Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, CHHATRAPATI SAMBHAJINAGAR.

CIRCULAR NO.SU/ Sci./College/NEP-2020/104/2024

It is hereby inform to all concerned that, In continuation circular No.SU./Revised B.Sc./NEP/72/2024/25588-96 dated 29.04.2024, the revised syllabi prepared by the Board of Studies/Ad-hoc Boards and recommended by the Dean, Faculty of Science & Technolgy, the Academic Council at its meeting held on 08 April 2024 has accepted **the following Revised B.Sc. Course Structure & Curriculum** as per direction by the State Government dated on 13 March 2024 under the Faculty of Science & Technology (as per National Education Policy – 2020) run at the Affiliated Colleges, Dr.Babasaheb Ambedkar Marathwada University as appended herewith.

Sr.No.	Courses	Semester
1	Physics	Ist and IInd semester
2	Instrumentation Practice	Ist and IInd semester
3	Electronics	Ist and IInd semester
4	Mathematics	Ist and IInd semester
5	Industrial Chemistry	Ist and IInd semester
6	Agrochemical Fertilizer	Ist and IInd semester
7	Horticulture	Ist and IInd semester
8	Biochemistry	Ist and IInd semester
9	Botany	Ist and IInd semester
10	Zoology	Ist and IInd semester
11	Biotechnology	Ist and IInd semester
12	bioinformatics	Ist and IInd semester
13	Microbiology	Ist and IInd semester
14	Dairy Science & TEchnology	Ist and IInd semester
15	Statistics	Ist and IInd semester
16	computer Science	Ist and IInd semester
17	Geology	Ist and IInd semester
18	Chemistry	Ist and IInd semester
19	Analytical Chemistry	Ist and IInd semester
20.	Polymer Chemistry	Ist and IInd semester
21.	Environmental Science	Ist and IInd semester
22.	Fishery Science	Ist and IInd semester

This is effective from the Academic Year 2024-25 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Chhatrapati Sambhajinagar
-431 004.
REF.NO. SU/Sci./2024/27128-35
Date:-27.05.2024.

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**Deputy Registrar,
Academic Section.**

Copy forwarded with compliments to :-

1] **The Principal of all concerned Colleges,**
Dr. Babasaheb Ambedkar Marathwada University,

2] **The Director, University Network & Information Centre, UNIC, with a request to upload this Circular on University Website.**

Copy to :-

1] The Director, Board of Examinations & Evaluation, Dr.Babasaheb Ambedkar Marathwada University,Chhatrapati Sambhajinagar.

2] The Section Officer,[B.Sc.Unit] Examination Branch, Dr.Babasaheb Ambedkar Marathwada University,Chhatrapati Sambhajinagar.

3] The Programmer [Computer Unit-1] Examinations, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar.

4] The Programmer [Computer Unit-2] Examinations, Dr.Babasaheb Ambedkar Marathwada University,Chhatrapati Sambhajinagar.

5] The In-charge,[E-Suvidha Kendra], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr.Babasaheb Ambedkar Marathwada University,Chhatrapati Sambhajinagar.

6] The Public Relation Officer, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar.

7] The Record Keeper, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar.

Dr. Babasaheb Ambedkar Marathwada University,

Chhatrapati Sambhajinagar- 431001

B.Sc. Degree Programme

(Three Year / Four Years   (Hons) /Four Years (Hons with Research)

Course Structure and syllabus for B. Sc. First Year

(Revised)

(AS PER NEP-2020)

Subject: B.Sc. Computer Science (MAJOR)

3 / 4 Year Degree Course

Effective from 2024-25

PREFACE

As we stand on the threshold of a new era in education, the dawn of the National Education Policy 2020 illuminates our path toward a holistic, inclusive, and progressive educational landscape. The Bachelor of Science (B. Sc.) curriculum outlined herein reflects the ethos and aspirations of this transformative policy, aiming to equip learners with the knowledge, skills, and values necessary to thrive in the dynamic world of the 21st century.

At its core, the National Education Policy 2020 envisions an educational framework that is learner-centric, multidisciplinary, and geared towards fostering creativity, critical thinking, and innovation. It emphasizes the integration of knowledge across disciplines, breaking down traditional silos to encourage holistic understanding and application of concepts. The Bachelor of Science (B. Sc.) curriculum embodies these principles by offering a diverse array of courses spanning various scientific domains, while also incorporating interdisciplinary studies to nurture well-rounded graduates capable of addressing complex challenges with agility and insight.

Furthermore, the curriculum is designed to promote experiential learning, research, and hands-on exploration, recognizing the importance of practical engagement in deepening understanding and cultivating real-world skills. Through laboratory work, field experiences, internships, and project-based learning opportunities, students will have the chance to apply theoretical knowledge in practical settings, develop problem-solving abilities, and cultivate a spirit of inquiry and discovery.

Integral to the National Education Policy 2020 is the commitment to inclusivity, equity, and access to quality education for all. The Bachelor of Science (B. Sc.) curriculum reflects this commitment by embracing diversity in perspectives, backgrounds, and experiences, and by fostering an inclusive learning environment where every student feels valued, supported, and empowered to succeed.

Moreover, the curriculum emphasizes the cultivation of ethical values, social responsibility, and global citizenship, instilling in students a sense of accountability towards society and the environment. By integrating courses on ethics, sustainability, and social sciences, the Bachelor of Science (B. Sc.) program aims to produce graduates who are not only proficient in their respective fields but also compassionate, ethical leaders committed to making a positive impact on the world.

As we embark on this journey of educational transformation guided by the National Education Policy 2020, the Bachelor of Science (B. Sc.) curriculum stands as a testament to our collective vision of a more equitable, inclusive, and enlightened society. It is our hope that through rigorous academics, innovative pedagogy, and unwavering dedication to excellence, we can inspire the next generation of scientists, scholars, and change-makers to realize their full potential and contribute meaningfully to the advancement of knowledge and the betterment of humanity.

Students will have to choose any three subjects as a **Major 1, Major 2, Major 3,** from Basket 1 under the Faculty of Science and Technology.

Students will be having three subject options of equal credits (instead of Major and / or minor verticals) in the first year. Students will have to select / declare choice of one subject **as a major subject** in the beginning of second year **out of three major options M1, M2 and M3 (which were opted in the first year).**

Detailed Illustration of Courses included in 1st and 2nd semester:

1) **Major** (Core) subject are mandatory.

DSC-1 : This is a 2 credit theory course corresponding to Major (core) subject
DSC-2 : This is a 2 credit practical course based on DSC-1
DSC-3 : This is a 2 credit theory course corresponding to Major (core) subject
DSC-4 : This is a 2 credit practical course based on DSC-3

2) **Generic / Open Elective (GE/OE):** (Needs to be chosen (any two) from pool of courses available at respective college). **These courses should be chosen compulsorily from faculty other than that of Major.**

GE/OE -1 : This is a 2 credit theory course should be chosen compulsorily from faculty other than that of Major.
GE/OE -2 : This is a 2 credit theory course should be chosen compulsorily from faculty other than that of Major.

3) **SEC** (Skill Enhancement Courses) : Choose any one from pool of courses. These courses needs to be designed to enhance the technical skills of the students in specific area.

SEC-1 : This is a 1 credit theory course to enhance the technical skills of the students in specific area.
SEC-2 : This is a 1 credit practical course based on SEC-1.

4) **VSC** (Vocational Skill Courses) : Choose any one from pool of courses. These courses should be based on Hands on Training corresponding to Major (core) subject.

VSC-1 : This is a 1 credit theory course based Hands on Training corresponding to Major (core) subject.
VSC-2 : This is a 1 credit practical course based on VSC-1

5) **AEC** (Ability Enhancement courses): The focus of these courses should be based on linguistic and communication skills.

AEC-1 : English
This is a 2 credit theory course based on linguistic proficiency. It will be common for all the faculty.

AEC-2 : English

This is a 2 credit theory course based on linguistic proficiency. It will be common for all the faculty.

6) **IKS** (Indian Knowledge System) : The courses related to traditional and ancient culture of India will be included in this section. The respective college will have to choose one of the courses from the pool of courses designed by the University.

IKS-1 : To be chosen from the pool of courses designed by the University
This is a 2 credit theory course based on Indian Knowledge System. It will be common for all the faculty

7) **VEC** (Value Education Courses): The courses such as understanding India, Environmental Science / Education, Digital and Technological solutions etc will be part of Value Education Courses.

VEC-1 : Constitution of India
This is a 2 credit theory course based on value education. It will be common for all the faculty

8) **CC** (Curricular Courses): The courses such as Health and wellness, Yoga education, Sports and Fitness, Cultural activities, NSS/NCC, Preforming Arts.

CC-1 : Health and Wellness
This is a 2 credit practical course based on Co-curricular activities. It will be common for all the faculty

CC-2 : Yoga education / Sports and Fitness
This is a 2 credit practical course based on Co-curricular activities. It will be common for all the faculty

Structure of B. Sc. (Three / Four Years Honours / Honours with Research Degree) Programme with Multiple Entry and Exit Options

Subject : B.Sc. (Computer science)

BSc First Year: 1st Semester

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theory	Practical	Theory	Practical	
Major (Core) M1 Mandatory	DSC-1	Basics of Computer	2		2		2+2 = 4
	DSC-2	Practical based on DSC-1		4		2	
Major (Core) M2 Mandatory	DSC-3	----	2		2		2+2 = 4
	DSC-4	Practical based on DSC-3		4		2	
Major (Core) M3 Mandatory	DSC-5	------	2		2		2+2 = 4
	DSC-6	Practical based on DSC-5		4		2	
Generic / Open Elective (GE/OE) (Choose any two from pool of courses) **It should be chosen compulsorily from the faculty other than that of Major**	GE/OE-1	To be chosen from other faculty	2		2		2
SEC (Skill Enhancement Courses) (Choose any one from pool of courses)	SEC-1	A) HTML and CSS B) Graphics Designing using Canva	1		1		2
	SEC-2	Practical's based on SEC-1A Practical's based on SEC-1B		2		1	
AEC, VEC, IKS	AEC-1	English (Common for all the faculty)	2		2		2+2 =4
	IKS-1	Choose any one from pool of courses	2		2		
OJT/ FP/CEP/CC/RP	CC-1	Health and Wellness (Common for all the faculty)		4		2	2
			13	18	13	09	22

GE/OE-1: Cyber Security (This Course will be available for the students from other faculty)

BSc First Year: 2nd Semester

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theory	Practical	Theory	Practical	
Major (Core) M1 Mandatory	DSC-7	C- Programming	2		2		2+2 = 4
	DSC-8	Practical based on DSC-7		4		2	
Major (Core) M2 Mandatory	DSC-9	----	2		2		2+2 = 4
	DSC-10	Practical based on DSC-10		4		2	
Major (Core) M3 Mandatory	DSC-11		2		2		2+2 = 4
	DSC-12	Practical based on DSC-11		4		2	
Generic / Open Elective (GE/OE) (Choose any two from pool of courses) **It should be chosen compulsorily from the faculty other than that of Major**	GE/OE-2	To be chosen from other faculty	2		2		2
VSC (Vocational Skill Courses) (Choose any one from pool of courses)	VSC-1	A) JavaScript B) Computer Hardware	1		1		2
	VSC-2	1) Practical's based on VSC-A 2) Practical's based on VSC-B		2		1	
AEC, VEC, IKS	AEC-1	English (Common for all the faculty)	2		2		2+2 =4
	VEC-1	Constitution of India (Common for all the faculty)	2		2		
OJT/ FP/CEP/CC/RP	CC-2	Yoga Education / Sports and Fitness (Common for all the faculty)		4		2	2
			13	18	13	09	22

Exit Option : Award of UG Certificate in 3 Majors with 44 credits and an additional 4 credits of core NSQF course / Internship OR continue with Major and Minor

GE/OE-2: E-Commerce and E-Contracts (This Course will be available for the students from other faculty)

General Guidelines for Course Selection

1) The Major subject is the discipline or course of main focus, bachelors degree shall be awarded in that discipline / subject.

2) Students will have to choose any three subjects as a Major 1, Major 2, Major 3, from **Basket 1** under the Faculty of Science and Technology (based on the available options in the respective college).

3) Students will be having three subject options of equal credits (instead of Major and / or minor verticals) in the first year.

4) In the beginning of second year, students will have to select / declare choice of **one major subject** and **one minor subject** from three major options M1, M2 and M3 (**which were opted in the first year)**

5) Once the students finalize their **Major Subject** and **Minor Subject** in the beginning of the second year of the programme, they shall pursue their further education in that particular subject as their **Major and Minor** subjects. Therefore, from second year onwards curriculum of the Major and Minor subjects shall be different.

6) Students are required to select **Minor subject** from **other discipline of the same faculty**

7) Students are required to select **Generic /Open Elective** (vertical 3 in the credit framework) **compulsorily from the faculty different than that of their Major / Minor subjects.**

8) Vocational Skill Courses and Skill Enhancement Courses (VSC and SEC) shall be related to the Major subject

9) Curriculum of Ability Enhancement Courses (AEC), Value Education Courses (VEC), Indian Knowledge System (IKS), and Co-curricular Courses (CC) will be provided by the University separately.

Programme Educational Objectives (PEOs) :

Programme Educational Objectives (PEOs) for the Bachelor of Science Curriculum under the National Education Policy 2020:

1. **Mastery of Discipline-Specific Knowledge**: Graduates of the Bachelor of Science program will demonstrate a deep understanding of fundamental principles, theories, and methodologies in their chosen scientific discipline, enabling them to analyze complex problems, propose innovative solutions, and contribute to advancements in their field.

2. **Interdisciplinary Proficiency**: Graduates will possess the ability to integrate knowledge and skills from multiple scientific disciplines, fostering a holistic approach to problem-solving and innovation. They will be equipped to address multifaceted challenges by drawing upon diverse perspectives and methodologies.

3. **Critical Thinking and Analytical Skills:** Graduates will develop strong critical thinking abilities, enabling them to evaluate information rigorously, analyze data effectively, and make informed decisions based on evidence. They will demonstrate proficiency in applying logical reasoning and scientific methods to solve problems and generate new knowledge.

4. **Leadership and Innovation:** Graduates will demonstrate leadership qualities and entrepreneurial mindset, capable of initiating and driving positive change in their organizations and communities. They will exhibit creativity, resilience, and adaptability, harnessing innovation to address complex challenges and seize opportunities for growth and advancement.

5. **Global Citizenship and Cultural Sensitivity**: Graduates will possess a global perspective and cultural sensitivity, recognizing the interconnectedness of diverse communities and the importance of collaboration across borders. They will engage in cross-cultural dialogue, embrace diversity, and contribute to the advancement of knowledge and understanding on a global scale.

These Programme Educational Objectives serve as guiding principles for the Bachelor of Science curriculum, reflecting our commitment to nurturing well-rounded graduates who are prepared to excel in their careers, contribute to society, and lead meaningful lives in a rapidly changing world.

Programme Outcomes (POs) :

The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well-versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020:

> **PO1.** To develop problem solving abilities using a computer.

> **PO2.** To prepare necessary knowledge base for research and development in Computer Science.

> **PO3. Ethics:** Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries.

> **PO4. Individual and team work:** Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments.

> **PO5. Communication:** Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

> **PO6. Project management**: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment.

> **PO7. Life-long learning**: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change

> **PO8.** To train students in professional skills related to Software Industry

These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and learning outcomes.

Programme Specific Outcomes (PSOs):

PSO1. **Domain knowledge:** Apply the knowledge of Computer Science fundamental, and advanced areas of Computer Science to provide comprehensive solution

PSO2. **Problem Analysis:** Identify Computer Science related problems at varied complexity and analyze the same to formulate/ develop substantiated conclusion

PSO3. **Design Development of solutions:** Design/ develop solutions for problems at varied complexity in various areas of Computer Science to address changing challenges put forward by market demand/ stakeholder

PSO4. **Conduct Investigation of complex problems:** Use established knowledge and methods to design of experiments, analyze resulting data and interpret the same to provide valid conclusions.

PSO5. **Modern tools:** Create, select, and apply appropriate techniques, resources, and modern electronics and relevant IT tools including prediction and modeling to complex Information Technology related activities with clear understanding of the limitations.

B. Sc.

Computer Science (Major)

Semester - I

M1-DSC-1 : Basics of Computer

Total Credits : 02   Total Contact Hours : 30 Hrs.

Maximum Marks : 50

Learning Objectives of the Course:

    i)   To learn basics of Computer System
    ii) To Learn about Computer Languages
    iii) To Learn different number systems used

Course Outcomes (COs) :

After completion of the course, students will be able to –

    i)   Implement basic C programs
    ii) Develop and implement conditional and iterative statements
    iii) Implement different types of arrays
    iv) Develop and implement modular applications in C using functions
    v) Implement structure and pointers

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Fundamentals of Computer System** Introduction, Characteristics & features of Computers, Components of Computers, Organization of Computer. **Number Systems and Arithmetic** Decimal, Binary, Octal, Hexadecimal Number System. Decimal to Binary conversion(Double-dabble method only), Binary to Decimal Conversion, Hexadecimal to binary, binary to Hexadecimal, Binary Arithmetic : Binary addition and subtraction. BCD	10 Hrs
II	**Logic Gates** Logic Gates : AND, OR, NOT, Ex-OR, and Ex-NOR gates NAND and NOR as Universal building block. **Flip flops :** RS Flip-Flop, Clocked RS Flip-Flop, D- Flip-Flop, JK Flip-Flop , Triggering, preset and Clear. T-Type Flip-Flop, MS JK Flip-Flop. Registers, Classifications of Registers, SIPO, SISO, PIPO,PISO shift Registers.	10 Hrs
III	**Programming Methodology** Introduction to Programming, Definition of program and programmer, features of good programming language, Bugs and Debugging	10 Hrs

| | Pseudocode or Structured English, Algorithm, Definition and basic features and properties of algorithm. | |
| | Principles of flowcharting, Flowcharting symbols, converting algorithms to flowcharts, problem solving through algorithm and flowchart. | |

Reference Books:

1. Fundamentals of Computers by E Balagurusamy Tata McGraw Hill

2. Fundamentals of Computer by V. Rajaraman, PHI publication.

3. Digital Electronics by D. K. Kaushik, Dhanpat Rai Publishing Company.
4. Modern Digital Electronics by R. P. Jain Tata McGraw Hill.
5. Programming Logic and Design, Comprehensive By Joyce Farrell
6. Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffman, Pearson, 2015.

	M1-DSC-2: Practical based on DSC-1 (Basics of Computer)

Total Credits : 02	Total Contact Hours : 60 Hrs

Maximum Marks : 50

List of experiments to be carried out based on the course DSC-1.

1	Testing of AND, OR and NOT Gate.
2	Testing of NAND and NOR gate
3	Testing of XOR and X-NOR gate
4	Implementation of Boolean Functions using MUX
5	Construction of half and full adder using XOR and NAND gates and verification of its operation.
6	The practical for Half adder. Full adder, encoder and Multiplexer.
7	Practical for SR Flip flop
8	Practical for JK Flip Flop
9	Practical based on D-Flip flops
10	Write an algorithm to find average of three numbers
11	Write an algorithm to find area of circle
12	Write an algorithm to Find largest number from two numbers
13	Write an algorithm to check entered number is positive, negative or zero
14	Write an algorithm to demonstrate switch case statement
15	Write an algorithm to print odd numbers from 1 to N

	SEC-1 A : HTML and CSS	
Total Credits: 01		Total Contact Hours: 15 Hrs
Maximum Marks : 50		

Learning Objectives of the Course:

i) Understanding basics of web browsers and its types.
ii) Comprehend the foundational structure of HTML documents, encompassing elements, tags, attributes, and their interconnections.
iii) Understand the basics concept and principles of web technologies.
iv) Gain practical skills in styling web site using CSS.

Course Outcomes (COs) :

After completion of the course, students will be able to –

i) Understand fundamentals of web technologies.
ii) Construct visually appealing static web page.
iii) Understand linking in web page.
iv) Understand basics of forms.
v) Use CSS for enhanced presentation and user experience.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to HTML: Overview of HTML, definition, HTML document object model (HTML DOM), Learn HTML Using Notepad. Introduction HTML elements and attributes. **HTML headings and paragraphs:** Basics of HTML heading, understanding use of <h1> to <h6>tags , introduction to <p> tag. Attributes of each tag. **HTML text formatting and quotation tags:** HTML <b>, <i>, <u>, <em>, <strong>, <sub>, <sup>, <mark>, <del>, tags. Understanding the use of blockquote>,<q>, <abbr>, <address>, <cite>, and <bdo> tags.	05 Hrs
II	**HTML images and links:** use of images, image file formats: jpg, png, bmp, and use of image tags, and its attributes. Introduction to anchor tag and its attributes. Introduction to <link> tag and its attributes. **Introduction to HTML list tags, tables and forms:** ordered list, unordered list, definition list, introduction to <table> tags, <th>, <tr>, and <td> tags and its attributes. Introduction to form tag and its attributes, GET and POST methods, <input> tag and its attributes. Introduction to <button> tag.	05 Hrs
III	**Introduction to Cascading Style Sheet:** Definition of CSS. Purpose of CSS, syntax and structure of CSS. CSS types: Inline CSS, style as attribute, style as tag Internal CSS, External CSS Basic selectors: element, class and Id selector Universal and attribute selectors Grouping and chaining selectors Advanced selectors and combinators: :hover, :active, :visited Understand CSS box Model (content, padding, border, margin) Setting padding, border, margin property	05 Hrs

Reference Books:
1 WEB TECHNOLOGIES 2010 by Uttam K.
2 "Responsive Web Design with HTML5 and CSS" by Ben Frain
3. HTML and CSS: Design and Build Websites by John Duckett.
4 "Web development and Design Foundations with HTML5" by Terry Felke-Morris

SEC-1B: Graphics Designing

Total Credits: 01   Total Contact Hours: 15 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

i) **Understand Canva Interface:** Familiarize yourself with the layout and tools available in Canva for creating graphics and designs.

ii) **Create Visual Content:** Learn to design various types of visual content such as social media posts, posters, and presentations using Canva's templates and design elements.

iii) **Apply Design Principles:** Gain knowledge of basic design principles such as layout, color theory, and typography, and apply them effectively in your Canva designs.

iv) **Explore Collaboration and Sharing:** Discover features for collaborating with others on design projects and learn how to share and export your designs for different purposes and platforms.

Course Outcomes (COs) :

After completion of the course, students will be able to -

i) Design visually appealing graphics and layouts using Canva's tools and templates.

ii) Apply fundamental design principles such as layout, color theory, and typography to create professional-looking designs.

iii) Collaborate effectively with others on design projects using Canva's collaboration features.

iv) Share and export their designs for various purposes and platforms, demonstrating proficiency in using Canva for real-world applications.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Module 1: Getting Started with Canva (5 hours)** 1. Introduction to Canva: Understanding the Interface (1 hour) 2. Exploring Canva's Design Tools and Features (2 hours) 3. Creating Your First Design: Poster or Social Media Graphic (2 hours)	5 Hrs
II	**Module 2: Design Principles and Techniques (5 hours)** 1. Understanding Design Principles: Composition, Color, Typography (1 hour) 2. Applying Design Techniques in Canva (2 hours) 3. Creating Visual Hierarchy and Balance in Designs (1 hour) 4. Incorporating Images and Illustrations Effectively (1 hour)	5 Hrs
III	**Module 3: Advanced Design Techniques (5 hours)** 1. Advanced Text Effects and Typography (1 hour) 2. Working with Layers and Grouping Objects (1 hour) 3. Using Canva Templates and Customizing Them (2 hours) 4. Designing Infographics and Presentations (1 hour)	5 Hrs

E-contents:

1. **Canva Design School:** Canva offers a comprehensive Design School with tutorials, articles, and courses covering various design topics, from basic design principles to advanced techniques. You can access it here: https://www.canva.com/designschool/

2. **YouTube Tutorials:** Many content creators share tutorials and tips for using Canva on YouTube. You can find tutorials ranging from beginner to advanced levels, covering different aspects of design and Canva features.
3. **Canva's YouTube Channel:** Canva's official YouTube channel provides video tutorials, tips, and inspiration for using Canva effectively. You can find a variety of videos covering different design topics and techniques.
4. **Community Forums and Groups:** Joining online communities like Canva's Facebook groups or Reddit forums can be a great way to learn from others, ask questions, and get feedback on your designs.

SEC-2 A: Practical based on SEC-1A (HTML & CSS)

Total Credits : 01   Total Contact Hours : 30 Hrs
Maximum Marks : 50

1	Write a HTML program to demonstrate the use of Heading tags.
2	Write a HTML program to demonstrate the use of Heading tags.
3	Write a HTML program to demonstrate the use of text formatting tags.
4	Write a HTML program to demonstrate use of list tags and its attributes.
5	Write a HTML program to demonstrate use of anchor tag.
6	Write a HTML program to demonstrate the use of table tags and its attributes.
7	Write a HTML program to demonstrate the use of form tags and its attributes.
8	Write a HTML program to demonstrate the use of internal CSS.
9	Write a HTML program to demonstrate the use external CSS.
10	Write a HTML program to demonstrate the use of inline CSS.

SEC-2: Lab Course -I (Based on SEC-1B)

Total Credits: 01

Maximum Marks : 50   Total Contact Hours: 30 Hrs

Lab Session No.	Lab Title/Topic
1	**Lab 1: Introduction to Canva Interface** Objective: Understand the basic layout and features of Canva for design creation. Task: Familiarize students with the Canva interface, including tools, menus, and workspace organization.
2	**Lab 2: Exploring Canva's Design Tools and Features:** Objective: Gain proficiency in using various design tools and features in Canva. Task: Explore Canva's design tools such as text, shapes, backgrounds, and effects to create simple designs.
3	**Lab 3: Creating Your First Design: Poster or Social Media Graphic:** Objective: Apply basic design principles to create visually appealing posters or social media graphics. Task: Creating their first design project using Canva, focusing on layout, color, and content.
4	**Lab 4: Understanding Design Principles:** Objective: Learn fundamental design principles including composition, color theory, and typography. Task: Discuss and analyze examples of design compositions and typography, and their impact on visual communication.
5	**Lab 5: Applying Design Techniques in Canva:** Objective: Apply design techniques learned to create visually engaging designs in Canva. Task: Create designs in Canva using principles of balance, contrast, alignment, and proximity.
6	**Lab 6: Creating Visual Hierarchy and Balance in Designs:** Objective: Understand how to create visual hierarchy and balance in design compositions. Task: Design projects focusing on establishing visual hierarchy through font size, color contrast, and element placement.
7	**Lab 7: Incorporating Images and Illustrations Effectively:** Objective: Learn how to use images and illustrations to enhance design compositions. Task: Experiment with incorporating images and illustrations into design projects.
8	**Lab 8: Advanced Text Effects and Typography:** Objective: Explore advanced text effects and typography techniques in Canva. Task: Experiment with typography effects such as shadows, gradients, and text wrapping to create visually dynamic designs.
9	**Lab 9: Working with Layers and Grouping Objects:** Objective: Understand the concept of layers and object grouping for efficient design management. Task: Practice working with layers and grouping objects in Canva to organize design elements effectively.

10	**Lab 10: Using Canva Templates and Customizing Them:** Objective: Learn how to utilize Canva templates and customize them for specific design needs. Task: Explore Canva's template library, select a template, and customize it according to design requirements.
11	**Lab 11: Designing Infographics and Presentations:** Objective: Develop skills in creating infographics and presentations using Canva. Task: Design infographics and presentations in Canva, focusing on visual storytelling and information presentation.
12	**Lab 12: Advanced Design Projects:** Objective: Apply advanced design techniques learned to create complex design projects. Task: Work on advanced design projects such as branding materials, marketing collateral, or digital publications using Canva.
13	**Lab 13: Collaborative Design Project:** Objective: Collaborate with peers to create a design project, incorporating collective ideas and feedback. Task: Collaborate with classmates on a design project, sharing ideas, critiques, and contributions using Canva's collaborative features.
14	**Lab 14: Design Critique and Feedback Session:** Objective: Evaluate and provide constructive feedback on design projects created by peers. Task: Participate in a design critique session, offering feedback on peers' design projects and receiving feedback on your own.
15	**Lab 15: Portfolio Development and Presentation:** Objective: Compile and present a portfolio showcasing the design projects completed throughout the course. Task: Create a portfolio showcasing select design projects created in Canva, and present it to the class, highlighting design process, rationale, and outcomes.

	This course will be available for the students from other faculty	

GE/OE-1: Cyber Security

Total Credits: 02

Maximum Marks : 50

Total Contact Hours: 30 Hrs

Learning Objectives of the Course:

    1. Make the student will understand Cyber Security, Data Privacy and Data Protection.

    2. Students will acquainted with the Types of Security threats.

    3. Make the student will understand Ethical Hacking, Email security: web authentication.

Course Outcomes (COs) :

After completion of the course, students will be able to –

    1. Understands the concept and process of cyber security.

    2. Understands the Online Dispute Resolution.

    3. Knows the Network & Mobile Security Techniques

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Cyber Security: Meaning and Scope Computer & Cyber Security: Types of Attacks, Types of Security threats, Hacking Techniques	**15 Hrs**
II	Database Security; Operating System Security 2. Advance Computers, Network & Mobile Security Techniques 3. Security issues: debit cards, credit cards, ATM, Secure Electronic Transactions	**15 Hrs**

Reference Books:

    1. Information Security and Cyber Laws, by Pankaj Sharma. S.K. Kataria & Sons

    2. Fundamentals of Cyber Security, by Bhushan, Rathore, Jamshed, BPB

    3. Cyber-security for Beginners, by Raef Meeuwisse. Cyber Simplicity Ltd

    4. A Handbook of E-commerce, by Nidhi Dhawan, Sun India Publications

    5. E-Commerce in India: Economic and Legal Perspectives, Pralok Gupta, Sage Publications India Pvt. Ltd.

B. Sc.

Computer Science(Major)

Semester - II

M1-DSC-7 : Programming in C

Total Credits : 02	Total Contact Hours : 30 Hrs
Maximum Marks : 50	

Learning Objectives of the Course:

      iv) To learn basic features
      v) To learn different decision making and looping statements
      vi) To understand the concepts of array
      vii) To learn modular applications in C using functions
      viii)   To understand concepts of pointers and structures

Course Outcomes (COs) :

After completion of the course, students will be able to –

      vi) Implement basic C programs
      vii) Develop and implement conditional and iterative statements
      viii)   Implement different types of arrays
      ix) Develop and implement modular applications in C using functions
      x)   Implement structure and pointers

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Introduction-** History of C language, Features, Character set, C Token, Identifier & Keywords, Variables, Constant & its types, various Operators, **Data Types -** int, char, float, double.	**10 Hrs**
II	**Structure of C Program -** I/O statements, Compilation & Execution of C program in Geany IDE C compiler /Turbo c compiler, Escape sequence characters, Decision making and looping Statements, ? : Operator, Loop interruption statements.	**10 Hrs**
III	**Arrays -** Introduction, Declaration & initialization, Accessing array elements, Types of arrays, **Function -** Introduction, defining function, Arguments, Function prototype, function calling & Returning value from function, Call by Value & Call by Reference, Recursion **Pointers -**Introduction, address (&) and indirection (*) Operators, Declaration and initialization of pointers, **Structure-** Introduction, Declaration & initializing structure, Accessing structure members, Nested structures.	**10 Hrs**

Reference Books:

1 Let us C : Y.P. Kanetkar [bpb publication]
2 Programming in C : E. Balagurusamy [Tata macgraw hill]
3 Spirit of "C" : Mullish Cooper

	M1-DSC-10: Practical based on DSC-7 (Programming in C)	
Total Credits : 02		Total Contact Hours : 60 Hrs
Maximum Marks : 50		

List of experiments to be carried out based on the course DSC-7. Execute the programs on Turbo C compiler/ Geany IDE, etc.

1	Program to find average of three numbers
2	Program to find area of circle
3	Program to Find largest number from two numbers
4	Program to check entered number is positive, negative or zero
5	Program to demonstrate switch case statement
6	Program to print odd numbers from 1 to N
7	Program to demonstrate nested loop
8	Program to check entered number is even or odd
9	Program to print the Fibonacci Series
10	Program to demonstrate one dimensional array
11	Program to demonstrate two dimensional array
12	Program to find factorial of given number using function
13	Program for Swapping of numbers by using call by reference
14	Program to create structure student
15	Program to demonstrate pointers

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VSC-1A: JavaScript

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Total Credits : 01	Total Contact Hours : 15 Hrs
Maximum Marks : 50	

Learning Objectives of the Course:

    i)   Implementation of advance Professionalism for project management, interpersonal skills and teamwork.

    ii)   Problem finding and solution with software.

    iii)   Competency for higher studies and employability.

    iv)   A commitment to lifelong learning and keeping up with evolving technologies....

Course Outcomes (COs) :
After completion of the course, students will be able to -

    i)   Ability to understand fundamentals of JavaScript

    ii)   Proficiency in developing interactive and dynamic web applications.

    iii)   Understanding of basic functions in JavaScript

    iv)   Understand Internet and web technology.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to JavaScript: Overview of JavaScript, definition, features of JavaScript, Applications of JavaScript. JavaScript Variables and datatypes: JavaScript \<script\> tag, what is variables, global variables, what is datatype: Primitive data type and non-primitive (reference) data types	05 Hrs
II	Operators in JavaScript: Arithmetic Operators, Comparison (Relational) Operators, Bitwise Operators, Logical Operators, Assignment Operators, Special Operators JavaScript control statement: if , if else, if else if, switch Introduction to Loops: for loop, while loop, do-while loop, for-in loop.	05 Hrs
III	Functions: What is Function, Advantage of JavaScript function, JavaScript Function Syntax, JavaScript Function Arguments Built-in functions in JavaScript: Date(), getDate(), getDay(), min(), max(), round(), alert() Methods in JavaScript: getElementbyID, getElementsByClassName() Create and Access External JavaScript	05 Hrs

Reference Books:

1. A Smarter Way to Learn JavaScript by Mark Myers
2. JavaScript: The Definitive Guide by David Flanagan
3. JavaScript and jQuery: Interactive Front-End Web Development by Jon Duckett
4. Head First JavaScript Programming: A Brain-Friendly Guide by Elisabeth Robson.

VSC-2A- Practical Based on VSC-1A (JavaScript)

Total Credits :   01   Total Contact Hours : 30 Hrs
Maximum Marks : 50

List of practical to be conducted in Laboratories :
Demonstrate following concepts of JavaScript-

1)   Creating a JavaScript-enabled page
2)   Using the JavaScript alert() method and prompt() method
3)   Using the JavaScript document.write() method
4)   Storing user data in a JavaScript variable
5)   Assigning and adding variables in JavaScript
6)   Creating a user-defined function in JavaScript
7)   Using functions, arguments and return values in JavaScript
8)   Calling a function from within another function in JavaScript
9)   Using if, if else, if else if, switch
10)   Using for loop, while loop, do-while loop, for-in loop.
11)   Writing content to new windows
12)   Assigning properties to a remote document dynamically
13)   Applying String methods to text
14)   Using the JavaScript Date(), getDate(), getDay(), min(), max(), round()
15)   Using the JavaScript getElementbyID, getElementsByClassName()

Total Credits : 01

Total Contact Hours : 15 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

i) To get knowledge of working of a PC
ii) To get knowledge of basics of PC Maintenance and safety measures.
iii) To get knowledge of Motherboard basics, BIOS, Different Cards.
iv) To get knowledge of PC Assembly

Course Outcomes (COs) :
After completion of the course, students will be able to -

i) Perform Basic Trouble shooting.
ii) Installation of Operating System, and device drivers.
iii)Basic maintenance like Anti virus installation and updating and system scanning
iv)Upgrading a PC
v) Able to assemble a Desktop PC

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	The Four Main Functions of Computing. PC Hardware Components. PC Workspaces and Tools, Environmental and Safety Concerns. SMPS and its Types	**05 Hrs**
II	Motherboards and Central Processing Units, Types of Motherboards, Motherboard Form Factors, Mother Board Components : Central Processing Unit (CPU) and Processor Socket or Slot, Motherboard Buses, Chipsets, Expansion Slots, Memory Slots, Connectors	**05 Hrs**
III	Types of Peripheral Devices, Device Drivers, Types of RAMs (DDR2, DDR4,..), Types of Hard Drives (HDD, SSD,..) Graphics Cards: Introduction, working and types. Operating System Installation. Antivirus types.	**05 Hrs**

Reference Books:

1. Wiley Pathways PC Hardware Essentials Project Manual by Groth, David ; Gilster, Ron, Liberty Lake, Washington ; Polo, Russel

2. Troubleshooting, Maintaining & Repairing PCs by Stephen J. Bigelow, Tata McGraw-Hill.
The Complete PC Upgrade and Maintenance Guide by Mark Minasi, BPB Publication

VSC-2B- Practical Based on VSC-2B (Computer Hardware)	
Total Credits : 01 Maximum Marks : 50	Total Contact Hours : 30 Hrs

List of practical to be conducted in Laboratories :

1) Practical to perform different Preventive Maintenance done for a Desktop PC
2) Practical to understand working of SMPS and trouble shooting of SMPS
3) Motherboard fitting in Cabinet, Fitting processor, RAM and other cards.
4) Fitting SMPS Disk Drives, making its connections on motherboard.
5) Entering into BIOS and exploring its various options. Setting Boot Priorities, enabling network booting.
6) Installation of Operating system Windows/Linux
7) Connecting various Peripherals to Computer and installing their drivers.
8) Installation of Antivirus, updating it, making different settings
9) Network settings: putting PC on DHCP, setting static IP, configuring internet gateway for multiple internet connections, , connection to Wi-Fi network.
10) Creating users and giving rights to it. Sharing of resources like printer, folders and giving access rights.
11) Performing PC maintenance activity like Disk cleanup, disk defragmentation, disk configuration etc.
12) Connecting PC to Projector and making its settings.

GE/OE-2: E-Commerce and E-Contracts

Total Credits: 02
Maximum Marks : 50

Total Contact Hours: 30 Hrs

Learning Objectives of the Course:

1. To make the student understand the E-commerce and its application.
2. To make the student understand the Electronic Contract..

Course Outcomes (COs) :

After completion of the course, students will be able to –

1. Understand issues in e-commerce.
5. Understand E-Commerce and E-Business-Models and Approaches.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Online Business: Definition of E-Commerce, Types of E-Commerce, Important issues in Global E-commerce. Laws relating to E-Commerce, Intellectual Property Rights, International Trade Law	**15 Hrs**
II	E-banking, Online Payment gateways, Electronic Cheques in India. Electronic Contract: Meaning, Types and Formation of e-contracts	**15 Hrs**

Reference Books:

1. Information Security and Cyber Laws, by Pankaj Sharma. S.K. Kataria & Sons
2. Fundamentals of Cyber Security, by Bhushan, Rathore, Jamshed, BPB
3. Cyber-security for Beginners, by Raef Meeuwisse. Cyber Simplicity Ltd
4. A Handbook of E-commerce, by Nidhi Dhawan, Sun India Publications
5. E-Commerce in India: Economic and Legal Perspectives, Pralok Gupta, Sage Publications India Pvt. Ltd.