in various application areas related to ICT and Education.

Course Outcomes:

At the end of the course students will be able to :

CO1 : Develop instructional design skills with E- learning project.

CO2 : Design and develop quality E-content.

CO3 : Create, build and upload course material using an appropriate LMS.

CO4 : Recommend the use of appropriate E-learning strategies to an E-learning course.

CO5 : Apply and evaluate appropriate assessment Rubrics to the E-content.

Syllabus

1. INTRODUCTION TO E-LEARNING:

[7Hrs]

1.1 What is E-learning

1.2 Scope and form of E-learning.

1.3 Role of an E-learning project

1.4 Phases in an E-learning project

2. COURSE DEVELOPMENT FOR E-LEARNING:

[12Hrs]

- 2.1 Instructional Design.
- 2.2 The process of Designing Instruction.
- 2.3 Developing Materials. (Story Boarding, Content Integration, and SCORM Compliance).
- 2.4 Working with L.M.S. (Learning Management System) - Installation and use of the administrator, teacher and student interface. Course Definition, Registration and upload, tracking of results).

3. E-LEARNING AND PEDAGOGICAL APPROACHES: [12Hrs]

- 3.1 The Behaviorist School of learning and its implications on E-learning.
- 3.2 The Cognitive School of Learning and its Implication on E-learning.
- 3.3 The Constructivist School of Learning and its implications on E-learning.
- 3.4 Blooms Taxonomy of Educational Objectives.
- 3.5 Types of Learning Objectives.
- 3.6 Content Analysis (Types- Facts, concepts, process, procedure, principles)
- 3.7 The Teaching of concepts, procedure, principles, understanding.
- 3.8 Enabling a motivated Learning Environment.

4. E-LEARNING STRATEGIES: [8 Hrs]

- 4.1 Simulation.
- 4.2 Drill.
- 4.3 Interactive Learning.
- 4.4 Problem Solving.
- 4.5 Tutorials.

5. ASSESSMENT DESIGN: [6Hrs]

- 5.1 Rubrics for Assessment- Analytic and Holistic Rubrics.
- 5.2 Rubrics for Assessment.
- 5.3 Security and Authentication.

Text Book

Teachers Discovering Computers, Integrating Technology in the Classroom, Second Edition by Shelly Cashman Gunter, (ISBN: 0-7895-6492-0).28

Reference Books:

- 1. Smith, P. L. & Ragan, T. J. (2004). Instructional design.3rd edition. New York: John Wiley & Sons. ISBN: 0471393533.

2. M.D. Roblyer, Aaron H. Doering, Integrating Educational Technology into Teaching, Student Value Edition (6th Edition), Publisher: Pearson; 6 edition (February 25, 2012) ISBN-10: 013289680X, ISBN-13: 978-0132896801.
3. Dick, W., Carey, L., & Carey, J. O. (2009). The systematic design of instruction (7th ed.). Boston: Allyn and Bacon.
4. Wiggins, G. P., &McTighe, J. (2005). Understanding by design (2nd ed., p. 370). Alexandria, VA: Association for Supervision and Curriculum Development.
5. Christensen, C. M., Horn, M. B., & Johnson, C. W. (2008). Disrupting class: How disruptive innovation will change the way the world learns. New York: McGraw-Hill.

Lab: E-Learning

Credit: 01

Marks: 25

List of suggested practical's using any Multimedia Software (the numbers in brackets indicate number of practicals):

- (1) Installing, Creating and Running a complete course using LMS [3P]
Course Administration: Creation and using Resources and Planning Activities
Case Study: Create a complete course and work on all the resources and activities. Also the various grade book options etc.
- (2) Creating Storyboards (using Movie Maker/PPT or similar FOSS) [1P]
- (3) Construct a Mindmap (using Freemind or any other FOSS) [1P]
- (4) Prepare a 10-minute Video tutorial on some system (e.g. how to search for free images in Google) using screen cast. Example tool that can be used: screencast-o-matic). [2P]
- (5) Study a virtual world system like Whyville, and make a 10 slide presentation (using PPT or FOSS on it). [2P]
- (6) Create a fully tagged 10-question QB on a topic and load onto Moodle. [2P]
- (7) Build a course using WISE [2P]
- (8) Design Rubrics (for a given scenario) [2P]

Course Title: Python Programming

Course Code: DCA-EL3

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

To provides skills of data analysis using Python programming language.

Course Outcome:

At the end of the course students should be able to do:

CO1: Students will learn Python programming, and apply it in data analysis and visualization.

Syllabus

Introduction to Python **[3Hrs]**

Motivation, programming paradigms, What Python can do, Python's technical strength, Python interpreter, Program execution, Execution model variations, How to run programs.

Basic Syntax **[6Hrs]**

Variable and Data Types, Operator, Conditional Statements - if, if- else, Nested if-else. Looping – For, While, Nested loops. Control Statements – Break, Continue, Pass.

String Manipulation **[5Hrs]**

Accessing Strings, Basic Operations, String slices, Function and Methods.

Lists **[3Hrs]**

Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Tuple **[4Hrs]**

Introduction, Accessing tuples, Operations, Working, Functions and Methods.

Dictionaries **[4Hrs]**

Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions.

Functions [6Hrs]

Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

Modules [5Hrs]

Importing module.Math module.Random module.Packages. Composition.

Input-Output [5Hrs]

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

Exception Handling [4Hrs]

Exception. Exception Handling - Except clause, Try ?finally clause. User Defined Exceptions

Text Book:

1. Mark Lutz, Learning Python, O'Reilly Media, Third Edition, 2008

Reference Books:

1. Alex Martelli, Python – A Nutshell, O'Reilly Media, Second Edition, 2006
2. Wes McKinney, Python for Data Analysis, O'Reilly Media, 2012

Lab: Python Programming

Credit: 01

Marks: 25

List of Experiments using Python Language:

- 1) Program to compute a given formula
- 2) if else
- 3) nested if else

- 4) loop
- 5) loop
- 6) string manipulation
- 7) string manipulation
- 8) list
- 9) tuple
- 10) dictionary
- 11) function
- 12) module
- 13) Input-Output
- 14) Input-Output
- 15) exception handling

Course Title: Human Computer Interface

Course Code: DCA-EL4

Marks: 75

Credits: 3

Prerequisite Courses: Nil

Course Objectives:

To study the different aspects of human computer interaction and the computer interface design concepts.

Course Outcomes:

At the end of the course students will be able to :

CO1 : Understand the intricacies of human interaction with a computer System.

CO2 : Understand the principles of good screen design and layouts.

CO3 : Understand the different navigation schemes on windows based interface; learn the different types of selection devices and components of a window based interface.

CO4 : Analyze Requirements of system.

CO5 : Classify human users based on their abilities, personalities.

CO6: Designing prototypes. Evaluate the design of user interfaces. Compare the interfaces different products.

Syllabus

1. Introduction: Human-Computer Interaction, Evaluating Designs, The Birth of HCI. Importance of user Interface, Importance of good design, Benefits of good design, principles & heuristics of good design. **[4Hrs]**
2. Human interaction with computers, Importance of : Human characteristics, Human consideration, Human interaction speeds, Understanding business functions. User centred design- Need-finding: Participant Observation, Interviewing, Additional Need finding, contextual inquiry & persona. **[6Hrs]**
3. Rapid Prototyping: story boarding. Paper Prototyping and Mockup, Video Prototyping, Creating and Comparing Alternatives. **[5Hrs]**
4. Direct Manipulation and Representations: various user interaction models- command, menu, Direct Manipulation. Mental Models. Heuristics (guidelines) for design. **[7Hrs]**
5. Graphical Interface Design: Graphical user interface, standards such as Microsoft windows HCI guidelines, Windows: Navigation schemes selection of window; Selection of devices based and screen based controls, Components, Text and messages, Icons, Multimedia, Colors., controls, Help & error messages design. **[8Hrs]**

6. Web user interface design – jessy James Garette five layers of user experience. [5Hrs]
7. Heuristic Evaluation: Heuristic Evaluation — Why and How? [4Hrs]
8. Visualization, Amount of information, Focus and emphasis, Presentation information simply and meaningfully, Information retrieval on web, Statistical graphics [7Hrs]

Text books:

1. Alan Cooper & Robert Reimann, About Face 2.0: The Essentials of Interaction Design, Wiley
2. Alan Dix, Janet Finlay, Gregory D. Abowd, and Russell Beale, Human-Computer Interaction, Pearson, 3rd Edition, 2004.
3. Ben Shneiderman and Catherine Plaisant, Designing the User Interface: Strategies for Effective Human-Computer Interaction Pearson Addison-Wesley, 5th Edition, 2009
4. Donald A. Norman, The Design of Everyday Things, Basic Books, 2002

Lab: Human Computer Interface

Credit: 1

Marks: 25

Suggested list of practical (Numbers in brackets indicate number of practical's)

1. Paper Prototyping using templates (1P)
2. Conducting survey interview and summarizing the result (1P)
3. Persona- conducting contextual interview and developing persona (1P)
4. GUI design- form design, menu design, help, error messages (2P)
5. Web UI design- pages, navigation, controls, Page submission – Asynchronous (2P)
6. Report designs (2P)
7. Visualization and info graphics (1P)
8. Heuristic evaluation (2P)
9. Story boarding (1P)

Course Title: E-Commerce

Course Code: DCA-EL5

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

This course aims to study the working of E-Commerce website and the various background processes involved. As part of the course the student will study the activities associated with e-commerce like buying, selling and payment, understand the various technologies used in e-commerce websites and security mechanisms involved in e-commerce websites.

Course Outcomes:

At the end of the course students will be able to :

CO1 : Understand various E-Commerce Strategies.

CO2 : Understand the Working of an E-Commerce Website.

CO3 : Evaluate the various Payment Mechanisms.

CO4 : Develop an E-Commerce Website.

1. INTRODUCTION TO ELECTRONIC COMMERCE: [3Hrs]

1.1: The Scope of Electronic Commerce

1.2: Definition of Electronic Commerce

1.3: Electronic Commerce and the Trade Cycle

1.4: Electronic Markets

1.5: Electronic Data Interchange

1.6: Internet Commerce

1.7: Electronic Commerce in Perspective

2. THE VALUE CHAIN: [2Hrs]

2.1: Supply Chains

2.2: Porter's Value Chain Model

2.3: Inter Organisational Value Chains

3. COMPETITIVE ADVANTAGE:

[3Hrs]

3.1: Competitive Advantage

3.2: Porter's Model

3.3: First Mover Advantage

3.4: Sustainable Competitive

3.5: Competitive Advantage using e-commerce

4. BUSINESS STRATEGY:

[6Hrs]

4.1: Introduction to Business Strategy: Michael Porter's 5 force analysis

4.2: Strategic Implications of IT

4.3: Technology

4.4: Business Environment

4.5: Business Capability

4.6: Existing Business Strategy

4.7: Strategy Formulation and Implementation Planning

4.8: e-Commerce Implementation - technical and business

4.9: e-Commerce Evaluation

4.10: Auction methods

5. ELECTRONIC DATA INTERCHANGE (EDI):

[3Hrs]

5.1: EDI Definition

5.2: EDI Technology

5.3: EDI Standards

5.4: EDI Communications

6. ELECTRONIC PAYMENT SYSTEMS:

[8Hrs]

6.1 Overview of the electronic payment technology; limitations of traditional payment instruments.

6.2 Electronic or Digital Cash-Properties of Electronic Cash, Digital Cash in action.

6.3 Electronic Checks-benefits of electronic checks, electronic checks in action, NetCheck: A Prototype Electronic Check System.

6.4 Online Credit Card-Based Systems- types of credit card payments, Secure Electronic Transactions (SET).

6.5 Other Emerging Financial Instruments: POS (Point of Sale), E-Cash, Net Banking, Credit/Debit Cards and Electronic Benefits and Security Issues.

6.6 Case Studies of the various modes of electronic payment of various types of websites.

7. E-BUSINESS: **[6Hrs]**

7.1 EDI Application in business, E- Commerce Law, Forms of Agreement, Govt policies and Agenda.

7.2 Case Study of Internet bookshops, Grocery supplies, software supplies and support, electronic newspapers, Internet banking, Virtual auctions, online, share dealing.

7.3 Business to Legal issues: Risks involved; Paper Document vs. Electronic document, Authentication of Electronic document, Laws, Legal issues for Internet Commerce: Trademarks and Domain names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract.

8. FIREWALLS AND TRANSACTION SECURITY: **[8Hrs]**

8.1 Firewalls and Network Security: Types of firewalls, Firewall Security Policies, Emerging Firewall Management Issues.

8.2 Transaction Security: Types of Online Transactions, Requirements for Transaction Security.

8.3 Encryption and Transaction Security: Secret-Key encryption, Public-Key Encryption, Implementation and Management Issues.

8.4 Digital Certificate.

8.5 Security Threats to E Commerce, Virtual Organization, Business Transactions on Web, E Governance and EDI.

9. CONSUMER E-COMMERCE: **[3Hrs]**

Consumer trade transaction, Internet, Page on the Web, Elements of E-Commerce with VB, ASP, SQL.

10. M-COMMERCE: **[3Hrs]**

Basic concept and applications, difference with E-Commerce, benefits of integration with ERPs.

BOOKS RECOMMENDED FOR MAIN READING AND REFERENCE:

- e-COMMERCE Strategy, Technologies and Applications by David Whiteley; TataMcGraw Hill.
- Electronic Commerce A Manager's Guide by Ravi Kalakota and Andrew B. Whinston. Published by Pearson Education.
- E-Commerce The Cutting Edge of Business by Kamlesh K Bajaj and Debjani Nag. Second Edition; Tata McGraw Hill.

Lab: E-COMMERCE

Credit: 01

Marks: 25

List of suggested practical's (the numbers in brackets indicate number of practical's):

ECOMMERCE PLATFORMS: (10P)

1. **WORDPRESS:** Primarily designed for creating blogs but can be used to create online store by adding appropriate themes & plugins. Basic Programming Knowledge in PHP may be required in later stages. (<http://www.wordpress.com>).
2. **WIX:** Wix is a drag & drop website builder which can also be used to build an ecommerce website without any programming experience. (<http://www.wix.com>).
3. **SHOPIFY:** Made specially to create online stores, add products, categories & handle payments all without Any Programming knowledge required. (<http://www.shopify.com>).
4. **BLOGGER :** Similar to Word Press but a blogging service provided by google which again can be customized to create an online store. (<http://www.blogger.com>).

TOOLS USED TO FACILITATE ECOMMERCE (5P)

1. **GOOGLE ANAYLTICS:** Present in most ecommerce platforms and can be integrated in almost any application, giving the owner insights of the customer base visiting the website. Can also be fine-tuned to give more detailed analysis like how many visits actually got converted into leads etc. (<https://www.google.co.in/analytics>).
2. **MAIL CHIMP:** A service to send emails to customers. Useful in marketing. (<http://www.mailchimp.com>).
3. **ZENDESK :**Zendesk is used to setup a support centre for your application users . Users can open a ticket and get their issues resolved. Useful in issue tracking and management. (<https://www.zendesk.com/>).

4. **APPOINTLET** : A Service integrated with google calendar and helps manage all appointments. Useful in applications where an appointment is required. (<https://www.appointlet.com/>).
5. **UNBOUNCE** :Used to create landing pages for an application . A good landing page sometimes defines whether a user will visit the site or turn away. (<http://www.unbounce.com/>).

Course Title: Digital Marketing

Course Code: DCA-EL6

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Client Side Technologies (DCA13)

Course Objectives:

- To Build Accessible Websites that is optimized for the Search Engines.
- To study various online Marketing Strategies.
- Analyze and research Internet to improve the quality and marketability of the Websites.

Course Outcomes:

At the end of the course students will be able to:

CO1: Optimize the website for various search engines.

CO2: Market the company/product using Search Engine and Social Media.

CO3: Analyze the Web for improving the marketing strategy.

I. Search Engine Optimisation (SEO):

[10Hrs]

Introduction to Online Search; Function of Search Engines Google Page Rank; Introduction to Search Engine Optimisation; Building Accessible Site; Keyword Research and Optimisation; Link Building Strategies; Useful Tools for SEO; The Past, Present and Future of SEO.

II. Search Engine Marketing (SEM): [9Hrs]

Introduction to Internet and Search Engine Marketing; Google Adwords; Adwords Account Structure; Navigating in Google Adwords; Working with Keywords; Creating Ads in Google Adwords; Creating and Managing your First Ad Campaign; Adwords Reporting and Account Performance Reports.

III. Social Media Marketing (SMM): [9Hrs]

Introduction to the World of SMM; Why Social Media?; Getting Started with Social Media; Building Relationships via Facebook, Twitter, LinkedIn, YouTube; Handling Positive and Negative Comments; Social Media Content Base Creation.

IV. Email Marketing: [5Hrs]

Importance of Email marketing; Email Marketing Software's; Subscriber List; Email Marketing Campaign; Newsletters; Measuring the results.

V. WEB Analytics: [9Hrs]

Web Analytics and Intelligence Tools; Basic Metrics Demystified; Introduction to Google Analytics; Goals and Actionable Insights; Data Management; Social Media Analytics; Social Media Goals and KPI's; Tools for Social Media Analytics.

VI. Marketing Automation: [3Hrs]

Introduction to Marketing Automation. Advantages of using Marketing Automation Software, Issues with Marketing Automation.

Text Books:

- Damian Ryan, *“Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation”*, Kogan Page Publisher, 3 edition, 2014.

Reference Books:

- **Calvin Jones and Damian Ryan, “The Best Digital Marketing Campaigns in the World:**
- Nick Smith, “*Successful SEO and Search Marketing in a Week*”, Teach Yourself Publisher, 2013.
- Lee Odden ,“ *Optimize: How to Attract and Engage More Customers by Integrating SEO, Social Media, and Content Marketing*”, Wiley Publishing, 1st edition, 2012.
- AvinashKaushik, “*Web Analytics 2.0: The Art of Online Accountability & Science of Customer Centricity (Sybex)*”, Wiley Publishing, 2nd edition 2013.

Lab: Digital Marketing

Credit: 1

Marks: 25

1. Using Search Engine Optimization tools (like google & bing search console, hubspot, webceo, google page speed). (3P)
2. Using Search Engine Marketing tools (like google adwords, google adwords certifications, search, display, remarketing formats, facebook marketing, linked in advertising). (3P)
3. Using Social Media Marketing tools (like hootsuite, buffer, sproutsocial, klear, twitonomy, socialmention, google alerts, mention). (2P)
4. Using Email Marketing tools (like mailchimp, campaign monitor, mailgun, mandrill, phplist, amazon ses. (2P)
5. Using Web Analytics tools (like google analytics, compete.com, crazyegg, facebook insights, twitter insights). (3P)

Course Title: Network Administration

Course Code: DCA-EL7

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objective:

To be able to understand the working principle of network, setting up of network, Configuring network and administration of network.

Course outcome:

At the end of the course students will be able to :

CO1.Understand the basic working of reference model of communication to provide end to end services for the various applications

CO2.Analyse the various behaviour of network protocols using the networking tools.

CO3. Understand the basics of IP.

CO4.Design the basic computer network and maintain the network

CO5: Create and manage users and groups.

CO7: Configure routers and basic network application

Syllabus

1. Introduction: [15Hrs]

Basics of TCP/IP, IP address (IPv4 and IPv6), Internet Architecture, peer to peer and client server networks, subnetting, supernetting , and basic Network commands.

2. Administration: [6Hrs]

Managing users and Groups, adding/removing software/hard ware, display settings, folder options, setting up mail client, Device manager, Resource sharing. Basic Data recovery concepts: Disk repair tools, recovering files and directories, correcting errors reported by Scandisk.

3. Routing: [8Hrs]

Overview of routing, static and dynamic routing, adding and deleting static routes, routing protocols, RIP, OSPF and IGP.

4. Application Layer: [12Hrs]

DHCP (Dynamic host control protocol): Overview of DHCP , DHCP protocol, features of DHCP, Monitoring and troubleshooting, using DHCP in non routed and routed network. DNS (Domain Name Service): Overview of DNS protocol, DNS name space, Zone of authority and name resolutions, features of DNS server, Reverse lookup, Placement of DNS server, Installation and Configuring of DNS server and client. WWW: Architectural overview: server side and client side technology. Mail server: Electronic mail, architecture and services, user agent, message transfer, Final delivery

5. **VLAN:** [2Hrs]

Introduction, basics of VLAN, uses of LANs, working principle, types of VLANs, frame processing.

6. **Firewall:** [2Hrs]

Overview of firewall, types of firewall, working principles of firewall, filters.

Text book:

Craig Hunt, "*TCP/IP Network Administration*", O'Reilly; 3rd edition, 2002

Reference Books:

1. Man pages of linux
2. Andrew S. Tanenbaum, Computer Networks, Prentice Hall of India, 4th Edition, 2002.

Lab: Network Administration

Credit: 1

Marks: 25

A Mini Project [incorporate at least 6 below features] / [ANY 6 practical's]

1. Managing users: creating/Deleting groups, users, setting passwords, setting permissions to groups and users, Device Manager[2p]
2. Setting up client server network[2P]
3. Configuring Telnet and ftp server
4. Remote desktop connection
5. Router configuration.
6. DHCP Server Configuration
7. Web Server Installation
8. DNS server Configuration
9. VLAN configuration
10. FIREWALL

Course Title: Software Testing

Course Code: DCA-EL8

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
- To learn how to plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

Course Outcomes:

At the end of the course students will be able to do:

CO1 : Understand testing of web applications and automated testing tools.

CO2 : Apply modern software testing processes in relation to software development and project management.

CO3 : Create test strategies and plans, design test cases, prioritize and execute them.

CO4 : Develop an ability to understand and identify various software testing problems and solve them.

Syllabus

Software testing principles - Software Testing- Need for testing, Psychology of testing, Testing economics, SDLC and Testing, Verification & Validation. Quality Assurance, Quality Control. [2Hrs]

Testing strategies and types - White box testing techniques - Statement coverage, Branch Coverage, Condition coverage, Decision/Condition coverage, Multiple condition coverage, Dataflow coverage, Automated code coverage analysis, Inspections, Walkthroughs Code Review. [4Hrs]

Black box testing techniques - Boundary value analysis, Robustness testing, Equivalence partitioning, Syntax testing, Finite state testing, Levels of testing, Unit, Integration and System Testing, Compatibility Testing, Domain Testing, Adhoc Testing, Use of Requirement, Traceability Matrix. [5Hrs]

Integration Testing Waterfall - Top-down, Bottom up, Big bang, Sandwich. [2Hrs]

System and Performance Testing - Types of system testing, Functional and non-functional testing Acceptance Testing, Setting entry and exit criteria for phases and typical product release scenarios, Basic factors governing performance testing, Methodology for performance testing, Tools for performance testing. [4Hrs]

Regression Testing - Purpose, Timing, Choice of tests, Smoke tests, Best practices. [2Hrs]

Internationalization and Localization test - Preliminary concepts, Adhoc testing, Pair testing, Extreme testing, Agile testing, Exploratory testing, Defect seeding. [3 Hrs]

Usability Testing - Factors in usability testing, Aesthetics testing, Accessibility testing Tools for usability testing. [2Hrs]

Testing object oriented software - Definitions and Challenge differences from testing non-OO Software, Class testing strategies Class Modality, State-based Testing, Message Sequence specification. [3Hrs]

People and organizational issues in testing - Common people issues and myths in testing, distributed testing teams and success factors. [5 Hrs]

Test Management and Automation – Test Planning, Test Management, Test Process, Test Reporting, Test Automation, Factors to consider in automation, Challenges in test automation, Test Metrics, Product Metrics, and Progress Metrics. Use of metrics in ascertaining product release. [5 Hrs]

Importance of documentation-, Need for Software Documentation, Different types of documentation, Understanding task orientation, Analyzing users, Writing user scenarios, User informational needs, Document goals, User work motivations, User analysis checklist. **[3Hrs]**

Maintenance- The Context Of Maintenance- Definitions, Economics of Maintenance, Evolution of Software Products, Maintaining systems effectively, categorizing Software products, Deployment Models, types of maintenance **[3Hrs]**

Software Configuration Management – Baseline, Identification, Accounting, control, Audit, Source and Version Control **[2Hrs]**

References:

1. Software Testing- Principles and Practices, SrinivasanDesikan and Gopaldaswamy Ramesh.
2. Integrated Approach to Software Engineering, PankajJalote, Narosa Edition.
3. Software Engineering – A Practitioners Approach, Roger Pressman.

Lab: Software Testing

Credit: 01

Marks: 25

List of suggested practical's using any testing tool such as Quick Test Professional or equivalent:

- | | |
|-------------------------------------|------|
| 1. Planning Test Cases | (1P) |
| 2. Generating Test Cases/Test Suite | (2P) |
| 3. Enhancing Tests | (3P) |
| 4. Debugging Tests | (2P) |
| 5. Running Tests | (2P) |
| 6. Analyzing Results | (1P) |
| 7. Reporting Defects | (1P) |

Course Title: Server Side Programming

Course Code: DCA-EL9

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Client Side Technologies (DCA13)

Course Objective:

To give an understanding the web software development: how it is different, issues involved in it.

Course Outcomes:

At the end of the course students should be able to :

CO1 : Get hands-on programming experience using open -source software, PHP and MySQL to build professional-quality, database-driven websites.

CO2 : Develop the skills to build interactive web sites with authentication and security by integrating PHP with HTML and CSS.

CO3 : Apply basic and advanced object-oriented programming techniques, use libraries, frameworks and advanced database connectivity techniques, and integrate PHP with other web technologies to build secure e-commerce applications.

CO4 : Customize an application to meet the specific needs of a client use case as would be done in a real-world application.

Syllabus

Principles of OOP:

OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP. **[4 Hrs]**

Web Technologies:

Introduction to Web technology, Web pages and Browsing, Dynamic Web Pages, Java script, Dynamic web document technologies - PHP, JSP, ASP, Active web pages and Active Web technologies. **[3 Hrs]**

Tags, Escaping from HTML, Types:

Resources, NULL, Callbacks, Type juggling. [4 Hrs]

Variables:

Basics, Predefined variables and Scope, Constants: Syntax, Magic constants, Expressions.

[4 Hrs]

Operators, Control structures, Functions, Predefined exceptions [4Hrs]

Security:

Introduction, General considerations, Installed as CGI binary, Installed as an Apache module, File system Security, Database Security, Error Reporting, Using Register Globals, User Submitted Data, Hiding PHP.

[9 Hrs]

Features:

HTTP authentication with PHP, Cookies, Sessions, Handling file uploads, Connection handling, Persistent Database Connections, DTrace Dynamic Tracing.

[12 Hrs]

Ajax :

Request objects creation, forwarding the request, accepting response object and display on webpage.

[5 Hrs]

Reference Books

1. Steven Holzner, "PHP: The Complete Reference", Tata Mcgraw Hill
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL: Create - Modify – Reuse", Wiley India Private Limited
3. Tim Converse, "PHP 5 and MySQL Bible", Wiley India Private Limited
4. Meloni J.C., "Teach yourself PHP, MySQL and Apache all in one", Pearson Education
5. Stephen J. Schrader, "AJAX", imported edition.

Web Reference:

1. <http://in1.php.net/manual/en/index.php> for PHP v 5.5 and above

Lab : Server Side Programming

Credit : 1

Marks : 25

Suggested list of practical (Numbers in brackets indicate number of practical's)

1. Creating dynamic web pages with PHP (3P)
2. Authentication, Cookies, Session management (1 P)
3. Error handling (1 P)
4. Database connectivity (3 P)
5. Using framework like CodeIgniter (1 P)
6. Ajax implementation (1 P)
7. File uploading (1 P)
8. Uploading and images to and from server (1 P)

Course Title: Data Structures

Course Code: DCA-EL10

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Knowledge of Programming

Course Objectives:

To understand different methods of organizing data and efficiently implement different data structures.

Course outcome:

At the end of the course students should be able to do:

CO1 : Define relevant standard algorithms for various data structures.

CO2 : Learn various applications of data structures.

CO3 : Implementation of data structures.

CO4 : Use of various data structures for sorting and searching.

CO5 : Analyze and compare algorithms for efficiency using Big-O notation.

CO6: Formulate new solutions for programming problems.

Syllabus

1. Introduction to data structures: [3Hrs]

Concept, Data type, Data object, ADT, Need of Data Structure, Types of Data Structure

2. Algorithm analysis: [3Hrs]

Algorithm – definition, characteristics, Space complexity, time complexity, Asymptotic notation (Big O)

3. Linked List: [8Hrs]

Introduction to List, Implementation of List – static & dynamic representation, Types of Linked List, Operations on List, Applications of Linked List, polynomial manipulation, Generalized linked list – concept & representation.

4. Stacks: [8Hrs]

Introduction, Representation-static & dynamic, Operations, Application - infix to postfix & prefix, postfix evaluation, Simulating recursion using stack.

5. Queues: [5Hrs]

Introduction, Representation -static & dynamic, Operations, Circular queue, priority queue (with implementation), Concept of doubly ended queue.

6. Trees: [10Hrs]

Concept & Terminologies, Binary tree, binary search tree, Representation – static & dynamic, Operations on BST – create, Insert, delete, traversals (preorder, in order, postorder), counting leaf, non-leaf & total nodes, non recursive inorder traversal, Expression Tree.

7. Graph: [8Hrs]

Concept & terminologies, Graph Representation – Adjacency matrix, adjacency list, Traversals – BFS & DFS, Application of BFS, DFS – Shortest path, Backtracking.

Text Book:

Horowitz Ellis, Sahni Sartaj, *Fundamentals of Data Structures in C*, University Press, 2nd Edition, 2008.

Reference:

1. Michael T. Goodrich, Roberto Tamassia , *Data Structures and algorithms in Java*, John Wiley & sons inc., 5th Edition, International Student version.
2. Langsam Yedidyah, Augenstein J. Moshe, Tenenbaum M. Aaron , *Data Structures using C and C++*, Pearson Education, Second Edition ,2009
3. Gilbeg Richard, Forouzan Behrouz, *Data Structures: A Pseudocode Approach with C++*, Cengage Learning, Second Edition

Lab: Data Structures

Credit: 1

Marks: 25

Programs using C language / Java Language that covers the following concepts:

1. Stack: Static/Dynamic stack implementation. (1 P)
2. Stack: infix to postfix. (1 P)
3. Stack: Evaluation of Postfix expression. (1 P)

4. Queues: Static and Dynamic Queue Implementation	(1 P)
5. Queues: Circular queue	(1 P)
6. List: Singly Linked List	(1 P)
7. List: Doubly Linked List	(1 P)
8. List: Circular Linked List	(1 P)
9. Linked List: Polynomial addition	(1 P)
10. Trees: Binary Search Tree: create, add, delete, display nodes.	(2 P)
11. Trees: BST traversal.	(1 P)
12. Graph: Representation of Graphs, Graph Traversals.	(1 P)
13. Graph: DFS, BFS.	(1 P)

Course Title: Accounting and Financial Management

Course Code: DCA-EL11

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Knowledge of Accounting

Course Objectives:

This course aims to produce knowledge, skills and understanding of accounting and financial management. It gives detail knowledge about the most important components of accountancy i.e. financial statements and Budgeting.

Course outcome:

At the end of the course students will be able to:

CO1: Develop the skills of accountancy and book keeping with the help of software.

CO2: Prepare budget and business plan for the firms.

Syllabus

Financial Accounting: An Introduction [4Hrs]

Meaning and Nature of Accounting, Accounting as language of Business and Accounting as information system. Accounting processes and final output of Accounting system. Principles of Accounting and double entry system. Recording of Transaction in Journal, Posting of transaction to Ledger and preparation of Trial Balance.

Preparation of Final Financial Statement [6Hrs]

Preparation of Final Accounts – Profit and Loss account and Balance Sheet. Preparation of statement of changes in Financial Statements – Funds Flow Statement and Cash flow statement.

Analysis of Financial Statements [4Hrs]

Horizontal (Trend) analysis and Vertical (Common-Size) analysis. Ratio Analysis – Liquidity ratio, Turnover ratio, Profitability ratio.

Cost Accounting: An Introduction [7Hrs]

Meaning, nature and importance of cost Accounting system in an Organization. Elements of Cost and various cost Concept – Direct and indirect cost, Fixed and Variable costs, Sunk Cost Opportunity Cost, Out of Pocket and Imputed cost, Preparation of cost sheet. Understanding the nature of variable cost and fixed cost (total as well as per unit). Contribution, P/V ratio, Break Even Point. Assumptions of Cost-Volume - Profit Analysis and studying the relationship between Cost, Volume and Profit.

Budgeting [2Hrs]

Meaning, Importance and Objective of budgeting in an Organization, Different types of Budgets including preparation of cash Budget, fixed and flexible budget, Zero based budgeting.

Financial Management: An Introduction [4Hrs]

Nature, Objective and Scope, Financial decision making and type of financial decision. Role of Finance Manager in Organization. Basic axioms of Financial Management. Risk-Return framework for financial decision making.

Time Value of Money and Mathematics of Finance [4Hrs]

Time Value of Money and Opportunity cost of Money, Present value and future value and Interest rate and discount rate Annuities and their types, Numerical related to the calculation of present values and future values.

Capital Budgeting Decisions [4Hrs]

Nature and kinds of Capital budgeting decisions. Techniques of evaluating Capital budgeting decisions – Payback Period, Accounting rate of return, NPV, IRR and Profitability Index.

Cost of Capital and Sources of Finance [4Hrs]

Basic valuation Model, Concept of Cost Capital – Weighted average Cost and Marginal Cost, Cost of debt and cost of Equity, Various long term sources of funds for a Organization.

Capital Structure and Dividend Decisions [4Hrs]

Concept of Capital Structure, Financial Leverage and Capital Structure, Determinants of Capital Structure, Dividend and its forms – cash dividend, right and bonus shares and buy-back of shares, determinants of Dividend Policy of firm.

Working Capital Management [2Hrs]

Basics of Working Capital management: Meaning of Gross and Networking Capital, Components of Working Capital. Risk-Return framework for Working Capital Decisions.

Main Reading

- 1 Pandey I. M., “Financial Management”, 7th Edition, 2002, Vikas Publishing Pvt Ltd.
- 2 M. Y. Khan and P.K. Jain, “Management: Accounting” 2nd Edition 1995, Tata McGraw-Hill Publishing, New Delhi
- 3 Maheshwari S.N. “Accounts” 2002, Vikas Publishing Pvt. Ltd.

Lab : Accounting and Financial Management

Credit: 1

Marks: 25

- | | |
|---|------|
| 1. Journal entry | (1P) |
| 2. Book keeping using software. | (2P) |
| 3. Balance sheet | (2P) |
| 4. Balance sheet using software. | (2P) |
| 5. Numerical related to the calculation of present values and future values | (2P) |
| 6. Preparation of budget of a hypothetical firm | (2P) |
| 7. Returns on share of a hypothetical firm | (2P) |
| 8. Dividend policy of a hypothetical firm | (2P) |

Course Title: Mobile Application Development

Course Code: DCA-EL12

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses:

- Client Side Technologies(DCA13)
- Object Oriented Programming

Course Objective:

Students learn how to develop applications for mobile devices, including smart phones and tablets. Students are also introduced to the current mobile platforms, mobile application development environments and mobile device input methods. Students will design and build a variety of apps on a popular platform throughout the course to reinforce learning and to develop real competency.

Course Outcome:

At the end of the course students will be able to :

CO1: Explain mobile devices, including their capabilities and limitations.

CO2: Review current mobile platforms and their architectures.

CO3: Develop mobile applications on a popular mobile platform.

CO4: Evaluate development with another mobile platform.

Syllabus:

Introduction to mobile devices

[3Hrs]

Mobile devices vs. desktop devices, Why we Need Mobile App, Different Kinds of Mobile Apps, ARM and intel architectures, Power Management, Screen resolution, Touch interfaces, Application deployment - App Store, Google Play, Windows Store, Development environments – Android Studio, PhoneGAP, Native vs. web applications.

Review of HTML5/JS/CSS3

[2Hrs]

Quick recap of technologies, Mobile-specific enhancements, Browser-detection, Touch interfaces, Geolocation, Screen orientation, Mobile browser “interpretations” (Chrome/IE).

Mobile OS Architectures

[3Hrs]

Comparing and Contrasting architectures of Android, iOS and Windows, Underlying OS(Darwin vs. Linux vs. Windows), Kernel structure and native level programming, Runtime (Objective-C vs. Dalvik vs. WinRT), Approaches to power management, Security.

Android overview

[2Hrs]

Introduction to Android. Overview of android stack, Introduction to OS layers, Android features.

Linux Kernel, Libraries, Android Runtime, Application Framework, Dalvik VM

Android Components – Introduction

[3Hrs]

Activities, Services, Broadcast Receivers, Content Providers.

Building UI with Activities [4 Hrs]

Activities, Views, layouts and Common UI components, Creating UI through code and XML, Activity life cycle, Intents, Communicating data among Activities.

Advanced UI [5Hrs]

Selection components (GridView, ListView, Spinner), Adapters, Custom Adapters, Menus, Toast, Custom Toast, Dialogs, Status bar Notifications.

Multithreading [4Hrs]

Using Java Multithreading classes, Async Task, Handler, Post.

Intent, Intent Filters and Broadcast Receivers [4Hrs]

Role of filters, Intent-matching rules, Filters in your manifest, Filters in dynamic Broadcast Receivers, Creating Broadcast receiver, Receiving System Broadcast, Understanding Broadcast action, category and data, Sending Broadcast.

Data Storage [5Hrs]

Shared Preferences, Android File System, Internal storage, External storage. SQLite Introducing SQLite, SQLiteOpenHelper and creating a database, Opening and closing a database, Working with cursors, inserts, updates, and deletes.

Content Providers [5Hrs]

Accessing built in content providers, Content provider MIME types, Searching for content, Adding, changing, and removing content, Creating content provider, Working with content files.

Services [5Hrs]

Overview of services in Android, Implementing a Service, Service lifecycle, Inter Process Communication (AIDL Services).

Web Services and WebView - Consuming web services, Receiving HTTP Response (XML, JSON), Parsing JSON and XML, Using WebView.

Reference books:

1. Beginning Android 4 Development, Wei-Ming Lee(John Wiley & Sons)
2. Pro Android 4 ; SatyaKomateneni, Dave MacLean (Apress)
3. Hello Android - Introducing Google's Mobile Development platform - Ed Brunette (The Pragmatic Bookshelf)

4. Android Apps with Eclipse 1st Edition, OnurCinar(Apress)
5. Android- A Programmer'S Guide, Dimarzio, J.F.(Tata McGraw Hill)

Web References:

1. <http://developer.android.com/index.html>
2. <http://www.appinventor.org/>

Lab : Mobile Application Development

Credit: 1

Marks: 25

List of practicals:

1. Getting Started with Android – Installing the Development Environment, Configuring Android Stack (1P)
2. Creating the First Android Application - Creating a Simple Android Project, Debugging Application through DDMS. Setting up environment. AVD Creation, Executing Project on Android Screen. (1P)
3. Android application development - Use of GUI components to implement a simple application such as a Calculator. (1P)
4. Review the earlier application making use of the advanced UI components. (1P)
5. Implementing Data storage application - an application to make Insert , update , Delete and retrieve operation on the database. (2P)
6. Understanding content providers and permissions: Read phonebook contacts using content providers and display them suitably. (1P)
7. Optimizing your app performance with Services/Multithreading/Multiprocessing (2P)
8. Mini Project (3P)

Course Title: Office Automation Tools

Course Code: DCA-EL13

Marks: 75

Credits: 3

Duration: 45 Hrs

Course Prerequisites: Nil

Course Objectives:

- The main objectives of this course to provides basic training of computer and its most common software use in office work..

Course Outcome:

At the end of the course students will be able to :

CO1: Understand basic Spreadsheet features.

CO2 : Work with different worksheets.

CO3: Analyze the data using various graphs.

CO4 : Analyze data using various spreadsheet features such as lookup tables, Pivot tables, and other statistical features.

CO5 : Use different features of DTP software.

CO6: Develop a desktop Publishing Application using given software.

Syllabus

Spreadsheets:

[8Hrs]

Spread Sheet & its Applications, Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data filling. Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row.

Mathematical operations:**[6Hrs]**

(Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets- Labeling columns & rows, Formatting- Cell, row, column & Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Using Tools – Error checking, Spell Checks, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

LATEX:**[6Hrs]**

Introduction – Introduction to LATEX, and TEX, LATEX over Word-processor, Formatting and Syntax. Writing MATH formulas.

Adobe In Design**[10Hrs]**

Introduction to InDesign:Introducing the Workspace, Getting to Know InDesign, setting up a Document and Working with Pages

Learning all the primary Tools:Working with Frames, Importing and linking Graphics, introduction to masterpages, Importing and Editing text, Working with typography

Constructing a publication: setting up pages, using master pages, creating and adjusting layouts for newspapers, brochures etc., numbering pages.

Corel Draw: - Graphic design: -**[15Hrs]****Introduction to CorelDraw:**

Introduction to Corel Draw, Features of Corel Draw Corel Draw Interface, learning about Raster and Vector Graphics.

Basic Drawing Skills: Selecting and Manipulating Objects, Drawing and Shaping Objects, Arranging Objects, learning about raster and vector graphics.

Mastering Different Tools: Using Text and Color, Working with Color Palette, Text Special Text Effects, align and distribute, transformation tools, Shaping etc.

Applying Special Effects: Learning Blending options, Distortion, Contour Effects, Envelope effect, Transparency Power Clip.

Working with Images: Working with images, applying special effects, editing bitmap.

Saving, Exporting and printing: Different Saving options, exporting your designs into different formats for printing, Creating layouts and finalizing content for printing.

Text Books:

1. PageMaker-Complete by R. Shamms, Mortier&Rick Wallacl ,Techmedia
2. Straight to the Point – MS Office 2003 By Dinesh Maidasani, Publisher: firewall
- 3:Mastering Excel: Building Dashboards by Mark Moore

Reference Books:

1. Learning PageMaker 7 by Ramesh Bangia of Khanna Book Publishing Co Pvt Ltd
2. Master Visually Microsoft Office 2003 By Michael S. Toot, Publisher: visual
3. Mastering WORD 6 for Windows - Mansfield – BPB
4. Mastering EXCEL 4 for Windows - Townsend –BPB

Lab : Office Automation Tools

Credit : 01

Marks: 25

List of practicals

PART-I**(6P)****1. Using formulas and functions:**

To prepare a Worksheet showing the monthly sales of a company in different branch, offices (Showing Total Sales, Average Sales).Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student).

2. Operating on the sheets:

Finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.

3. Creating a Chart:

To create a chart for comparing the monthly sales of a company in different branch offices.

4. Using the data consolidate command:

To use the data consolidate command to calculate the total amount budgeted for all departments (wages, travel and entertainment, office supplies and so on) or to calculate the average amount budgeted for – say, department office expenses.

5. Sorting Data, Filtering Data and creation of Pivot tables.**6. Creating a well formatted document using LATEX.**

PART-II

CorelDraw/Page Maker

(9P)

1. Introduction
2. Basic Drawing Skills
3. Using Text and Color
4. Working with Objects
5. Adding special effects
6. Creating output
7. Layout and layers
8. Styles and templates
9. Advanced Effects.

Programme Outcome (PO) for PGDCA

Programme Outcomes :

- PO1 : Students will gain problem-solving skills, especially the ability to analyze, design and implement solutions.
- PO2 : Students will possess the technical skills for to be employed in a competitive position in the IT field.
- PO3 : Students will be empowered with skills that will help them to start an Entrepreneurial venture.
- PO4 : With a wide range of electives offered, students can work in different fields like content development, Multimedia, Website designing, Networking , Banking industry etc.
- PO5 : Students can take up a career in academic field.
- PO6 : Students scoring 60% and above at PGDCA with minimum 45% at B.Sc. Computer Science/B.C.A./equivalent are eligible for M.Sc. IT programme offered in ParvatibaiChowguleCollege of Arts and Science (Margao)

ANNEXURE IV

Parvatibai Chowgule College of Arts and Science
(Autonomous)
DEPARTMENT OF COMPUTER SCIENCE
COURSE STRUCTURE
Post Graduate Diploma in Computer Applications (PGDCA)
To be Implemented from 2020- 2021

Semester I (20 credits)

Course Code	Course Type	Course Name	Credits	Contact (hrs/week)	
				L	P
DCA11A	Core – I	Problem Solving and Introduction to Programming	4	3	1
DCA12	Core – II	DataBase Management Systems	4	3	1
DCA13	Core – III	Client Side Technologies	4	3	1
DCA14	Elective – I	Elective Course I	4	3	1
DCA15	Elective – II	Elective Course II	4	3	1

Semester II (20 credits)

Course Code	Course Type	Course Name	Credits	Contact (hrs/week)	
				L	P
DCA21	Core – IV	Computer Networking	4	3	1
DCA22	Core – V	Software Engineering	4	3	1
DCA23	Elective – III	Elective Course III	4	3	1
DCA24	Elective – IV	Elective Course IV	4	3	1
DCA25	Elective – V	Elective Course V	4	3	1

L – Lectures ---> 1 Hour Duration

P – Practicals --->2 Hours Duration

List of Elective Courses

EL1. Multimedia

EL2. E-Learning

EL4. HCI

EL5. E-commerce

EL6. Digital Marketing

EL7. Network Administration

EL8. Software Testing

EL9. Server Side Programming

EL10. Data Structures

EL13. Office Automation Tools

EL14. Assessment and Evaluation for Learning

EL15. Instructional Design

EL16. Content Management System

Course Title: Problem Solving and Introduction to Programming

Course Code: DCA 11A

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To understand the concept of basic computer algorithm and flowchart and use the algorithm for various problem solving.
- To implement algorithms using high level programming language.
- To understand basic principles of programming – example Python.

Course Outcomes:

Upon completion of the course students will be able to:

C01: Explain problem solving strategies.

C02: Draw a flowchart for a given problem.

C03: Write an algorithm for a given problem.

C04: Implement sorting and searching algorithms.

C05: Recognize and incorporate programming elements such as loops, decision making, functions, string, list, tuple, dictionary and files in to applications that solve real world problems.

SYLLABUS:

UNIT I:

[10 HRS]

Introduction to Computer Problem Solving : Algorithm, Flowchart, The Problem-Solving Aspect, General problem-solving strategies, Top-Down Design, Implementation of Algorithms, Efficiency of Algorithms, Recursive algorithms.

Basic Algorithms : Exchanging the values, Summation of a set of numbers, factorial computation, generation of the Fibonacci series, reversing the digits of an integer, base conversion.

Factoring Methods : Finding divisors of an integer, finding the Greatest Common Divisor of two integers, generating prime numbers, computing prime factors of an integers.

Sorting and Searching : Bubble sort, Insertion Sort, Sequential Search and Binary Search.

UNIT II

[20 HRS]

Introduction to Python

Motivation, programming paradigms, What Python can do, Python's technical strength, Python interpreter, Program execution, Execution model variations, How to run programs.

Basic Syntax

Variable and Data Types, Operator, Conditional Statements - if, if- else, Nested if-else. Looping – For, While, Nested loops. Control Statements – Break, Continue, Pass.

String Manipulation

Accessing Strings, Basic Operations, String slices, Function and Methods.

Lists

Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Tuple

Introduction, Accessing tuples, Operations, Working, Functions and Methods.

Dictionaries

Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions.

UNIT III

[15HRS]

Functions

Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

Modules

Importing module.Math module.Random module.Packages. Composition.

Input-Output

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

Exception Handling

Exception. Exception Handling - Except clause, Try ?finally clause. User Defined Exceptions

REFERENCES:

MANDATORY:

- 1.Mark Lutz, Learning Python, O'Reilly Media, Third Edition, 2008
- 2.Dromey R.G., How to solve it by computer, Prentice Hall of India, 2nd Edition, 2004.
- 3.Alex Martelli, Python – A Nutshell, O'Reilly Media, Second Edition, 2006
- 4.Wes McKinney, Python for Data Analysis, O'Reilly Media, 2012

WEB BASED:

- 1.<https://www.w3schools.com>
- 2.<https://www.tutorialspoint.com>
- 3.<https://www.javatpoint.com>
- 4.<https://www.geeksforgeeks.org>

[5.https://www.guru99.com](https://www.guru99.com)

Practicals: Problem Solving and Introduction to Programming

Credit: 01

Marks: 25

Duration: 30 Hrs

List of Experiments using Python Language:

- 1) Program to compute a given formula
- 2) if else
- 3) nested if else
- 4) loop
- 5) loop
- 6) string manipulation
- 7) string manipulation
- 8) list
- 9) tuple
- 10) dictionary
- 11) function
- 12) module
- 13) Input-Output
- 14) Input-Output
- 15) exception handling

Course Title: Data Base Management Systems

Course Code: DCA12

Marks: 75

Credits: 3

Duration : 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To provides basic knowledge of a database management system.
- To understand importance of ER diagram.
- To formulate queries in Relation Algebra and SQL for Database Manipulations
- Develop database systems using RDBMS.

Course outcome:

At the end of the course students will be able to:

C01: Explain database concepts and the need for the same.

C02:Identify different entities and relationship between them.

C03:Represent the given system diagrammatically using ER diagram.

C04:Convert an ER diagram to a schema and effectively represent it using appropriate RDBMS.

C05:Formulate queries in Relational Algebra, SQL to manipulate the database.

C06:Analyze the schema to see if they fulfill Normalization criterion

SYLLABUS:

UNIT I

[15HRS]

Overview of database management: Data, information, database, database management system; Managing data; File systems versus a DBMS, advantages of a DBMS; Data abstraction, instances and schemas, data models; Data manipulation language, data definition language; Architecture of a DBMS; Users of a DBMS, database administrator.

Database design: Design phases – conceptual design, logical design, physical design; ER model – entities, attributes, and relationships, mapping cardinalities, keys; ER diagrams – strong entities, weak entities, generalization, specialization, aggregation; Converting ER diagram to relational schemas.

UNIT II

[15HRS]

Relational model: Relation, properties of relational model; Entities, integrity constraints, referential integrity constraints; Relational algebra – select, project, cross product, set operations, rename operation;

Functional dependency and normalization: Atomic domain, nested relation; Key, super key, primary key, candidate key; Functional dependency, axioms, closure of a set of attributes, closure of a set of functional dependencies

UNIT III

[15HRS]

SQL: Basic structure of SQL query – Create, select, where, from, rename operation; Set operations; Aggregate functions; Group by, having clauses; Nested queries; Views; Insert, delete, update.

Introduction to transactions: Transaction concept, Transaction state, ACID properties, Concurrent Transactions, Serializability.

MANDATORY:

1. A Silberschatz, H F Korth, S Sudarshan, Database system concepts, McGraw-Hill ,sixth Edition.

SUPPLEMENTARY:

1. Ramakrishan, J Gehrke, "Database management systems", McGraw-Hill , 3rd edition.
2. R Elmasri, S B Navathe, "Fundamentals of database Systems", Pearson Education , 5th Edition.

WEB BASED:

1. <https://www.tutorialspoint.com/dbms>
2. <https://beginnersbook.com/2015/04/dbms-tutorial/>
3. <https://www.guru99.com/dbms>
4. <https://www.javatpoint.com/dbms>

Practicals: Database Management Systems

Credit: 1

Marks: 25

Duration: 30 Hrs

List of Practical

1. ER diagram (1P)
2. ER diagram with specialization/generalization and aggregation.(1P)
3. Converting ERD into Schema.(2P)
- 4 SQL (2P)
- 5 Nested Queries (2P)
- 6 Normalization(2P)
- 7 Report Writing (1P)
8. Mini project (4P)

Course Title: Client Side Technologies

Paper Code: DCA13

Marks: 75

Credits: 3

Duration : 45 Hrs

Prerequisite Courses: Nil

Course Objective:

- To develop a high degree of competence as a web designer.

Course Outcomes:

On completion of the course students will be able to :

CO1: Design Content for a web application

CO2: Style content so as to provide an effective User Interface

CO3: Provide for dynamism in the User Interface to enhance usability

CO4: Develop a static web application

SYLLABUS:

Unit I: The Internet and Content Development

[20HRS]

Computer Networks: LAN, MAN, WAN, etc., Layout (Ring, bus, star, etc.), IP address: public, private, static, dynamic, Internet protocols and services: http, https, FTP, SMTP, Telnet, DNS, DHCP, Intranet & Extranet, Internet Infrastructure, Search Engines, Web Browser, Web server.

Basic HTML : Introduction, importance, Basic: HTML Tag, HEADER Tag, META Tag, TITLE Tag, BODY Tag, Text Formatting: PRE Tag, FONT Tag, entities, Image: IMG tag, image maps, Hyperlinks: Anchor tag, Lists: Unordered Lists, Ordered Lists, Definition Lists, Table tags: TABLE, TR and TD Tags, Cell Spacing and Cell Padding, Colspan and Rowspan. End user Interaction: FORM and INPUT Tag, Text Box, Radio Button, Checkbox, SELECT Tag and Pull Down Lists, TEXTAREA, Hidden, Submit and Reset, Special Tags : COLGROUP, THREAD, TBODY, TFOOT, blank, self, parent, top, IFRAME, LABEL, Attribute for <SELECT>.

HTML5: The <canvas> element for 2D drawing, The <video> and <audio> elements for media playback, Support for local storage, New content-specific elements, like <article>, <footer>, <header>, <nav>, <section>, New form controls, like calendar, date, time, email, url, search.

UNIT II: Styling UI

[15HRS]

CSS: Introduction to CSS, Advantages, Types of style sheets: Inline, Internal, External, Multiple Style sheets and Cascading order, Grouping or nesting, Syntax, ID and Class, Pseudo-class, Pseudo-element, CSS units of measurement, Colors.

New features in CSS3: Selectors, Box Model, Backgrounds and Borders, Image Values and Replaced Content, Text Effects, 2D/3D Transformations, Animations, Multiple Column Layout, User Interface.

UNITIII: Dynamic UI

[10HRS]

Client side scripting: Introduction to Javascript, HTML DOM, Core Javascript, form validations.

REFERENCES:

MANDATORY:

1.DT Editorial Services, **Web Technologies, Black Book, 2018, DreamTech**

WEB BASED:

- 1.<https://www.w3schools.com>
- 2.<https://www.tutorialspoint.com/html/index.htm>3.<https://www.tutorialspoint.com/css/index.htm>
- 4.<https://www.tutorialspoint.com/javascript/index.htm>
- 5.<https://www.udemy.com/courses/development/web-development/>

Practicals: Client Side Technologies

Credit: 1

Marks: 25

Duration: 30 Hrs

HTML: [2 P]

- 1. Text formats.
- 2. Image formats.
- 3. Hyperlink and Listings
- 4. Table formats
- 5. Forms

Cascading Style Sheet: [2 P]

- 1.Internal and External style implementations
- 2.Creating Dynamic pages using CSS.

Javascript: [4 P]

- 1. Implementing functions in javascript (alert(); confirm(); prompt())
- 2. Form Validations using Javascript
- 3. Creating Dynamic pages using Javascript. HTML5:

Web site design using HTML5. [4 P]

- Implementation of canvas.
- Embedding Audio and Video in a Webpage.
- Implementation of additional form controls.

Course Title: Computer Networks

Course Code: DCA21

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To understand the basic concepts of Computer Networking.
- To understand the layered architecture of computer networks.
- To understand various transmission media used for networking.
- To understand working of various protocols in different layers.

Course Outcomes:

At the end of the course students will be able to:

C01: Appreciate the need for Network and various layers of OSI and TCP/IP reference model.

C02: Explain various Data Communications media.

C03: Identify the different types of network topologies and Switching methods.

C04: Describe various Data link Layer Protocols.

C05: Identify the different types of network devices and their functions within a network.

C06: Compare various Classless and Classful IP addresses with Subnetting concept.

C07: Analyze and Interpret various Network and Transport Layer protocols

C08: Explain different application layer protocols

SYLLABUS:

UNIT I : Basics of Computer Networks, Transmission Media and Data communication [15HRS]

Components

Basics of Computer Networks : Networking of Computer - Advantages and disadvantages of computer networking. Types of Networks - LAN, MAN, WAN, Wireless; Network Topology – Star, Ring, Bus, Tree, Complete, Irregular; Reference Models - The OSI reference model, the TCP/IP reference model. Telephone System: Structure of telephone system, the local loops, trunks; Switching - Circuit switching, message switching, Packet Switching.

Transmission Media : Transmission media - Magnetic media, twisted pair, co-axial cable (baseband and broadband), fiber optics principle, transmission of light through fiber, fiber cables, fiber optics network, comparison of fiber optic and copper wire. Wireless Transmission (The electromagnetic spectrum, Radio Transmission, Microwave Transmission, Infrared and Millimeter Waves, Light wave Transmission)

Data Communication Components: Modem, Repeaters, Hubs, Bridges, Switches, Routers, Gateways.

UNIT II : Data Link layer and Medium Access Control Sublayer (MAC)

[10HRS]

Data Link Layer Protocols: Asynchronous, Synchronous, Character Oriented and Bit Oriented Protocols. Error Control, Internet.

Medium Access Control Sublayer (MAC): Multiple Access Protocols, CSMA Protocols, Collision-Free Protocols (Bit Map protocol, Binary countdown), 802.3 Frame Header, Ethernet: Ethernet Cabling, Manchester Encoding, The Ethernet MAC sublayer protocol, The Binary exponential backoff algorithm, Switched Ethernet, Fast Ethernet, Gigabit Ethernet.

UNIT III : Network Layer, Transport Layer and Application layer [20HRS]

Network Layer: IP Address class, Network and Host Addressing, Subnet, Subnet Mask. TCP/IP Protocol Suite, Services, Static vs Dynamic address, Shortest Path Routing Algorithm, IP Protocol Header, Address resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP).

Transport Layer: User Datagram Protocol (UDP), UDP Header, Transmission Control Protocol (TCP), Segment Header, Connection Establishment and Release.

Application Layer :Telnet (Terminal Network), HTTP, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP).

REFERENCES:

MANDATORY:

1. Behrouz A. Forouzan B. (2017) Data communication and Networking (5th ed.). McGraw Hill Education
2. Tanenbaum A., W. (2010) Computer Networks (5th ed.) . Pearson
3. Kurose J, K. (2017) Computer Networking – A Top-Down Approach (6th ed.) Pearson Education,

WEB BASED:

<https://www.youtube.com/watch?v=tj7f244tubM>

<https://www.youtube.com/watch?v=vFypCugyFoM>

3. https://www.tutorialspoint.com/data_communication_computer_network/index.htm

[https://www.cisco.com > training-events > netacad > course_catalog > docs](https://www.cisco.com/training-events/netacad/course_catalog/docs)

Slides for the book Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw – Hill, 2011, 4th Edition : <http://www.mhhe.com/engcs/compsci/forouzan/dcn/index.mhtml>

Practicals: Computer Networks

Credit: 1

Marks: 25

Duration: 30 Hrs

- | | |
|--|-------|
| 1. Installing OS and drivers | (1 P) |
| 2. Cable colour code and crimping, Demonstration of structured cabling | (1 P) |
| 3. Setting up of network (TCP/IP configuration) | (2 P) |
| 4. Sharing resources (files, printer etc.) | (1 P) |
| 5. Study of Network Commands | (2 P) |
| 6. Setting up of wireless network (Adhoc and Infrastructure mode) | (1 P) |
| 7. Network monitoring tool | (1 P) |
| 8. Study of Wire shark Tool | (3P) |
| 9. Network simulator tool1 | (3P) |

Course Title: Software Engineering

Course Code:DCA22

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses : Nil

Course Objectives:

- To Understand the various software development methodologies and estimation of software projects.
- To analyze and design software projects.
- To study the various phases of a S/W Development Project.

Course Outcomes:

At the end of the course students will be able to:

CO1: Understand the various Software Development Methodologies

CO2: Apply Estimation techniques to live projects

CO3: Analyze Software Projects.

CO4: Design Software Projects.

SYLLABUS:

UNIT I:

[15 HRS]

SOFTWARE PROCESS:

Characteristics of software process. Software Development Processes and Methodologies: waterfall, prototyping, iterative, spiral, unified process. Benefits of iterative and incremental approach with emphasis on Unified process, CASE Tools, Agile methodologies.

PROJECT MANAGEMENT:

Planning a Software Project – Cost estimation, Project Scheduling, Software configuration management plans, Quality Assurance plans, Project Monitoring plans and Risk Management. Techniques such as Interviewing , Requirement Workshop, brainstorming, prototyping. Characteristics of SRS.

UNIT II:

[15 HRS]

OOAD and UML:

OOAD: Definition; object oriented analysis; object oriented design and modeling; Assigning responsibilities.

UML: Main UML diagrams – Class diagram , sequence diagram, activity diagram, use case diagram. Use case model – use case diagram , use case descriptions, use case realization using sequence and activity diagrams. Supplementary requirements. Advanced use case model

features. Requirements: Functional and non-functional System Design : Class diagram, sequence diagram, activity diagram, state chart diagram, deployment diagram. Brief introduction to other UML diagrams.

SOFTWARE ARCHITECTURE PATTERNS:

Major Architectural Styles (patterns) like Layered Architecture, Pipe and Filter, Shared (Central) Data Store, Event Driven, Model-View-Controller (MVC), "Distributed & Emerging" Service Oriented Architecture (SOA) and Elementary GRASP Patterns.

UNIT III:

[15 HRS]

HUMAN COMPUTER INTERACTION:

HCI Definition; User categories, Interface Design-Internal & External Interface design, user interface design, Interface design guidelines.

CODING: Coding styles, standards, peer reviews, checklist.

TESTING: Testing Fundamental, Functional Testing, Structural Testing, Testing Object-Oriented Programs,

Testing Process and Metrics.

DOCUMENTATION and MAINTENANCE: Need for Software Documentation. Types of documentation Need for Maintenance; Types of Maintenance.

REENGINEERING: Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering, The Economics of Reengineering.

REFERENCES:

MANDATORY:

1. Pressman R., (2017) ,Software Engineering: A Practitioners Approach, 6th edition: McGraw Hill
2. Larman C., (2015) Applying UML and patterns, 3rd Edition: Addison Wesley.

SUPPLEMENTARY:

1. Jalote P., (2010) An Integrated Approach to Software Engineering, 3rd Edition : Narosa Publishing House.
2. Sommerville I., (2015) Software Engineering, 10th Edition: Addison Wesley.
3. Fowler M., (2003) UML Distilled, 3rd Edition: Addison Wesley.

WEB BASED:

1. https://www.tutorialspoint.com/software_engineering
2. <https://www.w3schools.in/sdlc-tutorial>
3. <https://www.geeksforgeeks.org/software-engineering>
4. <https://www.javatpoint.com/software-engineering-tutorial>

Practicals : Software Engineering

Credit : 1

Marks : 25

Duration: 30 Hrs

List of suggested PRACTICALS :

For a given project/case study

- 1) Requirements Gathering Techniques [2P]
- 2) Gantt Chart [2P]
- 3) USE Case diagram and Use Case descriptions for the Use Cases [3P]

- | | |
|------------------------|------|
| 4) Class Diagram | [2P] |
| 5) Sequence Diagram | [2P] |
| 6) Activity Diagram | [2P] |
| 7) State Chart Diagram | [2P] |

ELECTIVES

Course Title: Multimedia

Course Code: DCA-EL1

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To learn the basic Multimedia concepts
- To develop skills and competencies to design graphical images.
- To develop skills to Capture and Edit Audio and Video, using Software tools.
- To build a Multimedia product.

Course Outcomes:

At the end of the course students will be able to:

C01: Explain the concept of Multimedia – Components, Team members and their roles.

C02: Identify and describe the function of the general skill sets in the multimedia industry.

C03: Classify and realize the types of Authoring tools and their functions.

C04: Analyze the requirements of Multimedia product.

C05: Perform the editing features for Images, Sound and Video.

C06: Create animation using basic features.

C07: Develop a multimedia product using any authoring tools.

C08: Assemble and deliver multimedia projects.

SYLLABUS:

UNIT I: Multimedia and Architecture:

[15 HRS]

Introduction: Overview of multimedia, Multimedia building blocks, Digital representation, Interaction techniques and devices, Stages of a Multimedia Project: Planning and Costing, Designing and Producing, Testing and Delivering. The Multimedia team and their roles: Project Manager, Writer, Video specialist, Audio specialist and Multimedia programmer.

Multimedia architecture: Introduction to multimedia architectures, User interfaces, Windows multimedia support, Windows API for Multimedia, Multimedia Database Systems, Media streaming, Multimedia authoring tools, Multimedia OS.

UNIT II: Building Blocks I:

[15 HRS]

Text: Visual representation of text, Digital representation of text, Text file formats: TXT, DOC, RTF, PDF, ODT Conversion to and from of various text formats, Hypermedia and Hypertext.

Image: Basic Image fundamentals, Importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera and its types, etc. various attributes of Images – size, color, depth, resolution, etc, Image data types, image file formats (BMP, JPEG, GIF, TIFF, PNG, DIB, EPS, CIF, PEX, PIC), their features and limitations, graphic file formats conversions.

Sound: Sound and its Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sound-Sampling, Frequency, Sound Depth, Creation of Digital Audio files – recording & editing. Overview of various sound file formats on PC – WAV, VOC, AVI, MP3, MP4, Ogg, Verbose etc. Digital audio vs MIDI and MIDI File format, CD and DVD formats.

UNIT III: Building Blocks II:

[15 HRS]

Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software. Animation on the Web – features and limitations, creating simple animations for the Web. Animation file formats.

Video: Analog and Digital Video, Video on PC. Introduction to graphics accelerator cards, Video Broadcast Standards - NTSC, PAL, SECAM, HDTV. Introduction to video capturing, Media & Instrument – Videodisk, DVCAM, Camcorder.

Recording Formats like S-VHA Video, Component (YUV), Component Digital, Composite Digital, and Video Hardware Resolutions.

Video Tips like shooting platforms, Lighting, Chroma Key or Blue Screen.

Data Compression: Types of compression: Lossy & Lossless, Symmetrical & Asymmetrical, Intraframe & Interframe, Hybrid.

Assembling and delivering a project: The four primary navigational structures used in multimedia like linear, hierarchical, non-linear and composite.

REFERENCES:

MANDATORY:

1. Vaughan Tay, (2011), Multimedia: Making it Work, (8th Ed), Tata McGraw-Hill.

SUPPLEMENTARY:

1. Prabhat K. Andleigh/ Kiran Thakrar, (2015), Multimedia Systems Design, (1st Ed), Pearson Education India.
2. Jeffcoate Judith, (2006), Multimedia in Practice, Technology and Applications, (1st Ed) Prentice Hall India.

WEB BASED:

1. https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
2. <https://www.gimp.org>
3. <https://www.audacityteam.org/>
4. <https://www.topwin-movie-maker.com/tutorials.html>
5. <https://www.minitool.com/moviemaker/use-movie-maker.html>
6. <https://www.coursepath.com/powerpoint-as-e-learning-authoring-tool>
7. <https://elearningindustry.com/powerpoint-as-an-authoring-tool>

Practicals: Multimedia

Credit : 1

Marks: 25

Duration: 30 Hrs

Multimedia Software Tools like GIMP, Audacity, Windows Movie Maker, Blender. iMovie (the numbers in brackets indicate number of practical's):

1. Image Handling: Cropping an image, adjusting image size, increasing the size of the work canvas, saving an image.

[2P]

2. Layers: Adding layers, dragging and pasting selections on to layers, dragging layers between files, viewing and hiding layers, Editing layers, rotating selections, scaling an object, preserving layers transparency, moving and copying layers, duplicating layers, deleting layers, merging layers, using adjustment layers.

[2P]

3. Channels and Masks: Channel palette, showing and hiding channels, splitting channels in to separate image, merging channels, creating a quick mask, editing masks using quick mask mode.

[1P]

4. Painting and Editing: Brushes palette, brush shape, creating and deleting brushes, creating custom brushes, setting brush options, saving, loading and appending brushes, Options palette.

[2P]

5. Opacity, pressure, or exposure, paint fade-out rate, making selections, using selection tools, adjusting selections, softening the edges of a selection, hiding a selection border, moving and copying selections, extending and reducing selections, pasting and deleting selections.

[2P]

6. Recording Sound using Sound Recorder (Capture), Sound capture through sound editing software, Sound editing, Noise correction, Effect enhancement ; Voice Recognition; Importing audio and saving audio from Audio CD. Sound Quality types: CD Quality, Radio Quality, Telephone Quality.

[2P]

7. Video: Record video from video capture devices, webcams, screen capture or even streaming video and Video Editing. [2P]

8. Mini Project/Problem Statement/Case Study (integrating the above experiments) like E-Book Design, Product Design.

[2P]

Course Title: E-Learning
Course Code:DCA-EL2
Marks : 75
Credits : 3
Duration:45 Hours

Prerequisite Courses: Nil

Course Objective:

- This course is an introduction to ICT (Information Communications Technology) in education.
- It aims at exploring the Instructional Design principles, developing and applying the various concepts of Instructional Design skills learnt wrt E-Learning and develop E-content in various application areas related to ICT and Education.

Course Outcomes:

On completion of this course the student will be able to:

- CO1:** Explain the working of an E-learning module.
- CO2:** Explain the various Instructional Design Principles.
- CO3:** Develop own course material and upload it using an appropriate LMS.
- CO4:** Evaluate and apply appropriate Assessment techniques to the E-content
- CO5:** Differentiate between Summative and Formative assessment.
- CO6:** Write Learning and Course objectives.

SYLLABUS

UNIT I: Introduction & Course Development **[20HRS]**

Scope and form of E-learning, Role of an E-learning project, Phases in an E-learning project. Instructional Design, The process of Designing Instruction, Developing Materials.(Story Boarding, Content Integration, and SCORM Compliance).Working with L.M.S. (Learning Management System)- Installation and use of the administrator, teacher and student interface. Course Definition, Registration and upload, tracking of results).

UNIT II: E-learning & Pedagogical Approaches **[15HRS]**

The Behaviorist School of learning and its implications on E-learning, The Cognitive School of Learning and its Implication on E-learning, The Constructivist School of Learning and its implications on E-learning. Blooms Taxonomy of Educational Objectives, Types of Learning Objectives. Content Analysis (Types- Facts, concepts, process, procedure, principles).The Teaching of concepts, procedure, principles, understanding. Enabling a motivated Learning Environment.

UNIT III: E-learning Strategies & Assessment Design
[10HRS]

E-LEARNING STRATEGIES:

Simulation, Drill, Interactive Learning, Problem Solving, Tutorials.

ASSESSMENT DESIGN:

Online formative and summative assessment, Rubrics for Assessment- Analytic and Holistic Rubrics, Rubrics for Assessment, Security and Authentication.

REFERENCES:

MANDATORY:

1.Shelly Cashman Gunter.(2011).Teachers Discovering Computers: Integrating Technology in the Classroom,(7th ed.).Wadsworth Publishing Co Inc.

SUPPLEMENTARY:

1.Smith, P. L. & Ragan, T. J.(2008). Instructional design(4rth ed.). New York: John Wiley & Sons. ISBN:0471393533

2.M.D. Roblyer, Aaron H. Doering(2018). Integrating Educational Technology into Teaching: Student Value Edition (8th ed.). Publisher: Pearson ISBN-10: 013289680X, ISBN-13:978-0132896801.

3.Dick, W., Carey, L., & Carey, J. O.(2014). The systematic design of instruction (8th ed.). Boston: Allyn and Bacon.

4.Wiggins, G. P., & McTighe, J.(2005). Understanding by design (2nd ed.). Assn. for Supervision & Curriculum Development;

5.Alexandria, VA: Association for Supervision and Curriculum Development.

6.Christensen, C. M., Horn, M. B., & Johnson, C. W.(2016). Disrupting class: How disruptive innovation will change the way the world learns(2nd ed.). New York: McGraw- Hill.

WEB BASED:

1.<https://www.udemy.com/course/instructional-design-for-elearning/>

2.<https://nptel.ac.in/courses/127101013/>

3. <https://nptel.ac.in/courses/121105010/>

4. Better learning (Bloom's Taxonomy): <https://www.plesyoutube.com/watchv=0flnAoX9QEw>

5.Assessment:https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/121106012/lec13.pdf

Practicals: E-Learning

Credit: 01

Marks: 25

Duration: 30 Hrs

List of suggested **PRACTICALS** using any Multimedia Software (the numbers in brackets indicate number of practicals):

- | | |
|--|-------------|
| (1) Installing, Creating and Running a complete course using LMS
Course Administration: Creation and using Resources and Planning Activities
Case Study: Create a complete course and work on all the resources and activities. Also the various grade book options etc. | [3P] |
| (2) Creating Storyboards (using Movie Maker/PPT or similar FOSS) | [1P] |
| (3) Construct a Mindmap (using Freemind or any other FOSS) | [1P] |

- (4) Prepare a 10-minute Video tutorial on some system (e.g. how to search for free images in Google) using screen cast. Example tool that can be used: screencast-o-matic). [2P]
- (5) Study a virtual world system like Whyville, and make a 10 slide presentation (using PPT or FOSS on it). [2P]
- (6) Create a fully tagged 10-question QB on a topic and load onto Moodle. [2P]
- (7) Build a course using WISE [2P]
- (8) Design Rubrics (for a given scenario) [2P]

Course Title: Human Computer Interface

Course Code: DCA-EL4

Marks: 75

Credits: 3

Duration: 45 Hours

Prerequisite Courses: Nil

Course Objectives:

- To study the different aspects of human computer interaction and the computer interface design concepts.

Course Outcomes:

At the end of the course students will be able to:

C01: Understand the intricacies of human interaction with a computer System.

C02: Understand the principles of good screen design and layouts and requirements.

C03: Understand the different navigation schemes on windows-based interface; learn the different types of selection devices and components of a window-based interface.

C04: Classify human users based on their abilities, personalities.

C05: Designing prototypes. Evaluate the design of user interfaces. Compare the interfaces different products.

SYLLABUS:

UNIT I:

[10 HRS]

Introduction to Human Computer Interaction

Human-Computer Interaction, Evaluating Designs, The Birth of HCI. Importance of user Interface, Importance of good design, Benefits of good design, principles & heuristics of good design.

Importance of: Human characteristics, Human consideration, Human interaction speeds, Understanding business functions. User centered design- Need-finding: Participant Observation, Interviewing, Additional Need finding, contextual inquiry & persona.

[20 HRS]

Rapid Prototyping and Graphical Interface Design

Rapid Prototyping: Story boarding. Paper Prototyping and Mockup, Video Prototyping, Creating and Comparing Alternatives.

Direct Manipulation. Mental Models. Heuristics (guidelines) for design.

Graphical Interface Design: Graphical user interface, standards such as Microsoft windows HCI guidelines, Windows: Navigation schemes selection of window; Selection of devices based and screen-based controls, Components, Text and messages, Icons, Multimedia, Colors., controls, help & error messages design.

UNIT III:**[15 HRS]**

Heuristic Evaluation and Visualization

Web user interface design – Jessy James Garette five layers of user experience.

Heuristic Evaluation: Heuristic Evaluation – Why and How?

Visualization, Amount of information, Focus and emphasis, Presentation information simply and meaningfully, Information retrieval on web, Statistical graphics.

REFERENCES:**MANDATORY:**1. Alan.C, Robert.R. About Face 2.0: The Essentials of Interaction Design, Wiley(3rd ed.). Wiley.2. Alan.D, Janet.F, Gregory D. and Russell,B. Human-Computer Interaction,(3rd ed.). Prentice Hall.

Supplementary:

1. Ben.S,Catherine.P. Designing the User Interface: Strategies for Effective Human-Computer Interaction(5th ed.). Pearson.2. Donald.A.N. The Design of Everyday Things (3rd ed.). Basic Books.**WEB BASED:**1.<http://hcibib.org/>2.https://www.tutorialspoint.com/human_computer_interface/index.htm3.https://www.academia.edu/4955516/Wiley_The_Essential_Guide_to_User_Interface_Design_3rd_Edition_Apr_2007?auto=download4.https://www.slideshare.net/busaco/hci-2015-110-humancomputer-interaction-overview?qid=1c116f30-ec87-4eb4-a375-49b2bbe65d75&v=&b=&from_search=2**Practicals: Human Computer Interface****Credit: 1****Marks: 25****Duration: 30 Hours**

Suggested list of practical (Numbers in brackets indicate number of practical's)

1. Paper Prototyping using templates (1P)
2. Conducting survey interview and summarizing the result (1P)
3. Persona- conducting contextual interview and developing persona (1P)
4. GUI design- form design, menu design, help, error messages (2P)
5. Web UI design- pages, navigation, controls, Page submission – Asynchronous (2P)
6. Report designs (2P)
7. Visualization and info graphics (1P)
8. Heuristic evaluation (2P)
9. Story boarding (1P)

Course Title: E-Commerce

Course Code: DCA-EL5

Marks: 75

Credits: 3

Duration: 45Hrs

Prerequisites: Nil

Course Objectives:

- To learn the working of E-Commerce website and the various background processes involved to study the activities associated with e-commerce like buying, selling and payment, understand the various technologies used in e-commerce websites and security mechanisms involved in e-commerce websites.

Course Outcomes:

On completion of this course the student will be able to:

- CO1:** Explain the various E-Commerce Strategies.
- CO2:** Explain the working of an E-Commerce Website.
- CO3:** Evaluate the various Payment Mechanisms.
- CO4:** Develop an E-Commerce Website.
- CO5:** Create an online store.
- CO6:** Recognize and discuss global E-commerce issues
- CO7:** Analyze the impact of E-commerce on business models.

UNIT I: Introduction to Electronic Commerce, Value Chain, Business Strategy & Electronic Data Interchange [10HRS]

The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, Electronic Commerce in Perspective.

The Value Chain: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains Competitive Advantage, Porter's Model, First Mover Advantage, Sustainable Competitive, Competitive Advantage using e-commerce

Business Strategy:

Michael Porter's 5 force, analysis. EDI: EDI Definition, EDI Technology, EDI Standards, EDI Communications.

Unit 2: Electronic payment systems & E-business [20HRS]

Overview of the electronic payment technology; limitations of traditional payment instruments; Electronic or Digital Cash-Properties of Electronic Cash, Digital Cash in action; Electronic Checks-benefits of electronic checks, electronic checks in action, Net Check: A Prototype Electronic

Check System; Online Credit Card-Based Systems- types of credit card payments, Secure Electronic Transactions (SET); Other Emerging Financial Instruments: POS (Point of Sale), E-Cash, Net Banking, Credit/Debit Cards and Electronic Benefits and Security Issues; Case Studies of the various modes of electronic payment of various types of websites.

E-business: EDI Application in business, E-Commerce Law, Forms of Agreement, Govt. policies and Agenda;

Case Study of Internet bookshops, Grocery supplies, software supplies and support, electronic newspapers,

Internet banking, Virtual auctions, online, shared dealing; Business to Legal issues: Risks involved; Paper

Document vs. Electronic document, Authentication of Electronic document, Laws, Legal issues for Internet Commerce: Trademarks and Domain names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract.

UNIT III: Firewalls and Transaction Security & M-Commerce

[15HRS]

Firewalls and Network Security: Types of firewalls, Firewall Security Policies, Emerging Firewall Management Issues; Transaction Security: Types of Online Transactions, Requirements for Transaction Security; Encryption and Transaction Security: Secret-Key encryption, Public-Key Encryption, Implementation and Management Issues; Digital Certificate; Security Threats to E-Commerce, Virtual Organization, Business Transactions on Web, E-Governance and EDI. CONSUMER E-COMMERCE: Consumer trade transaction, Internet, Page on the Web, M-COMMERCE: Basic concept and applications, difference with E-Commerce, benefits of integration with ERPs.

REFERENCES:

MANDATORY:

1. David Whiteley. (2014). E-Commerce Strategy Technologies and Applications. Tata McGraw Hill

SUPPLEMENTARY:

1. Ravi Kalakota and Andrew B. Whinston. (2014). Electronic Commerce A Manager's Guide. Pearson Education.

2. Kamlesh K Bajaj and Debjani Nag. (2005). E-Commerce The Cutting Edge of Business (2nd ed.). Tata McGraw Hill

WEB BASED:

1) <https://nptel.ac.in/content/storage2/courses/106108103/pdf/PPTs/mod13.pdf>

2) <http://assets.vmo.ac.in/MCA23.pdf>

3) https://www.tutorialspoint.com/e_commerce/e_commerce_tutorial.pdf

4) <http://164.100.133.129:81/econtent/Uploads/Session%206%20-%20e-Business%20and%20e-commerce.pdf>

5) https://www.tutorialspoint.com/mobile_marketing/m_commerce.htm

6) https://www.tutorialspoint.com/internet_technologies/firewall_security.htm

Practicals: E-COMMERCE

Credit: 01
Marks: 25
Duration: 30 Hrs

List of suggested practical's(the numbers in brackets indicate number of practical's):

ECOMMERCE PLATFORMS: (10P)

WORDPRESS: Primarily designed for creating blogs but can be used to create online store by adding appropriate themes & plugins. Basic Programming Knowledge in PHP may be required in later stages. (<http://www.wordpress.com>).

WIX:Wix is a drag & drop website builder which can also be used to build an ecommerce website without any programming experience. (<http://www.wix.com>).

SHOPIFY: Made specially to create online stores, add products, categories & handle payments all without Any Programming knowledge required. (<http://www.shopify.com>).

BLOGGER : Similar to WordPress but a blogging service provided by google which again can be customized to create an online store. (<http://www.blogger.com>).

TOOLS USED TO FACILITATE ECOMMERCE (5P)

GOOGLE ANAYLITICS: Present in most ecommerce platforms and can be integrated in almost any application, giving the owner insights of the customer base visiting the website. Can also be fine-tuned to give more detailed analysis like how many visits actually got converted into leads etc. (<https://www.google.co.in/analytics>).

MAIL CHIMP: A service to send emails to customers. Useful in marketing. (<http://www.mailchimp.com>).

ZENDESK :Zendesk is used to setup a support centre for your application users . Users can open a ticket and get their issues resolved. Useful in issue tracking and management. (<https://www.zendesk.com/>).

APPOINTLET : A Service integrated with google calendar and helps manage all appointments. Useful in applications where an appointment is required. (<https://www.appointlet.com/>).

UNBOUNCE :Used to create landing pages for an application . A good landing page sometimes defines whether a user will visit the site or turn away. (<http://www.unbounce.com/>).

Course Title: Digital Marketing

Course Code: DCA-EL6

Marks: 75

Credits: 3

Duration: 45 Hours

Prerequisite Course: Client Side Technologies

Course Objectives:

- To build Optimized and Accessible Websites for the Search Engines.
- To study various online Marketing Strategies.
- Analyze and research Internet to improve the quality and marketability of the Websites.

Course Outcomes:

At the end of the course students will be able to:

C01: Optimize the website for various search engines.

C02: Market the products/services/facilities using Search Engine.

C03: Market the products/services/facilities using Social Media.

C04: Market the products/services/facilities using Email.

C05: Analyze the Web for improving the marketing strategy.

C06: Understand the concept of Marketing Automation.

C07: Use various software tools to implement Digital Marketing.

UNIT 1: Search Engine Optimisation and Marketing (SEO & SEM)

[15 HRS]

SEO: Introduction to Online Search; Function of Search Engines Google Page Rank; Introduction to Search Engine Optimisation; Building Accessible Site; Keyword Research and Optimisation; Link Building Strategies; Useful Tools for SEO; The Past, Present and Future of SEO.

SEM: Introduction to Internet and Search Engine Marketing; Google Adwords; Adwords Account Structure; Navigating in Google Adwords; Working with Keywords; Creating Ads in Google Adwords;

Creating and Managing your First Ad Campaign; Adwords Reporting and Account Performance Reports.

UNIT 2: Social Media and Email Marketing (SMM & EM)

[15 HRS]

SMM: Introduction to the World of SMM; Why Social Media?; Getting Started with Social Media; Building Relationships via Facebook, Twitter, LinkedIn, YouTube; Handling Positive and Negative Comments; Social Media Content Base Creation.

EM: Importance of Email marketing; Email Marketing Software's; Subscriber List; Email Marketing Campaign; Newsletters; Measuring the results.

UNIT 3: WEB Analytics and Marketing Automation

[15 HRS]

Web Analytics and Intelligence Tools; Basic Metrics Demystified; Introduction to Google Analytics; Goals and Actionable Insights; Data Management; Social Media Analytics; Social Media Goals and KPI's; Tools for Social Media Analytics.

Marketing Automation: Introduction to Marketing Automation; Advantages of using Marketing Automation Software; Issues with Marketing Automation.

REFERENCES:

MANDATORY:

1. Damian Ryan, (2014), Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, (3rd ed.), Kogan Page Publisher.

SUPPLEMENTARY:

1. Calvin Jones and Damian Ryan, (2013), The Best Digital Marketing Campaigns in the World, (1st ed.), Kogan Page Publications.
2. Nick Smith, (2013), Successful SEO and Search Marketing in a Week, (1st ed.), Teach Yourself Publisher.
3. Lee Odden, (2012), Optimize: How to Attract and Engage More Customers by Integrating SEO, Social Media, and Content Marketing, (1st ed.), Wiley Publishing.
4. Avinash Kaushik, (2013), Web Analytics 2.0: The Art of Online Accountability & Science of Customer Centricity (Sybex), (2nd ed.), Wiley Publishing.

WEB BASED:

https://www.tutorialspoint.com/digital_marketing/index.htm

www.iab.net/resources/ad_revenue.asp

www.searchenginestrategies.com/sew/winter06/index.html

<https://developers.google.com/products/>

www.freewebsubmission.com

<https://www.semrush.com/analytics/seomagic/lists>

<https://neilpatel.com/ubersuggest/>

<https://adwords.google.com/home>

<https://hootsuite.com/>

www.googleanalytics.com

Practicals: Digital Marketing

Credit: 1

Marks: 25

Duration: 30 Hours

1. Using Search Engine Optimization tools (like google & bing search console, hubspot, webceo, google page speed) (3P)
2. Using Search Engine Marketing tools (like google adwords, google adwords certifications, search, display, remarketing formats, facebook marketing, linkedin advertising) (2P)
3. Using Social Media Marketing tools (like hootsuite, buffer, sproutsocial, klear, twitonomy, socialmention, google alerts, mention) (2P)
4. Using Email Marketing tools (like mailchimp, campaign monitor, mailgun, mandrill, phplist, amazon ses) (1P)
5. Using Web Analytics tools (like google analytics, compete.com, crazyegg, facebook insights, twitter insights) (2P)

Course Title: Network Administration
Course Code: DCA-EL7
Marks: 75
Credits: 3
Duration: 45Hrs

Prerequisite Courses:Nil

Course Objective:

- To be able to understand the working principles of network and setting up of network.
- Configuring network and administration of network.

Course outcomes:

At the end of the course students will be able to :

CO1:Understand the basic working of reference model of communication to provide end to end services for the various applications.

CO2:Analyse the various behaviour of network protocols using the networking tools.

CO3:Understand the basics of IP.

CO4:Design the basic computer network and maintain the network.

CO5: Create and manage users and groups.

CO6: Configure routers and basic network application.

SYLLABUS:

UNIT I. Introduction:

[15HRS]

Basics of TCP/IP, IP address (IPv4 and IPv6), Internet Architecture, peer to peer and client server networks, subnetting, supernetting, and basic Network commands.

UNIT II. Administration & Routing:

[15HRS]

Administration - Managing users and Groups, adding/removing software/hard ware, display settings, folder

options, setting up mail client, Device manager, Resource sharing. Basic Data recovery concepts: Disk repair tools, recovering files and directories, correcting errors reported by Scandisk.

Routing - Overview of routing, static and dynamic routing, adding and deleting static routes, routing protocols, RIP, OSPF and IGP.

UNIT III. Application Layer, VLAN & Firewall:

[15HRS]

Application - DHCP (Dynamic host control protocol): Overview of DHCP, DHCP protocol, features of DHCP, Monitoring and troubleshooting, using DHCP in non routed and routed network. DNS (Domain Name Service): Overview of DNS protocol, DNS name space, Zone of authority and name resolutions, features of DNS server, Reverse lookup, Placement of DNS server, Installation and Configuring of DNS server and client.

WWW: Architectural overview: server side and client side technology. Mail server: Electronic mail, architecture and services, user agent, message transfer, Final delivery

VLAN - Introduction, basics of VLAN, uses of LANs, working principle, types of VLANs, frame processing

Firewall - Overview of firewall, types of firewall, working principles of firewall, filters.

REFERENCES:

1. Craig Hunt, "TCP/IP Network Administration", O'Reilly; 3rd edition, 2002

SUPPLEMENTARY:

1. Man pages of linux

2. Andrew S. Tanenbaum, Computer Networks, Prentice Hall of India, 4th Edition, 2002.

WEB BASED:

1. <https://support.microsoft.com/en-in/help/15089/windows-change-tcp-ip-settings>

2. TCP/IP Guide, Charles M. Kozierok, Available Online - <http://www.tcpiiguide.com/>

3. <https://www.tutorialspoint.com/The-TCP-IP-Reference-Model>

4. <https://www.computernetworkingnotes.com/rhce-study-guide/how-to-configure-dns-server-in-linux.html>

5. <https://www.geeksforgeeks.org/virtual-lan-vlan/>

Practicals: Network Administration

Credit: 1

Marks: 25

Duration: 30 Hours

A Mini Project [incorporate at least 6 below features] / [ANY 6 practical's]

1. Managing users: creating/Deleting groups, users, setting passwords, setting permissions to groups and users, Device Manager[2p]
2. Setting up client server network[2P]
3. Configuring Telnet and ftp server
4. Remote desktop connection
5. Router configuration.
6. DHCP Server Configuration
7. Web Server Installation
8. DNS server Configuration
9. VLAN configuration
10. FIREWALL

Course Title: Software Testing
Course Code: DCA-EL8
Marks: 75
Credits: 3
Duration:45 Hrs.

Prerequisite courses: Introduction to Programming

Course Objectives:

- To understand the fundamental concepts in software testing
- To study the various software testing strategies
- To learn how to design test cases and execute them.

Course Outcomes:

At the end of the course students will be able to :

CO1 : Understand the different software testing strategies.

CO2 : Apply testing strategies to live projects.

CO3 : Design test cases

CO4: Execute test cases using software testing tools .

SYLLABUS:

UNIT I:

[15HRS]

Software testing principles - Software Testing- Need for testing, Psychology of testing, Testing economics, SDLC and Testing, Verification & Validation. Quality Assurance, Quality Control Testing strategies and types - White box testing techniques - Statement coverage, Branch Coverage, Condition coverage, Decision/Condition coverage , Multiple condition coverage, Dataflow coverage, Automated code coverage analysis, Inspections, Walk throughs Code Review Black box testing techniques - Boundary value analysis, Robustness testing, Equivalence partitioning, Syntax testing, Finite state testing, Levels of testing, Unit, Integration and System Testing, Compatibility Testing, Domain Testing, Adhoc Testing ,Use of Requirement, Traceability Matrix.

UNIT II:

[20HRS]

Integration Testing Waterfall - Top-down ,Bottom up ,Big bang, Sandwich System and Performance Testing - Types of system testing ,Functional and non-functional testing Acceptance Testing ,Setting entry and exit criteria for phases and typical product releasescenarios ,Basic factors governing performance testing, Methodology for performance testing, Tools for performance testing.

Regression Testing - Purpose ,Timing, Choice of tests ,Smoke tests ,Best practices
Internationalization and Localization testing - Preliminary concepts,Adhoc testing,Pair testing,Extreme testing, Agile testing,Exploratory testing,Defect seeding.Usability Testing - Factors in usability testing, Aesthetic testing,Accessibility testing ,Tools for usability testing.

Testing object oriented software - Definitions and Challenge differences from testing non-OO Software, Class testing strategies Class Modality, State-based Testing, Message Sequence Specification.

UNIT III:

[10HRS]

People and organizational issues in testing - Common people issues and myths in testing,Providing career paths in testing, Organizational structures for testing teams, Geographically distributed testing teams and success factors. Test Management and Automation-Test Planning,Test Management,Test Process,Test Reporting,Test Automation,Factors to consider in automation, Challenges in test automation, Test Metrics, Product Metrics, Process Metrics,Progress Metrics. Use of metrics in ascertaining product release.

REFERENCES:

MANDATORY:

1. Srinivasan D. ,Gopalaswamy R.:(2009)Software Testing- Principles and Practices , 4th Edition:
Pearson Publication

SUPPLEMENTARY:

1. Jalote P., (2010)An Integrated Approach to Software Engineering, 3rd Edition :Narosa Publishing House
2. Pressman R., (2017) ,Software Engineering: A Practitioners Approach, 6th Edition:McGraw Hill Publication

WEB BASED:

1. <https://www.guru99.com>

Practicals: Software Testing

Credit: 01

Marks: 25

Duration: 30 Hours

1. Planning Test Cases
2. Generating Test Cases/Test Suite
3. Enhancing Tests
4. Debugging Tests
5. Running Tests
6. Analyzing Results

7.Reporting Defects

Course Title: Server Side Programming

Course Code: DCA-EL9

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Client Side Technologies

Course Objective:

- To give an understanding the web software development: how it is different, issues involved in it.

Course Outcomes:

At the end of the course students should be able to :

CO1 : Get hands-on programming experience using open -source software, PHP and MySQL to build professional-quality, database-driven websites.

CO2 : Develop the skills to build interactive web sites with authentication and security by integrating PHP with HTML and CSS.

CO3 : Apply basic and advanced object-oriented programming techniques, use libraries, frameworks and advanced database connectivity techniques, and integrate PHP with other web technologies to build secure e-commerce applications.

CO4 : Customize an application to meet the specific needs of a client use case as would be done in a real-world application.

SYLLABUS

UNIT I

[15 HRS]

Principles of OOP:

OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

Web Technologies:

Introduction to Web technology, Web pages and Browsing, Dynamic Web Pages, Java script, Dynamic web document technologies - PHP, JSP, ASP, Active web pages and Active Web technologies.

Tags, Escaping from HTML, Types:

Resources, NULL, Callbacks, Type juggling.

Variables:

Basics, Predefined variables and Scope, Constants: Syntax, Magic constants, Expressions.

UNIT II

[15 HRS]

Operators, Control structures, Functions, Predefined exceptions.

Security:

Introduction, General considerations, Installed as CGI binary, Installed as an Apache module, File system Security, Database Security, Error Reporting, Using Register Globals, User Submitted Data, Hiding PHP.

UNIT III

[15 HRS]

Features:

HTTP authentication with PHP, Cookies, Sessions, Handling file uploads, Connection handling, Persistent Database Connections, DTrace Dynamic Tracing.

Ajax :

Request objects creation, forwarding the request, accepting response object and display on webpage.

REFERENCES:

MANDATORY:

1. Steven Holzner, -PHP: The Complete Reference||, Tata Mcgraw Hill
2. Timothy Boronczyk, Martin E. Psinas, -PHP and MYSQL: Create - Modify – Reuse||, Wiley India Private Limited
3. Tim Converse, -PHP 5 and MySQL Bible||, Wiley India Private Limited
4. Meloni J.C., -Teach yourself PHP, MySQL and Apache all in one||, Pearson Education
5. Stephen J. Schrader, -AJAX||, imported edition.

WEB BASED:

1. <http://in1.php.net/manual/en/index.php> for PHP v 5.5 and above
2. <https://www.w3schools.com/php/>
3. <https://www.tutorialspoint.com/php/index.htm>
4. <https://www.javatpoint.com/php-tutorial>
5. <https://www.phptpoint.com/php-tutorial/>
6. <https://www.guru99.com/php-tutorials.html>
7. <https://www.geeksforgeeks.org/php/>

Practicals : Server Side Programming

Credit : 1

Marks : 25

Duration: 30 Hours

Suggested list of practical (Numbers in brackets indicate number of practical's)

1. Creating dynamic web pages with PHP (3P)
2. Authentication, Cookies, Session management (1 P)
3. Error handling (1 P)
4. Database connectivity (3 P)
5. Using framework like CodeIgniter (1 P)
6. Ajax implementation (1 P)
7. File uploading (1 P)
8. Uploading and images to and from server (1 P)

Course Title : Data Structures
Course Code : DCA-EL10
Marks : 75
Credits: 3
Duration:45 Hrs.

Prerequisite Courses: Problem Solving and Introduction to Programming

Course Objectives:

- To understand different methods of organizing data and efficiently implement different data structures.

Course outcome:

At the end of the course students will be able to :

- CO1 :** Define relevant standard algorithms for various data structures. Learn various applications of data structures.
- CO2 :** Implementation of data structures.
- CO3 :** Use various data structures for sorting and searching.
- CO4 :** Analyze and compare algorithms for efficiency using Big-O notation.
- CO5 :** Formulate new solutions for programming problems.

SYLLABUS:

UNIT I

[15HRS]

Introduction to data structures:

Concept, Data type, Data object, ADT, Need of Data Structure, Types of Data Structure.

Algorithm analysis:

Algorithm – definition, characteristics, Space complexity, time complexity, Asymptotic notation (Big O).

Linked List:

Introduction to List, Implementation of List – static & dynamic representation, Types of Linked List, Operations on List, Applications of Linked List, polynomial manipulation, Generalized linked list – concept & representation.

Stacks:

Introduction, Representation-static & dynamic, Operations

UNIT II

[15HRS]

Stack Applications :

Application - infix to postfix & prefix, postfix evaluation, Simulating recursion using stack.

Queues:

Introduction, Representation -static & dynamic, Operations, Circular queue, priority queue (with implementation), Concept of doubly ended queue.

Trees:

Concept & Terminologies, Binary tree, binary search tree, Representation – static & dynamic, Operations

on BST – create, Insert, delete, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes, non recursive in order traversal, Expression Tree. Introduction to AVL Trees.

UNIT III

[15HRS]

M-Way Search Trees : Introduction, B Tree, B+ Tree.

Searching and Sorting :

Use of various data structures for searching and sorting, selection sort, merge sort, quick sort, heap sort and hashing.

Graph :

Concept & terminologies, Graph Representation – Adjacency matrix, adjacency list, Traversals – BFS & DFS, Application of BFS, DFS – Shortest path, Backtracking.

REFERENCES:

MANDATORY:

1.Data Structures and Algorithms in Python Roberto Tamassia, Michael H. Goldwasser Michael T. Goodrich, Wiley Student Edition

SUPPLEMENTARY:

1. Horowitz Ellis, Sahni Sartaj, Fundamentals of Data Structures in C, University Press, 2nd Edition, 2008.

2 . Michael T. Goodrich, Roberto Tamassia , Data Structures and algorithms in Java, John Wiley & sons inc.,5th Edition,International Student version.

3. Langsam Yedidyah, Augenstein J. Moshe, Tenenbaum M. Aaron , Data Structures using C and C++, Pearson Education, Second Edition ,2009

4. Gilbeg Richard, Forouzan Behrouz, Data Structures: A Pseudocode Approach with C++, Cengage Learning, Second Edition

WEB BASED:

1.https://www.tutorialspoint.com/python_data_structure/python_data_structure_introduction.htm

2. <https://runestone.academy/runestone/books/published/pythonds/index.html>

3. <https://www.w3schools.in/data-structures-tutorial>

4. <https://www.datacamp.com/community/tutorials/data-structures-python>

5.<https://www.programiz.com/dsa>

6. <https://www.geeksforgeeks.org/data-structures/>
7. <https://www.javatpoint.com/data-structure-tutorial>

Practical: Data Structures

Credit: 1

Marks: 25

Duration: 30 Hours

Programs using a Programming Language that covers the following concepts:

1.Stack: Static/Dynamic stack implementation.

2.Stack: infix to postfix.

Stack: Evaluation of Postfix expression.

3.Queues: Static and Dynamic Queue
Implementation

Queues: Circular queue

4.List: Singly Linked List,

5.List: Doubly Linked List

6.List: Circular Linked List

7.Linked List: Polynomial addition

8.Trees: Binary Search Tree: create, add, delete, display nodes.

9.Trees: BST traversal.

10.Graph: Representation of Graphs, Graph

Traversals.

Graph: DFS, BFS.

Course Title: Office Automation Tools

Course Code: DCA-EL13

Marks: 75

Credits: 3

Duration: 45 Hrs

Course Prerequisites: Nil

Course Objectives:

- To explore the features of a few automation tools used in office work.
- Study and implement the features of spreadsheets, LATEX and Image/Graphic design tools.

Course Outcomes:

At the end of the course students will be able to:

CO1: Understand basic Spreadsheet features.

CO2: Work with different worksheets.

CO3: Analyze the data using various graphs.

CO4: Analyze data using various spreadsheet features such as lookup tables, Pivot tables, and other statistical features.

CO5: Use different features of DTP software.

CO6: Develop a desktop Publishing Application using given software.

SYLLABUS:

UNIT I: Spreadsheets:

[15HRS]

Spread Sheet & its Applications, Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data filling. Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row.

Mathematical operations: (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets- Labeling columns & rows, Formatting- Cell, row, column & Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Using Tools – Error checking, Spell Checks, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

UNIT II: Presentation Software and ADOBE InDesign [15HRS]

Introduction & area of use; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & it's different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options.

Adobe InDesign: Introduction, Introducing the Workspace, Getting to Know InDesign, setting up a Document and Working with Pages; Learning all the primary Tools: Working with Frames, Importing and linking Graphics, introduction to masterpages, Importing and Editing text, Working with typography; Constructing a publication: setting up pages, using master pages, creating and adjusting layouts for newspapers, brochures etc., numbering pages.

UNIT III: Corel Draw: - Graphic design: -

[15HRS]

Introduction: Introduction to Corel Draw, Features of Corel Draw Corel Draw Interface, learning about Raster and Vector Graphics.

Basic Drawing Skills: Selecting and Manipulating Objects, Drawing and Shaping Objects, Arranging Objects, learning about raster and vector graphics.

Mastering Different Tools: Using Text and Color, Working with Color Palette, Text Special Text Effects, align and distribute, transformation tools, Shaping etc.

Applying Special Effects: Learning Blending options, Distortion, Contour Effects, Envelope effect, Transparency Power Clip.

Working with Images: Working with images, applying special effects, editing bitmap.

Saving, Exporting and printing: Different Saving options, exporting your designs into different formats for printing, Creating layouts and finalizing content for printing.

REFERENCES:

MANDATORY:

1. Mark Moore, (2015), Mastering Excel: Building Dashboards, (1stEd.), CreateSpace Independent Publishing Platform
2. R. Shamms, Mortier & Rick Wallacl (1997), PageMaker-Complete, (Ed.) Techmedia
3. Dinesh Maidasani, (2008), Straight to the Point – MS Office 2003, (1stEd.), Firewall Publications

SUPPLEMENTARY:

1. Ramesh Bangia, (2017), Learning PageMaker 7, (Ed), Khanna Book Publishing Co Pvt Ltd.
2. Michael S. Toot, (2017), Master Visually Microsoft Office 2003, (Ed), Visual Publishers.

3. Mansfield, (2017), Mastering WORD 6 for Windows, (Ed), BPB
4. Townsend, (2017), Mastering EXCEL 4 for Windows, (Ed), BPB

WEB BASED:

1. <https://www.guru99.com/excel-tutorials.html>
2. <https://learn.corel.com/tutorials/how-to-use-the-objects-docker-in-coreldraw/>
3. https://www.tutorialspoint.com/adobe_indesign_cc/index.htm
4. <https://www.coreldraw.com/en/pages/tutorials/?topNav=en>
5. <https://www.latex-tutorial.com/tutorials/>
6. <https://www.youtube.com/watch?v=SoDv0qhyysQ> – Latex tutorials

Practicals : Office Automation Tools

Credit : 01

Marks: 25

Duration: 30 Hours

List of practical (Any Ten):

PART-I

(6P)

1. Using formulas and functions:

To prepare a Worksheet showing the monthly sales of a company in different branch, offices (Showing Total Sales, Average Sales). Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student).

2. Operating on the sheets:

Finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.

3. Creating a Chart:

To create a chart for comparing the monthly sales of a company in different branch offices.

4. Using the data consolidate command:

To use the data consolidate command to calculate the total amount budgeted for all departments (wages, travel and entertainment, office supplies and so on) or to calculate the average amount budgeted for – say, department office expenses.

5. Sorting Data, Filtering Data and creation of Pivot tables.
6. Working on presentation (any open source presentation software such as impress or equivalent).

PART-II

CorelDraw/Page Maker

(9P)

1. Introduction
2. Basic Drawing Skills
3. Using Text and Color
4. Working with Objects
5. Adding special effects
6. Creating output
7. Layout and layers
8. Styles and templates
9. Advanced Effects.

Course Title: : Assessment and Evaluation for Learning

Course Code: DCA-EL14

Marks: 75

Credits: 3

Duration: 45 Hours

Prerequisite Courses: Nil

Course Objectives:

➤ To make students aware of importance of evaluation. They will know how to design effective evaluation methods.

Course Outcomes:

At the end of the course students will be able to:

CO1: Understand the process of evaluation.

CO2: Develop the skill in preparing, administering and interpreting the achievement test.

CO3: Understand and use different techniques and tools of evaluation for learning.

CO4: Comprehend the process of assessment for learning

CO5: Develop skills necessary to compute basic statistical measures to assess the learning.

SYLLABUS:

UNIT I: Process of Evaluation

[15 HRS]

Measurement, Assessment and Evaluation in Education – Concept & Relationship.

Taxonomy of instructional objectives (Revised Blooms Taxonomy and R.H. Dave) and its importance.

Principles of Evaluation.

Educational objectives and learning outcomes.

Criteria for selection of a good learning experiences and Types.

Relationship between educational objectives, learning experiences, content and evaluation.

UNIT II: Tools and Techniques of Evaluation

[15 HRS]

Characteristics of measuring tools: Validity, Reliability, Objectivity, Usability, Adequacy and Discrimination Power (Concepts and Factors Affecting them).

Evaluation Techniques and Tools:

a) Observation Technique: Rating Scale and Check List

b) Self Reporting Technique: Interview and Questionnaire

c) Projective Technique: Thematic Apperception Test (TAT) and Sentence Completion Test

d) Sociometric Technique: Sociogram and Guess Who?

Quantitative Tools of Evaluation

a) Construction of achievement test with special reference to Content area, Objectives and Types of Questions (Blue Print).

b) Diagnostic Test.

c) Performance Test: Jigsaw and Puzzle.

d) Oral Test and Practical Test.

UNIT III : Assessment for Learning & Interpreting Test Scores

[15 HRS]

Significance of assessment for learning: Self assessment and peer assessment

Records used in Assessment:

- a) Profiles: Meaning, Steps involved and criteria for developing and maintaining a comprehensive learner profile.
- b) Evaluation rubric: Meaning , Construction and Uses.
- c) Cumulative records : Meaning, Significance.

Ethical Principles of Assessment:Examination Reforms

- a. Continuous and Comprehensive Evaluation (CCE).
- b. Choice Based Credit System (CBCS).
- c. Open Book Examination.

Feedback in Assessment

- a) Importance of Feedback in learning.
- b) Types of Feedback : Constructive feedback, Oral and Written,Individual & Group.

Statistical measures to interpret the test scores (Meaning, Characteristics, and Uses: Concepts only).

Measures of Central Tendency : Mean, Median, Mode.

Measures of Variability : Quartile Deviation, Standard Deviation.

Percentile and Percentile Rank.

Co-efficient of correlation by Spearman's Rank Difference method.

Standard Scores: Z and T (Concept Only).

Graphical representation of data

REFERENCES:

MANDATORY:

- 1.Assessment and Evaluation for Learning Dandekar, W.N. (2007).Evaluation in Schools,Pune: Shreevidya Aprakashan.
- 2.Measurement evaluation and assessment in education paperback – 2016 By [Bipin Asthana](#)(author).

SUPPLEMENTARY:

- 1.Garrett, H.E. (2008). Statistics in Psychology and Education. Delhi: Surjeet Publication.
- 2.Patel, R.N. (2011). Educational Evaluation Theory and Practice. Mumbai: Himalaya Publishing House Pvt. Ltd.
- 3.Rani, P. (2004).Educational Measurement and Evaluation. New Delhi: Discovery Publishers.

Practicals: Assessment and Evaluation for Learning

Credit: 1

Marks: 25

Duration: 30 Hours

1. Developing an achievement test with its Blue Print
2. Developing an achievement test with its Answer Key and Marks Distribution.
3. Developing an achievement test with its Blue Print, Answer Key and Marks Distribution.
4. Developing a Portfolio
5. Developing a Profile
6. Developing a Portfolio & Profile

7. Preparation of an Evaluation Rubric
8. Preparation of an Evaluation Rubric
9. Designing Questionnaire & Interview Schedule on a given topic
10. Designing Questionnaire & Interview Schedule on a given topic
11. Evaluation of available Unit test and reformation of the same.
12. Evaluation of available Unit test and reformation of the same.
13. Preparing any four evaluation tools for Formative Assessment.
14. Interpreting Test Scores (Data entry and calculation via spreadsheets)
15. Interpreting Test Scores (Visual)

Course Title: : Instructional Design

Course Code: DCA-EL15

Marks:75

Credits:3

Duration: 45 Hours

Prerequisite Courses: Nil

Course Objectives:

- Provides the basic knowledge and application of the skills and techniques required for the process of addressing learning settings.
- Focus on instructional systems design and instructional strategies at the curricular and the classroom level.
- Provide the background and skills needed to prepare and use a wide range of effective instructional materials.
- Distinguish basic advantages and disadvantages of the main instructional media and materials.
- Provide practice to assure effective preparation and the use of instructional materials.

Course Outcomes:

At the end of the course students will be able to:

CO1:Provide rationales for using a systematic approach to instructional design.

CO2:Identify and summarize the steps and methods of the instructional design process.

CO3: Function independently and cooperatively in team work.

CO4:Compare and contrast various instructional design perspectives.

CO5: Demonstrate various instructional design competencies.

SYLLABUS:

UNIT I:

[15 HRS]

- Instructional and Material Design: Historical Perspective.
- Instructional Design: Meaning,
- Concept and Principle Instructional Design Process - steps
- System Approach to Instructional Design
- Theories on Instructional Design
- Information Processing
- Components of Instructional Design
- Instructional Objectives & Instructional Design,
- Learning and Teaching Styles in Instructional Design
- Instructional Method, Strategy and Models
- Modes of Instructional Design
- Computer Assisted Instruction
- Principles and Characteristics of Instructional and Material Design
- Learning Material Design : Designing and Development

- Designing e - Content and Materials

UNIT II:

[15 HRS]

- Learning Environment – Design.
- Content Structuring.
- Niceities of Language Writing & Writing Style.
- Writing Styles.
- Communication.
- Computer Mediated Communication.
- Hand - held Technologies.
- Communication tools for e – Learning.
- Class Management and Instructional Design.
- Assessment and Assessment Practices.
- Feedback and Instructional Design.
- Planning a Design.
- e - Learning and Instructional Design.
- Approaches and components of e – learning.
- Types of e - Learning : Synchronous and Asynchronous.

UNIT III:

[15 HRS]

- Pedagogical Design for e - Learning,
- Interactive e - Lesson & Interactive Multimedia in instructional design
- Models of Instructional Design,
- Design and development of Course or unit
- Teaching as Design: Historical Perspective,
- Interpreting teaching as Design,
- Pedagogical Design Capacity
- Instructional Design for Humanities and Science Teaching,
- Ethical issues in Instructional Design
- Teacher Vs Technology

REFERENCES:

MANDATORY:

1. [Instructional Design for elearning: Essential guide to creating successful elearning courses](#) (Marina Arshavskiy).
2. [ISD From the Ground Up: A No-Nonsense Approach to Instructional Design](#)(Chuck Hodell).

Practicals: Instructional Design

Credit: 1

Marks: 25

Duration: 30 Hours

1. Develop Professional & Organizational Profile

[2 P]

Information for the Professional Profile must be collected via face-to-face, email, or phone interview.

- Clearly describe the professional's educational background/path
- Clearly describe the professional's career path and experience
- Clearly describe the professional's current job description
- Detail the professional's individual and team duties and responsibilities
- Offer the professional's advice regarding a career in instructional design

Information for the Organizational Profile must be collected via face-to-face, email, or phone interview. The organization profile requires attending and/or participating in a meeting, conference, or workshop (live, via webcast, etc.).

- Clearly describe the organization's goal, purpose, and/or mission
- Clearly describe the organization's target audience
- Describe a typical meeting of the organization
- List any relevant publications and conferences
- Lists benefits of membership

2. Develop a Design Document

[5 P]

(The Design Document explains the approach and details the plan to developing a prototype of an instructional module. The purpose of this activity is to have students demonstrate the understanding of key concepts in instructional design and application to developing instructional modules).

3. Prototype Instructional Module

[6 P]

Develop a prototype of an instructional module from audience analysis to formative evaluation.

The student will apply the instructional design process (from audience analysis to formative evaluation) to the prototype. The team will design and develop the segment of the prototype based on information (regarding audience, content area, instructional approach, etc.) stated in the Design Document. Teams can use any appropriate medium (computer, paper, web, video, audio, etc.) to construct and deliver the prototype.

4. Conduct Peer Reviews

[2 P]

Each student will be asked to provide constructive, evaluative feedback to other groups at specific points in the instructional design process as dictated by the class schedule each of the following assignments: instructional goal, needs assessment plan, objectives, instructional approach, and evaluation plan.

Course Title: Content Management System

Course Code:DCA-EL16

Marks: 75

Credits: 3

Course Prerequisite: Nil

Course Objectives:

1. Use and manage different content management system.
2. Design and deploy websites developed using a content management system.

Course Outcomes:

On successful completion of this Course students will be able to:

CO1: Install and maintain content management systems.

CO2: Develop website using different content management systems.

CO3: Make use of plugins to add more functionality.

CO4: Create users and manage them.

UNIT I:

[15 HRS]

Wordpress

WordPress dashboard, Types of users, WordPress settings panel, Permalinks and RSS feeds,

Creating and managing posts, Setting up post categories, Creating and managing pages, Managing

comments, Installing and updating plugins, Customising WordPress themes, WordPress theme

options, WordPress Security / backup / domain transfers, Migration From Different Platforms,

Optimization of WordPress Website, SEO Plugin.

Woocommerce

Introduction to Woocommerce, Woocommerce installation, Creating product: Creating your product

- General data, Inventory data, Shipping data, Attributes, Advanced data, Grouped products, Virtual

products, Downloadable products, External/Affiliate products, Setting up categories, tags, and

product images.

UNIT II

[15 HRS]

Jumla

Joomla Global Configuration, Article Manager, Archive Manager, Frontpage Manager, Section Manager, Category Manager, Media Manager, Menu Manager, Component Manager, Content Manager, Extensions Manager, Module Manager, Plugin Manager, Template Manager, Understanding the concept of Joomla Positions, Changing the layout structure by changing the module position, Understanding Basic Joomla Template, Customizing Joomla Template, Building Custom Joomla Template, Understanding templateDetails.xml File, Creating templateDetails.xml File using tmpl_builder, Linking CSS, Linking Javascript, Understanding include, Displaying content in XHTML, Creating template, installation package, Creating Custom Forms, Changing the Form appearance using CSS.

UNIT III:

[15 HRS]

Drupal

Drupal Overview, Drupal Site Building, Introduction to Drush, Setting a New Site Title and Logo, Adding More Users, Assigning Roles and Permissions to Site Users, Creating a Blog, Working with Blocks, Working with Views, Changing Your Site's Theme, Installing New Add-on Modules, Working with the Drupal Docroot Directory, Creating a Basic Drupal Module, Adding JavaScript to Your Drupal Module.

Moodle

Course categories – an overview, Creating courses, Course requests, Managing courses in bulk, Forms of enrolment, User profiles, Standard user actions, Manual accounts, User authentication, Assigning roles, roles Capabilities, Customizing your front page, The Moodle editor, Module plugins.

REFERENCE

MANDATORY:

1. Douglass, R. T., Little, M., & Smith, J. W. (2006). Building online communities with Drupal, phpBB, and WordPress. Apress.

SUPPLEMENTARY:

1. Ravensbergen, R. (2015). Building E-Commerce Solutions with WooCommerce. Packt Publishing Ltd.
2. Barnett, J. (2015). Drupal 8 for Absolute Beginners. Apress.
3. Buchner, A. (2016). Moodle 3 administration. Packt Publishing Ltd.

WEB REFERENCES:

1. <https://www.tutorialspoint.com/wordpress/index.htm>
2. https://docs.moodle.org/22/en/Moodle_video_tutorials
3. <https://www.tutorialspoint.com/drupal/index.htm>
4. <https://www.tutorialspoint.com/joomla/index.htm>

Course Title: Lab Content Management System

Course Code: COM- III.SD-SK9

Marks: 25

Credits: 03

1. Installing and creating a wordpress website [1P]
2. Installing themes and working with a wordpress editor [1P]
3. Plugins - Contact form and SEO [1P]
4. Creating a blog website using wordpress [1P]
5. Installing woocommerce plugin, add products to the site [1P]
6. Customizing products by setting the product attributes [1P]
7. Develop an ecommerce website [2P]
8. Installing drupal and building a website using a template [1P]
9. User management [1P]
10. Develop website using drupal [1P]
11. Installing moodle and setting up the home page [1P]
12. Managing courses in moodle [1P]
13. User management in moodle [1P]
14. Creating a website using moodle [1P]

ANNEXURE IVA

Summary of changes incorporated in the syllabus of PGDCA at the board of studies meeting held on 1st February 2020.

Syllabi for all courses has been regrouped unit wise in three units for 75 marks course and 4 units for 100 marks course. Below table shows modifications to the in terms of addition or deletion of contents.

Sr No	Semester	Course	Course Code	Existing	Proposed	Justification
	I	DataBase Management Systems	DCA12 Core – II		Practical list updated. Practicals involving UI developments were removed. Mini projects added to the list of practicals.	More stress is given on Schema creation and solving queries as this is fundamental to DBMS.
		Multimedia	DCA14 Elective – I	1.Multimedia on web	This unit is removed.	The syllabus is lengthy . The existing unit is

				2. Study of compression technique	This topic is removed.	already present in the core paper Client Side Technologies Since this is for PGDCA students , not necessary to discuss the implementation . Only concepts are taught.
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