

## 16. MULTIMEDIA AND WEB TECHNOLOGY (Code No. 067) (2017-18)

### Learning Outcomes:

- Ability to develop proficiency in Webpage Development and website management
- Ability to develop proficiency in creating dynamic Web Interface
- Ability to write server and client sides scripts and manage websites
- Ability to design a web page using Image, Audio and Video editing tools
- Ability to understand the basic concepts of Open Source Standards and Open Source softwares
- Ability to understand the basic concepts of networking

### Class XI (Theory)

Duration: 3 hours

Total Marks: 70

Unit No.	Unit Name	Periods			Marks
		Theory	Practical	Total	
1.	INTRODUCTION TO COMPUTER SYSTEMS	22	8	30	15
2.	WEB DEVELOPMENT	50	40	90	25
3.	WEB SCRIPTING	40	35	75	20
4.	MULTIMEDIA AND AUTHORING TOOLS	30	15	45	10
				240	70

### Unit 1: Introduction to Computer System

#### Hardware Concepts:

**Computer Organization** (basic concepts): CPU, Memory (Primary and Secondary), I/O devices

**Input devices:** Keyboard, Keyboard layout (QWERTY and INSCRIPT), Mouse, Light pen, Touch Screen, Graphics Tablet, Microphone, OCR, Scanner, Smart Card reader, Barcode reader, Biometric sensor, Web Camera

**Output Devices:** Monitor/Visual Display Unit (VDU), LCD screen, Television, Printer (Dot Matrix Printer, Desk jet/ Inkjet/ Bubble jet Printer, Laser Printer), Plotter, Speaker

**Secondary Storage Devices:** Fixed and Removable Storage - Hard Disk Drive, CD/DVD Drive, Pen Drive, Blue Ray Disk, Flash Drive, Memory cards

**Memory Units:** Bit, Byte, Kilo Byte ( $2^{10}=1024$  Byte), Mega Byte, Giga Byte, Tera Byte, Peta Byte

**Primary Memory:** Cache, RAM, ROM

**Software Concepts:**

Types of Software: System Software, Utility Software and Application Software

**System Software:**

Operating System, Language Processors - Compiler, Interpreter and Assembler

**Operating System:**

Need for operating system, functions of operating system (processor management, memory management, file management and device management)

Commonly used operating systems: UNIX, LINUX, Windows, Solaris, BOSS (Bharat Operating System Solutions), Mobile OS -Symbian, Android, iOS

**Note:** Students/Teachers can also perform similar operation on any operating system like Linux, Bharti OOS, Windows. It is advised that the teacher while using any one operating system, give a demonstration of equivalent features for the other operating system.

**GUI Components:**

General features, Elements of desktop - taskbar, icon, start button, shortcuts, folder, recycle bin, my computer

**Start Menu:** Program, documents, settings, find/search, help, run, shutdown/logoff

**Program Menu:** Accessories - calculator, text editor, image editor, entertainment (such as sound recorder, media player)

**Control Panel:** Add new hardware, add new software, printer installation, date/time settings, mouse and regional settings, customization of taskbar, start menu, display properties (wallpaper, font settings, color settings, screen savers)

**Utility Software:**

Anti virus, file management tools, compression tools and disk management tools (disk cleanup, disk defragmenter, backup), font converters especially for Indian Languages

**Application software:**

**General Purpose Application software:** Office Tools - word processor, presentation tool, spreadsheet package, database management system

**Specific Purpose Application software:** Domain specific tools - school management system, inventory management system, purchasing system, human resource management system, payroll system, financial accounting, hotel management, reservation system and weather forecasting system, etc.

## Unit 2: Web Page Development

www, Hyper Text Transfer Protocol(HTTP), File Transfer Protocol(FTP), TCP/IP, PPP, Domain names, URL, IP Address, Website, Web browser, Web Server, Web Hosting

### HTML

#### Introduction:

Content creation: creating HTML document using a text editor, saving HTML document, editing a HTML document, viewing HTML documents in a web browser, switching between text editor and web browser windows to view changes

**Browsers:** Mozilla firefox, google chrome, internet explorer, netscape navigator, safari, opera

#### Web Page Authoring Using HTML:

**Basic Concepts:** Concept of tags and attributes, difference between container tag and empty tag, Physical and logical tags

**Structural Tags of HTML:** <HTML>, <HEAD>, <TITLE>, <BODY>

Attributes of <BODY> (BGCOLOR, BACKGROUND, LINK, ALINK, VLINK, TEXT)

**Inserting Breaks:** Line break <BR>, section break <HR>, Attributes of <HR> (WIDTH, ALIGN, SIZE, NOSHADE, COLOR)

**Creating Paragraphs:** <P>, Attributes of <P> (ALIGN)

**Formatting Tags of HTML:** <SMALL>, <BIG>, <B>, <I>, <U>, <EM>, <BLOCKQUOTE>, <PRE>, <SUB>, <SUP>, <STRIKE>, <ADDRESS>, Adding Comments in HTML (<!-- -->), Heading tag (<H1> to <H6>), Attributes of Heading tag (ALIGN), <FONT> tag, <BASEFONT>, Attributes of <FONT> and <BASEFONT> (SIZE, COLOR, FACE)

**Creating Lists:** Ordered Lists: <OL>, <LI>, Attributes of <OL> (TYPE, START, VALUE); Unordered Lists : <UL>, <LI>, Attributes of <UL> (TYPE- disc, circle, square), Definition List : <DL>, <DT>, <DD>

**Creating Links:** Internal linking using <A NAME> and <A HREF>, external linking using <A HREF>, e-Mail linking using <A HREF>

**Concept of URL:** Absolute URL and Relative URL

**Inserting Images:** Inserting inline images using <IMG>, Attributes of <IMG> (SRC, ALIGN, WIDTH, HEIGHT, ALT, BORDER)

#### Adding Music and Movie:

Adding music using <A HREF>, <EMBED> and <AUDIO>, Attributes of <EMBED> (SRC, ALIGN, WIDTH, HEIGHT, LOOP, AUTOSTART, HIDDEN), Attributes of <AUDIO> (autoplay, controls, loop, muted, preload, src)

Adding movie using <A HREF>, <EMBED> and <VIDEO>, Attributes of <EMBED> (SRC, ALIGN, WIDTH, HEIGHT, LOOP, AUTOSTART, HIDDEN), Attributes of <VIDEO> (autoplay, controls, loop, muted, preload, height, width, src)

**Creating Tables:** Creating Table using <TABLE>, Attributes of <TABLE> (BORDER, BGCOLOR, BACKGROUND, ALIGN, CELSPACING, CELLPADDING, WIDTH, HEIGHT, BORDERCOLOR)

Creating rows and columns in a table using <TH>, <TR>, <TD>, Attributes of <TH>, <TR>, <TD> (ALIGN, VALIGN, COLSPAN, ROWSPAN)

Adding headings for a table using <CAPTION>, Attribute of <CAPTION> (ALIGN)

**Creating Frames:** Dividing the window into two or more frames using <FRAME> and <FRAMESET>, Use of percentage dimensions and relative dimensions while dividing the window, use of <NOFRAMES></NOFRAMES>

Attributes of <FRAMESET> (ROWS, COLS, BORDER, FRAMEBORDER)

Attributes of <FRAME> (SRC, NAME, FRAMEBORDER, HEIGHT, WIDTH, MARGINHEIGHT, MARGINWIDTH, SCROLLING, NORESIZE)

**Creating Forms:** Forms for data collection which can be - written to a file, submitted to a database or emailed to someone

Creating Forms using <FORM>, Attributes of <FORM> (NAME, ACTION, METHOD)

Creating Form Interface elements - text box, password box, file selection box, hidden box, checkbox, radio button, button, submit button, reset button using the <INPUT>, Attributes of <INPUT> applicable with different interface elements (NAME, SIZE, VALUE, ALIGN, MAXLENGTH, CHECKED, TYPE)

Multiline input using <TEXTAREA>, Attributes of <TEXTAREA> (NAME, ROWS, COLS, WRAP)

Dropdown list or scrolling list using <SELECT> and <OPTION>, Attributes of <SELECT> (NAME, SIZE, MULTIPLE /SINGLE)

**Document Object Model:** Concept and Importance of Document Object Model, Static Vs Dynamic HTML documents

**Cascading Style Sheets:**

**Introduction to Cascading Style Sheet (CSS):** Creating inline, embedded and external cascading style sheets using <STYLE>, <DIV>, <SPAN> and <LINK>; Attribute of <DIV> and <SPAN> (STYLE), Attributes of <LINK> (REL, TYPE, HREF)

**Font Properties:** FONT-FAMILY, FONT-STYLE, FONT-SIZE, FONT-VARIANT, FONT-WEIGHT and COLOR

**Text Properties:** COLOR, WORD-SPACING, LETTER-SPACING, TEXT-DECORATION, VERTICAL-ALIGN, TEXT-TRANSFORM, TEXT-ALIGN, TEXT-INDENT, LINE-HEIGHT

**Background Properties:** BACKGROUND-COLOR, BACKGROUND-IMAGE, BACKGROUND-REPEAT

**Margin Properties:** MARGINS (all values)

**Padding Properties:** PADDING (all values)

**Border Properties:** BORDER (all values)

**Positioning:** Absolute and Relative

**Additional Features:** Assigning classes

**XML-eXtensible Markup Language:** Introduction, features, advantages

**Structure of XML:** Logical structure, Physical structure

**XML Markup:** Element Markup (example: <foot>Hello</foot>), Attribute Markup

(example: <! element.name property= "value"> )

### **Naming Rules:**

Naming rules for elements, attributes and descriptors

**Components in XML:** Tags, Elements, Root element, Attributes, Entities

### **Comments in XML**

**Developing DTD:** Element Declaration in a DTD: <!ELEMENT elementname (content-type)>

Entity Declarations, Declaring Empty Elements, Container Elements, Unrestricted Elements, Attribute Declarations

### **Element Content Model**

Element Occurrence Indicators: ? ,\*, +

Character Content: PCDATA (Parseable Character data) <! ELEMENT text(#PCDATA)>

Well Formed XML Documents, Valid XML Documents

Document Type Declaration (DTD) - Internal and External DTD

Validating an XML document using a DTD

Developing a DTD, Developing a DTD from XML Code, either automatically or manually

Viewing XML in a web browser, Viewing XML using the XML Data Source Object

## **Unit 3: Web Scripting**

**JavaScript:** Introduction to client side scripting using Java Script, Using Java Script in HTML page with <SCRIPT> tag, external Java Script

**JavaScript Variables:** Declaring variable, assigning values to variables, Java Script literals; Data types in Java Script - String, Number, Boolean, Object, Function, Null, Type casting in Java Script

### **JavaScript Operators:**

JavaScript Operators and Operator precedence:

Unary Operators: +, -, ++, --

Binary Operators :

Arithmetic Operators: +, -, \*, /, %

Assignment Operators : =, +=, -=, \*=, /=, %=

Comparison Operators: <, >, <=, >=, !=, ==

Logical Operators: &&, ||, !

String Operator: + (for concatenation)

Bitwise Operators : &, |, ~, ^, <<, >>

typeof operator

Conditional Operator: ?:

**JavaScript Popup Boxes:** Alert, Confirm and Prompt box

**Comments in JavaScript:** Single line and multiline

**Control Structures in JavaScript:**

**Conditional statements:** if, else, else if.., switch case, break and default statement

**Loops:** for, while, do while loops, continue statement

**JavaScript Functions:**

Define a function, execute a function, return statement, function using arguments, Scope of variables

**Objects in JavaScript:** Window object, document object, location object, form object, working with control objects (Button, reset and submit objects, checkbox objects, and radio objects, select objects, password, text, textarea object)

Creating Dynamic Interface with HTML form controls and JavaScript

**Responding to events:** onLoad, onUnload, onFocus, onBlur, onChange, onMouseOver

new operator, object() constructor

Array objects in Java Script: length property, join(), sort(), reverse(), concat(), for in loop

String object in Java Script: length property, charAt(), concat(), replace(), search(), substr(), toLowerCase(), toUpperCase(), toString()

Date object in Java Script: Date(), getDate(), getDay(), getFullYear(), getHours(), getMilliseconds(), getMinutes(), getMonth(), getSeconds(), getTime()

## **Unit 4: Multimedia and Authoring Tools**

**Concept of Multimedia:** Picture/Graphics, Audio, Video

Digital Images and Digital Image representation, animation, morphing

**Image Formats:** TIFF, BMP, JPG/JPEG, GIF, PDF, PSD, PIC

**Applications:** Poster Design, Still pictures, colored layout, Designing of books, magazines brochures(children's literature, narrative text handling, scripts in Indian Languages, picture books, comics, illustrations with photographs, scientific illustrations, conceptual illustrations, handling of assignment for the market)

**Image Scanning with the help of scanner:** Setting up resolution, size, file formats of images, bitonal, grey scale and color options, preview the image

**Graphic Tools:** Image Editing Software (Photoshop / Coreldraw/GIMP)

**Basic Concepts of Image Creation:** Introduction

**Interface elements of the tool:** menus, toolbox, color control icons, mode control icons, window controls icons

Creating new images, saving images and opening existing images

**Image Handling:** Cropping, adjusting image size, adjusting the size of the work canvas, rotating selections, scaling an object

**Operations on Layers:** Adding new layers, dragging and pasting selected objects on to layers, dragging layers between files, viewing, hiding, editing, moving, copying, duplicating, deleting, merging layers, preserving layers, using adjustment layers

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

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

**Options palette:** opacity, pressure, exposure, paint fade-out rate, making, adjusting, moving, copying, extending, reducing, pasting and deleting selections using selection tools, softening the edges of a selection, hiding a selection border

**Sound:** Recording sound using Sound Recorder (Capture), sound capture through sound editing software (ex: Sound Forge), sound editing (noise correction, effect enhancement)

Importing audio files from external devices and saving them

**Voice Recording Software:** e.g. Audacity, Speech recorder

**Sound File Format:** AIFF (Audio Input File Format from Apple Mac), MIDI, WAV, MP3, ASF (Streaming format from Microsoft)

## Class XI (Practical)

**Duration: 3 hours**

**Total Marks: 30**

### 1. Hands on Experience

**15**

- A topic based website is to be developed by each student using various commands covered in HTML and JavaScript.
- Web pages should be designed with following features:
  - HTML Basic Tag (<HTML>/<HEAD>/<TITLE>/<BODY>/<B>/<I>/<U>/<BR>/<HR>)
  - Anchor/Image insertion/Linking
  - Tables/Frame/Form
  - CSS
  - Buttons/Combo Box/Check Box/Text Box using JavaScript
- XML Markup / Declarations / Element Content Model

Note: During the lab sessions, it is advised to explore hardware components available in the Computer Lab

### 2. Practical File

**05**

The practical file should be made on some domain specific area (with supported documents and printouts) such as

- Make a web page on topics such as 'Swachh Bharat', 'Beti Bachao', 'Crime against Poor Community', 'How can I serve my country' or on any topic of your choice and view it in the browser
- Link few more pages to the developed page, containing related information. (Use HTML tags to make a Static web page)
- Use inline styling to change appearance of contents on the web page.

- Use Style sheets (embedding or linking) to change the appearance of all the pages developed in the above case.
- Enhance the above web site by providing data in table format and add images edited using the Image Editing Tool learnt.
- At this step of web page development add dynamic features such as adding time and current date to the web page using JavaScript.
- Collect user information through form (for feedback etc.). Display selected user details using message box (e.g. saying “Thank you for visiting the website”).

### 3. Project 05

Tools: HTML, DHTML, CSS, Java Script, and Image editing software

#### Suggested topics:

1. Website of a student containing personal information about student such as email address, photograph, likes, dislikes, hobbies, class, school name, achievements, favorite restaurant , favorite tourist places, ultimate aim of life, message to mankind, role model.
2. Website of a School providing information of the school containing Moto of school, photograph of school, brief description of school, name of the principal, facilities and infrastructure, sports, faculty and departments information, results and achievements of students.
3. e-shopping website providing information about types of items, brief description about each item with pictures, price list, online ordering and billing.
4. Website of “Tourism in a State” to provide the information about various tourist places, various modes of journey available, types of hotels available, online booking etc.
5. Your blog in an Indian language.

#### Note:

- For developing the website collect real information from various sources.
- It is advised to break up the above-mentioned case studies into smaller modules as per coverage of the course.
- Teachers can provide alternative case studies of similar kind.
- Project development can be done in groups and can be accessed by other groups and teacher. The teacher can use the average marks as the final marks.
- Project will be assessed on the following rubrics: Originality, Innovation, Aesthetics, Techniques.
- Teachers may encourage peer group assessment of group projects

### 5. Viva Voce 05

During the final practical examination, oral questions will be asked from the syllabus covered in class XI and the project developed by the student(s).