MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
(Formerly West Bengal University of Technology)
Syllabus of BCA
(Effective from 2023-24 Academic Sessions)

SEMESTER: II

DEFINITION OF CREDIT

1 HR LECTURE PER WEEK	1 CREDIT
1 HR TUTORIAL PER WEEK	1CREDIT
2 HR PRACTICAL PER WEEK	1 CREDIT

SUBJECT NUMBERING SCHEME:

CODE FOR THE DEPT. OFFERING SUBJECT	SUBJECT TYPE	SEM	SUBJECT CODE

C	CORE MAJOR

SUBJECT NAME: Computer Architecture **Credit: 3L + 2P**
SUBJECT CODE: BCAC201

COURSE OBJECTIVE:

The objective of the course "Computer Architecture" is to provide students with a comprehensive understanding of the fundamental principles, components, and design principles that govern modern computer systems. Throughout the course, students will delve into the intricate workings of computer hardware, its organization, and how it interacts with software. The main goals are to enable students to grasp the inner workings of computers, analyze their performance, and make informed design decisions for efficient and reliable computing systems.

COURSE OUTCOME	
CO1	To enable the students to understand the functionality and implementation of computer system.
CO2	To familiarize with the various instruction codes and formats of different CPUs.

CO3	To introduce the students to I/O and memory organization of computer system
CO4	To deliver an overview of Control Unit of a computer system
CO5	To learn the usage of parallel and vector processing.

DETAILED SYLLABUS:

Module No:	NAME OF THE TOPIC	HOURS	MARKS
M1	Data Representation: Number Systems – decimal, binary, octal, hexadecimal, alphanumeric representation, 2. Complements – 1's complement, 2' complement, 9's complement, 10' complement, [r-1]'s complement, r's complement, 3. Fixed point representation – Integer representation, arithmetic addition, arithmetic subtraction, overflow, decimal fixed point representation, 4. Floating point representation, 5. IEEE 754 floating point representation	**4**	**5**
M2	Computer arithmetic: Addition algorithm of sign magnitude numbers, Subtraction algorithm of sign magnitude numbers, Addition algorithm of signed 2's complement data, Subtraction algorithm of signed 2's complement data, Multiplication algorithm, Booth's algorithm, Division algorithm	**4**	**5**
M3	Register transfer and micro-operations: Register transfer language, Register transfer, Bus system for registers, Memory transfers – memory read, memory write, Micro operations – register transfer micro operations, arithmetic micro operations, logic micro operations, shift micro operations, Binary adder, binary adder subtractor, binary incrementer, arithmetic circuit for arithmetic micro operations, One stage logic circuit, Selective set, Selective complement, Selective clear, ask, Insert, Clear	**5**	**5**
M4	Basic Computer organization and design: Instruction codes, Direct address, Indirect address & Effective address, List of basic computer registers, Computer instructions: memory reference, register reference & input – output instructions, Block diagram & brief idea of control unit of basic computer, Instruction cycle	**4**	**5**
M5	Micro programmed control: Control memory, Address sequencing, Micro program examples	**4**	**5**

M6	Central processing unit: General register organization, Stack organization, Register stack, Memory stack, Stack operations – push & pop, Evaluation of arithmetic expression using stack, Instruction format, Types of CPU organization [single accumulator, general register & stack organization] & example of their instructions, Three, two, one & zero address instruction, Definition and example of data transfer, data manipulation & program control instructions, Basic idea of different types of interrupts [external, internal & software interrupts], Difference between RISC & CISC	**6**	**5**
M7	Pipeline and vector processing: Parallel processing, Flynn's classification, Pipelining, Example of pipeline, space time diagram, speedup, Basic idea of arithmetic pipeline, example of floating point addition/ subtraction using pipeline	**6**	**10**
M8	Input – output organization: Peripheral devices, Input – output interface, Isolated I/O, Memory mapped I/O, Asynchronous data transfer: strobe & handshaking, Programmed I/O, Interrupt initiated I/O, Basic idea of DMA & DMAC Input – output processor	**6**	**10**
M9	Memory organization: Memory hierarchy, Main memory definition, types of main memory, types of RAM, ROM, difference between SRAM & DRAM, Cache memory, Cache memory mapping – Direct, Associative, Set Associative, CAM, hardware organization of CAM, Virtual memory, mapping using pages, page fault, mapping using segments, TLB, Auxiliary memory, diagrammatic representation of magnetic disk & hard disk drive, Definitions of seek time, rotational delay, access time, transfer time, latency	**6**	**20**
	INTERNAL EXAMINATION	**3**	**30**
	TOTAL	**48**	**100**

Practical:

SUBJECT NAME: Computer Architecture Lab **Credit: 2**
SUBJECT CODE: BCAC291

List of Practical:

1. Basic gates and Universal gates. Implementation of Half & full adder. Half & full subtractor,
2. 4 bit logical unit, 4 bit arithmetic unit, BCD adder, 4 bit adder/ subtractor, Carry look ahead adder, Design of ALU for multi bit operation, comparators.
3. 8:1 MUX IC verification, 16:1 MUX using IC 74151, dual 2 to 4 Decoder/ Demultiplexer IC evaluation. Priority encoder.
4. Read/ write operation using RAM IC, Cascading RAM ICs

SUGGESTED READING:

1. V. Carl, G. Zvonko and S. G. Zaky, "Computer organization", McGraw Hill, 1978.
2. B. Brey and C. R. Sarma, "The Intel microprocessors", Pearson Education, 2000.
3. J. L. Hennessy and D. A. Patterson, "Computer Architecture A Quantitative Approach", Morgan Kauffman, 2011.
4. W. Stallings, "Computer organization", PHI, 1987.
5. M. Morris Mano "Computer System Architecture " PEARSON
6. Rajaraman – "Computer Organization & Architecture", PHI
7. B.Ram – "Computer Organization & Architecture", Newage Publications
8. J.P. Hayes " Computer Architecture & Organisation", TATA MCGRAW HILL

SUBJECT NAME: Basics of Web Design Using Html, CSS, Java Script Credit: 3L + 2P
SUBJECT CODE: BCAC202

COURSE OBJECTIVE:

The objective of the course "Basics of Web Design Using HTML, CSS, JavaScript, and Web Hosting" is to provide students with a solid foundation in web development, enabling them to create and publish static websites. Throughout the course, students will learn essential technologies and techniques for designing and building web pages, as well as the basics of hosting and deploying websites on the internet. By the end of the course, students should be proficient in creating static websites using HTML, CSS, and JavaScript, and have a clear understanding of web hosting and deployment procedures.

COURSE OUTCOME	
CO1	To gain knowledge about the protocols used in various services of internet.
CO2	Use different HTML components for designing the Web page for solving real world application
CO3	Students can implement modern, responsive, mobile first CSS framework.
CO4	to gain knowlegge about synchronous and asynchronous Java script
CO5	Student knows the different methodologies realted to the hosting web application

DETAILED SYLLABUS:

Module No:	NAME OF THE TOPIC	HOURS	MARKS

M1	Introduction to Web Design: Introduction of Internet, WWW, Website, Working of Websites, Web pages, Front End, Back End, Client and Server Scripting Languages, Responsive Web Designing, Types of Websites (Static and Dynamic Websites), representation of URL format, port number, Http and https protocol, IP addressing Internet Applications: Internet services, Electronic Mail(E-Mail), File Transfer, Real-Time User Communication, Remote Login	4	10
M2	HTML Basics HTML: Introduction, Basic Structure of HTML, Head Section and Elements of Head Section, Formatting Tags: Bold, Italic, Underline, Strikethrough, Div, Pre Tag Anchor links and Named Anchors Image Tag, Paragraphs, Comments, Tables: Attributes –(Border, Cellpadding, Cell spacing , height , width), TR, TH, TD, Rowspan, Colspan Lists : Ordered List , Unordered List , Definition List, Forms,Form Elements, Input types, Input Attributes, Text Input Text Area, Dropdown, Radio buttons , Check boxes, Submit and Reset Buttons Frames: Frameset, nested Frames. HTML 5 Introduction, HTML5 New Elements: Section, Nav, Article, Aside, Audio Tag, Video Tag, HTML5 Form Validations: Require Attribute, Pattern Attribute, Autofocus Attribute, email, number type, date type , Range type, HTML embed multimedia, HTML Layout, HTML Iframe	9	25
M3	CSS: Introduction to CSS, Types of CSS, CSS Selectors : Universal Selector ,ID selector, Tag Selector, Class Selector, Sub Selector, Attribute Selector, Group Selector, CSS Properties: Back Ground properties, Block Properties, Box properties, List properties, Border Properties, Positioning Properties, CSS Lists CSS Tables, CSS Menu Design CSS Image Gallery,	12	20
M4	CSS Framework: Web Site Development using W3.CSS Framework, W3.CSS Intro, W3.CSS Colors, W3.CSS Containers, W3.CSS Panels, W3.CSSBorders, W3.CSS Fonts, W3.CSS Text, W3.CSS Tables, W3.CSS List, W3.CSSImages, W3.CSS Grid	8	20
M5	JavaScript and Angular Js: Introduction to Client Side Scripting Language, Variables in Java Script, Operators in JS, Conditions Statements, JS Popup Boxes, JS Events, Basic Form Validations in JavaScript. Introduction to Angular JS: Expressions, Modules and Directives.	8	18

M6	Web hosting Basics, Documents Interchange Standards, Components of Web Publishing, Document management, Web Page Design Considerations and Principles, Search and Meta Search Engines, WWW, Browser, HTTP, Publishing Tools	4	7
	INTERNAL EXAMINATION	3	30
	TOTAL	48	100

Practical:

SUBJECT NAME: Basics of Web Design Using Html, CSS, Java Script Lab Credit:2
SUBJECT CODE: BCAC292

Practical Assignment: Building a Personal Portfolio Website

Objective: The objective of this practical assignment is to apply the concepts learned in the course "Basics of Web Design Using HTML, CSS, and JavaScript" to create a personal portfolio website. The portfolio website will showcase your skills, projects, and accomplishments, and demonstrate your understanding of web design principles, responsive design, and JavaScript interactivity.

Requirements: Your personal portfolio website should meet the following criteria:

1. Home Page: Create an attractive and informative home page that introduces yourself and includes a brief summary of your background, skills, and interests.
2. About Me Page: Design an "About Me" page that provides more detailed information about your education, work experience, and personal interests.
3. Projects Page: Showcase your projects with descriptions and images. Use a grid or card layout to present the projects neatly.
4. Contact Page: Include a contact form or your contact information (email, phone number, LinkedIn profile, etc.) to allow visitors to reach out to you.
5. Responsive Design: Ensure that your website is responsive and displays correctly on various devices, including desktops, tablets, and mobile phones.
6. Navigation: Implement a navigation bar or menu that allows visitors to easily navigate between different pages of your website.
7. CSS Styling: Apply CSS styles to enhance the overall appearance of your website, including fonts, colors, backgrounds, and layout.
8. JavaScript Interactivity: Incorporate JavaScript to add interactive elements to your website, such as a responsive navigation menu, image sliders, or a contact form validation.
9. External Resources: Utilize external resources, such as Google Fonts or Font Awesome icons, to enhance the design and functionality of your website.
10. Code Organization: Organize your HTML, CSS, and JavaScript code into separate files and link them appropriately in your web pages.
11. Valid HTML and CSS: Ensure that your HTML and CSS code is valid, following W3C standards.

SUGGESTED READING:

1. "Learning Web Designing" by Ramesh Bangia, Khanna Book Publishing Co.
2. "HTML, CSS, and JavaScript All in One: Covering HTML5, CSS3, and ES6" by Julie C. Meloni and Jennifer Kyrnin Publisher: BPB Publications
3. "Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Niederst Robbins Publisher: O'Reilly Media
4. "HTML and CSS: Design and Build Websites" by Jon Duckett Publisher: Wiley India Pvt. Ltd.
5. "JavaScript and JQuery: Interactive Front-End Web Development" by Jon Duckett Publisher: Wiley India Pvt. Ltd.
6. "Web Design with HTML, CSS, JavaScript and jQuery Set" by Jon Duckett Publisher: Wiley India Pvt. Ltd.
7. "Head First HTML and CSS: A Learner's Guide to Creating Standards-Based Web Pages" by Elisabeth Robson and Eric Freeman Publisher: O'Reilly Media
8. "A Smarter Way to Learn HTML & CSS: Learn it faster. Remember it longer." by Mark Myers Publisher: CreateSpace Independent Publishing Platform
9. "Web Development and Design Foundations with HTML5" by Terry Felke-Morris Publisher: Pearson Education India
10. "Web Designing & Development" by Tanweer Alam, Khanna Book Publishing.