DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
CHHATRAPATI SAMBHAJINAGAR.

CIRCULAR NO.SU/ Sci & Tech./B.Voc/NEP/16/2024.

It is hereby inform to all concerned that, the Revised syllabus prepared by the Ad-hoc Board and recommended by the Dean, Faculty of Science & Technology **Academic Council at its meeting held on 05 June, 2024 has accepted the following Revised syllabus of Bachelor of Vocation 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	Subject Name	Semester
1.	B.Voc in IT Skills and Software Development (Revised)	I & II

This is effective from the Academic Year 2024-25 onwards under the Faculty of Science & Technology.

This curriculum is also available on the University website www.bamu.ac.in.

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

University campus,
Chhatrapati Sambhajinagar-431 004.
Ref. No.SU/B.voc./syllabus./2024-25/ 1777-85
Date: 26.06.2024

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Deputy Registrar,
Academic Section.
(Syllabus)

Copy forwarded with compliments to :-

1] The Principals, affiliated concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.

2] **The Director,** University Network & Information Centre, UNIC, with **a request to upload the curriculum along with 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.Voc Unit] Examination Branch, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar.
3] The Programmer, [Computer Unit-1] Examination Branch, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar.
4] The Programmer, [Computer Unit-2] Examination Branch, 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

Three Year

B. Voc. Degree Program

Course Structure

(Revised)

(AS PER NEP-2020)

Subject (Major):

IT Skills and Software Development

(Pattern 2024)

Effective from 2024-25

The National Education Policy (NEP) 2020 has introduced significant reforms aimed at transforming the education landscape in India. Here's how NEP 2020 intersects with skill education:

1. **Multidisciplinary Education**: NEP 2020 emphasizes multidisciplinary education, encouraging students to pursue a broad range of subjects and skills. This approach promotes flexibility and enables students to develop diverse skill sets tailored to their interests and career goals.

2. **Holistic Development**: The policy advocates for holistic development, which includes not only academic learning but also social, emotional, and vocational skills. This holistic approach ensures that students are well-rounded individuals equipped to navigate various aspects of life and work.

3. **Vocational Education and Internships**: NEP 2020 places a strong emphasis on vocational education, integrating it into mainstream curriculum from an early age. The policy encourages hands-on learning experiences, internships, and apprenticeships to provide practical skills and real-world exposure to students.

4. **Focus on Critical Thinking and Problem-Solving**: NEP 2020 prioritizes the development of critical thinking, creativity, and problem-solving skills. These skills are essential for innovation and adaptability in a rapidly changing world and are integrated across all levels of education.

5. **Flexible Learning Pathways**: The policy promotes flexible learning pathways, allowing students to choose their own educational trajectories based on their interests, aptitudes, and aspirations. This flexibility enables students to explore diverse skill areas and tailor their education to suit their individual needs.

6. **Teacher Training and Professional Development**: NEP 2020 recognizes the importance of teacher training and professional development in enhancing the quality of education. The policy emphasizes continuous learning for teachers, equipping them with the knowledge and skills necessary to effectively nurture students' talents and abilities.

7. **Digital Education and Technology Integration**: The policy advocates for the integration of digital technology in education to enhance access, equity, and quality. Digital platforms and tools are leveraged to facilitate interactive learning experiences, skill development, and personalized instruction.

By aligning with the principles and objectives of NEP 2020, skill education in India is poised to undergo a transformative shift, fostering innovation, equity, inclusivity, and excellence in education. These contexts have remained as mainframe while developing this curriculum.

The University has adapted Outcome-based education (OBE) since 2017. OBE is widely adopted in educational systems globally due to student centric advantages. OBE provides clear and measurable learning objectives that help students focus and stay motivated. It emphasizes real-world skills, bridging the gap between academia and the workforce. Customized learning paths are possible, accommodating different learning styles and promoting inclusivity. OBE focuses on mastery and competency rather than seat time, encouraging deeper learning and retention of

knowledge. Continuous improvement is encouraged through ongoing assessment and feedback. OBE promotes accountability and transparency, allowing stakeholders to monitor progress and evaluate educational programs. It equips students with skills needed for the globalized economy, fostering critical thinking and collaboration. Lifelong learning skills like self-directed learning and adaptability are developed, creating a culture of continuous improvement. Overall, OBE offers a holistic approach to education, emphasizing relevant skills, competencies, and attitudes crucial for success in today's ever-changing world.

The authorities of Dr. Babasaheb Ambedkar Marathwada University, CHHATRAPATI SAMBHAJINAGAR (M.S.), remaining aligned to accreditation standards of National Assessment and Accreditation Council, decided to opt for National Education and Policy and Outcomes Based Education (OBE). As the part of the decision, different meetings, workshops and presentations were held at the campus of university.

This document is the outcome such meetings and workshops held at university level and department level. The detailed document is designed and the existing curriculum of the department has been meticulously analysed from the standpoint of the immediate and long-time requirements of manufacturing and process industries, and transformed in to the framework of NEP with OBE. This is the first step towards the implementation of NEP with OBE in the university departments and affiliated colleges. The document will serve all stakeholders in the effective implementation of the curriculum. The OBE is continuous process for quality enhancement and it will go a long way in order to enhance the competencies and employability of the graduates/Post-graduates of the university departments and affiliated colleges.

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 Vocation (B. VOC.) 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 Vocation (B. VOC.) 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 Lab Course 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 Lab Course 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 Vocation (B. Voc.) 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 Vocation (B. Voc.) 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 Vocation (B. Voc.) 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.

In light of aforesaid, Dr. Babasaheb Ambedkar Marathwada University hereby proposes to offer a three years industry embedded Bachelor of Vocation program (B. Voc.) in IT Skills and Software Development. The curriculum design of this program is undertaken with following considerations

Although there has been remarkable progress in all sectors of education in last couple of decades, the less regulated area of the education sector-vocational training—seems to have lost its significance/importance. This has led to the widening gap between the supply and demand for skilled manpower across IT, Software and IT enabled organizations.

This program is designed to produce a skilled manpower so that wide variety of options in different sectors of IT would be available and it will improve the opportunities for the unemployed youths in the country in both the private and public sectors.

Structure of Three Years Bachelor of Vocation (B. Voc.)

Subject (Major): IT Skills and Software Development

B. Voc. 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	IT/DSC/T/100	IT Fundamentals and Computer System architecture	2		2		2+2 = 4
	IT/DSC/P/126	Practical based on IT/DSC/T/100		4		2	
Major (Core) M2 Mandatory	IT/DSC/T/101	Programming Methodology using C++	2		2		2+2 = 4
	IT/DSC/P/127	Practical based on IT/DSC/T/101		4		2	
Major (Core) M3 Mandatory	IT/DSC/T/102	Database Management System using SQL	2		2		2+2 = 4
	IT/DSC/P/128	Practical based on IT/DSC/T/102		4		2	
Generic / Open Elective (GE/OE) (Choose any one from pool of courses) **It should be chosen compulsorily from the faculty other than that of Major**	IT/GE/OE/T/100	To be chosen from other faculty	2		2		2
SEC (Skill Enhancement Courses) (Choose any one from pool of courses)	IT/SEC/T/100 IT/SEC/T/101	1) Web Designing 2) Basic Animation with Scratch	1		1		2
	IT/SEC/P/126 IT/SEC/P/127	Practicals based on IT/SEC/T/100 IT/SEC/T/101		2		1	
AEC, VEC, IKS	IT/AEC/T/100	English (Common for all the faculty)	2		2		2+2 =4
	IT/IKS/T/101	Choose any one from pool of Courses	2		2		
OJT/ FP/CEP/CC/RP	IT/CC/P/126	Health and Wellness (Common for all the faculty)		4		2	2
			13	**18**	**13**	**09**	**22**

B. Voc. First Year: 2nd Semester

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theory	Practical	Theory	Practical	
Major (Core) M4 Mandatory	IT/DSC/T/150	Financial Accounting Using Tally ERP9	2		2		2+2 = 4
	IT/DSC/P/176	Practical based on IT/DSC/T/150		4		2	
Major (Core) M5 Mandatory	IT/DSC/T/151	Python Programming-I	2		2		2+2 = 4
	IT/DSC/P/177	Practical based on IT/DSC/T/151		4		2	
Major (Core) M6 Mandatory	IT/DSC/T/152	Hardware Basics CCTV and Projector	2		2		2+2 = 4
	IT/DSC/P/178	Practical based on IT/DSC/T/152		4		2	
Generic / Open Elective (GE/OE) (Choose any one from pool of courses) **It should be chosen compulsorily from the faculty other than that of Major**	IT/GE/OE/T/150	To be chosen from other faculty	2		2		2
VSC (Vocational Skill Courses) (Choose any one from pool of courses)	IT/VSC/T/150 IT/VSC/T/151	1) Web Designing using Bootstrap 2) Graphic design using Canva	1		1		2
	IT/VSC/P/176 IT/VSC/P/177	Practical based on IT/VSC/T/150 IT/VSC/T/151		2		1	
AEC, VEC, IKS	IT/AEC/T/150	Modern Indian Language(MIL-1) (Choose any one from pool of language Courses)	2		2		2+2 =4
	IT/IKS/T/151	Constitution of India (Common for all the faculty)	2		2		
OJT/ FP/CEP/CC/RP	IT/CC/P/176	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							

IT/GE/OE/T/100: Cyber Security (This Course will be available for the students from other faculty)
IT/GE/OE/T/150: E-Commerce and E-Contracts (This Course will be available for the students from other faculty)

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

1) **Major** (Core) subject are mandatory.
IT/DSC/T/100 : This is a 2 credit theory course corresponding to Major (core) subject M1
IT/DSC/P/126: This is a 2 credit practical course based on IT/DSC/T/100
IT/DSC/T/101 : This is a 2 credit theory course corresponding to Major (core) subject M2
IT/DSC/P/127: This is a 2 credit practical course based on ITDSC-3
IT/DSC/T/102 : This is a 2 credit theory course corresponding to Major (core) subject M3
IT/DSC/P/128: This is a 2 credit practical course based on ITDSC-5
IT/DSC/T/150: This is a 2 credit theory course corresponding to Major (core) subject M4
IT/DSC/P/176: This is a 2 credit practical course based on ITDSC-7
IT/DSC/T/151: This is a 2 credit theory course corresponding to Major (core) subject M5
IT/DSC/P/177: This is a 2 credit practical course based on ITDSC-9
IT/DSC/T/152: This is a 2 credit theory course corresponding to Major (core) subject M6
IT/DSC/P/178: This is a 2 credit practical course based on ITDSC-11

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

IT/GE/OE/T/100: This is a 2 credit theory course should be chosen compulsorily from faculty other than that of Major.
IT/GE/OE/T/150: 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.
IT/SEC/T/100 or IT/SEC/T/101: This is a 1 credit theory course to enhance the technical skills of the students in specific area.
IT/SEC/P/126 or IT/SEC/P/127: This is a 1 credit practical course based on IT/SEC/T/100 or IT/SEC/T/101.

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.

IT/VSC/T/150 or IT/VSC/T/151: This is a 1 credit theory course based Hands on Training corresponding to Major (core) subject.
IT/VSC/P/176 or IT/VSC/P/177: This is a 1 credit practical course based on IT/VSC/T/150 or IT/VSC/T/151

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

IT/AEC/T/100: English
This is a 2 credit theory course based on linguistic proficiency. It will be common for all the faculty.

IT/AEC/T/150: Modern Indian Language MIL-1 (Marathi/ Hindi…)
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.

IT/IKS/T/101 : 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.

IT/VEC/T/151 : 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.

IT/CC/P/126 : Health and Wellness
This is a 2 credit practical course based on Co-curricular activities. It will be common for all the faculty

IT/CC/P/176 : 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

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) In the beginning of second year, students will have to select / declare choice of one minor subject from three options Mn-1, Mn-2 and Mn-3
3) Once the students finalize their Minor Subject in the beginning of the second year of the programme, they shall pursue their further education in that particular subject as their Minor subjects. Therefore, from second year onwards curriculum of Minor subjects shall be different.
4) Students are required to select Minor subject from other discipline of the same faculty
5) 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.
6) Vocational Skill Courses and Skill Enhancement Courses (VSC and SEC) shall be related to the Major subject
7) 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 Vocation Curriculum under the National Education Policy 2020:

1. **Mastery of Discipline-Specific Knowledge**: Graduates of the Bachelor of Vocation 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 Vocation (B.Voc.) 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. The citizenship and society:** Apply broad understanding of ethical and professional skill in Trade/Skill Domains in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues.

- **PO2. Environment and sustainability**: Apply broad understanding of impact of Trade/Skill Domains in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development.

- **PO3. Ethics:** Apply ability to develop sustainable practical solutions for Trade/Skill Domains 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 Trade/Skill Domains 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 and finance**: Demonstrate knowledge and understanding of the first principles of Trade/Skill Domains 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.

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):

(Programme specific outcomes are discipline / major specific. Different major will have different PSOs. **Ad-Hoc Board is expected to write PSOs specific to respective B.VOC program.**

PSO1. Apply broad based fundamental knowledge of Computer Science and Information Technology for the solution of IT and IT allied industry.
PSO2. Analyse and recommend the appropriate IT infrastructure required for the implementation of a business project.
PSO3. Identify IT related problems at varied complexity and analyze the same to formulate/ develop substantiated conclusion using software Engineering Models.
PSO4. To provide knowledge about computing principles and business practices employed as software solutions in industry
PSO5. To engage in professional development in the fields of information technology.
POS6. Get basic and advanced knowledge of PC hardware and computer networking.

Eligibility:

A candidate will be eligible to join 1st semester of B. Voc. IT Skills and Software Development course, if he/she has passed 10+2 examination from any Stream(HSC Arts, Commerce, Science) or 10+2 vocational from any stream (HSVC/ITI) of recognized Board/university, or any other examination recognized as equivalent thereto.

Exit Options:

The programme allows exit of a student in an intermediate stage, on successful employment. Scopes will be there for further continuation of study. The other wise exit options will be as follows-

Exit Point	*Duration*	*Diploma / Degree to be Offered*
First exit	After 1 yr.	Certificate in Vocation
Second exit	After 2 yrs.	Diploma in Vocation
Third exit	After 3 yrs.	Bachelor in Vocation (B. Voc.)

B. Voc. ITSSD

Semester - I

IT/DSC/T/100: IT Fundamentals and Computer System Architecture

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

Perquisite: There are no perquisites for this course

Learning Objectives of the Course:

i) Ability to identify and explain computer system components, including hardware and software.
ii) Get idea about structure of memory and how data is stored in it
iii) Get basic knowledge of Digital Electronics like Gates and flip-flop
iv) Get basic knowledge of microprocessor and its architecture.

Course Outcomes (COs) :

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

i) Demonstrate a thorough understanding of computer hardware and software components, their functions, and interactions within a computing system.
ii) Able to perform Conversion of different number systems.
iii) Analyze different logical operations
iv) Understands internal architecture of a computer system

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Module 1: Introduction to Computer Fundamentals** • **Introduction to Computers and Their Evolution** Definition and historical background of computers, Evolution from early computing devices to modern computers • **Computer Hardware Components** Central Processing Unit (CPU), Memory (RAM), Storage Devices (Hard Disk Drive, Solid State Drive), Input Devices (Keyboard, Mouse, Touchpad), Output Devices (Monitor, Printer) • **Operating Systems** Functions of an operating system, Types of operating systems (Windows, macOS, Linux) • **Computer Software** System Software (Operating Systems), Application Software (Word Processors, Spreadsheets, Presentation Software) • **Computer Networks** Basics of Networking, Introduction to the Internet and World Wide Web	**10 Hrs**
II	**Module 2: Digital Electronics Basics** • **Number system** Binary Number System, Octal number system, Decimal Number System & Hexadecimal number system, Decimal to Binary conversion, Binary to Decimal Conversion, Hexadecimal to binary, Binary to Hexadecimal, 1's complement, 2'scomplement • **Logic gates** AND, OR, NOT, Ex-OR, NAND, NOR gates as a universal building blocks. Logic diagram, Boolean expression and truth tables of each gates. • **Flip-flops** Introduction of Flip Flops, RS Flip Flop, JK Flip flops, D Flip Flop, T Flip Flop	**10 Hrs**

III	**Module 3: 8086 Microprocessor** **Introduction to Microprocessor and Microcomputer** • Historical background • Microprocessor based personal computer system • Computer data formats **8086 Hardware specification** • Microcomputer structure and operation • 8086 internal architecture , • Pin out and Pin Connections	**10 Hrs**

Text Books:

1. Fundamentals of Computers, Rajaraman PHI Learning Private Limited
2. Fundamentals of Information Technology By Chetan Srivastava, Kalyani Publishers
3. Digital Electronics and Micro-Computers – R.K.Gaur , Dhanpat Rai Publication
4. The Intel Microprocessors: Architecture, programming and interfacing – By Barry B. Brey

Reference Books:

1. Miller, Michael. "Computer Basics Absolute Beginner's Guide, Windows 10 Edition", Pearson, 2021. [Module 1: Likely covers chapters on Introduction to Computers, Hardware Components, Software Applications, and Basic Troubleshooting.]
2. Digital Electronics and Logic Design – N.G.Palan, Technova Publication
3. Microprocessors and Interfacing : Douglas Hall.

IT/DSC/P/126 : Lab Course -I (Based on DCS-1)

Total Credits: 02
Maximum Marks : 50 **Total Contact Hours: 60 Hrs**

Lab Session No.	Lab Title/Topic
	Practical based on Digital Electronic The practical should be done on kit for AND, OR , NOT, NAND, NOR , X-OR and X-Nor gate and 8086 microprocessor (**If kit not available use the software simulation for practical**)
1	Testing of AND, OR and NOT Gate.
2	Testing of NAND and NOR gate
3	Testing of XOR and X-NOR gate
4	Practical for SR Flip flop
5	Practical for JK Flip Flop
6	Practical based on D-Flip flops
7	Practical based on T Flip Flop
8	Assembly language program of 8086 microprocessor to understand data movement instruction.
9	Addition of two 8-bit/16-bit numbers with programs based on direct memory addressing mode of 8086.
10	Addition of two 8-bit/16 bit numbers with programs based on indirect memory addressing mode of 8086.
11	Subtraction of two 8-bit numbers with programs based on direct addressing mode of 8086.
12	Subtraction of two 8-bit numbers with programs based on direct addressing mode of 8086.

IT/DSC/T/101: Programming Methodology using C++

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

Learning Objectives of the Course:

i) Learn to develop simple algorithms and flow charts to solve a problem.
ii) Develop problem solving skills coupled with top down design principles.
iii) Learn about the strategies of writing efficient and well-structured computer algorithms/programs.
iv) Introduces Object Oriented Programming concepts using the C++ language.

v) Develop the skills for formulating iterative solutions to a problem.
vi) Acquire foundational knowledge of C++ programming concepts, including syntax, data types, operators, and control structures.
vii) To understand the concepts of array

Course Outcomes (COs) :

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

i) Develop, compile, execute, and debug C++ programs proficiently, thereby demonstrating their mastery of the programming language.
ii) Apply problem-solving techniques effectively to various programming tasks, including algorithm design, flowchart interpretation, and implementation in C++.
iii) Understand program structure, control flow mechanisms, and data types in C++, enabling them to design and implement efficient and structured programs.
iv) Demonstrate strong algorithmic thinking skills, allowing them to formulate and implement algorithms for solving a wide range of computational problems using the C++ programming language.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Introduction To Programming Environment and Techniques** Introduction to Programming, Definition of program and programmer, features of good programming language, Bugs and Debugging, Programming approaches: Structural Programming, Modular Designing, Top Down Designing, Bottom Up Designing, Object Oriented Programming **Algorithms in Programming:** Introduction to Algorithms, Characteristics of Good Algorithms, Algorithm Design Techniques, Common Algorithms and Problem-Solving Techniques, Examples and Practice Exercises **Flowcharts in Programming:** Introduction to Flowcharts, Symbols and Conventions used in Flowcharts, Flowchart Designing Techniques, Importance of Flowcharts in Programming, Examples and Practice Exercises	**10 Hrs**

II	**Module II: Data Types and Program Structure** **Data Types:** Data Types: int, char, float, double, Declaration & Initialization, Type modifiers: long, short, signed & unsigned. **C++ Program & I/O statements:** Structure of C++ Program, Compilation & Execution of C++ program, I/O Introduction, Formatted Input/Output functions: Escape sequence characters, Library functions: General & Maths	**10 Hrs**
III	**Module III: Control Flow and Iterative Statements** **Control and Iterative Statements:** Simple if, nested if, if-else, else-if ladder, Switch-case statement, The conditional expression (? : operator), while and do-while loop, for loop, break & continue statement, goto statement	**10 Hrs**

Text Books:

1. Programming Logic and Design, Comprehensive By Joyce Farrell
2. Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffman, Pearson, 2015.
3. C++: The Complete Reference- Schildt, McGraw-Hill Education (India)

Reference Books:

1. Object Oriented Programming with C++ by E. Balagurusamy, McGraw-Hill Education (India).

E-contents:

1. Websites like GeeksforGeeks (https://www.geeksforgeeks.org/) and TutorialsPoint (https://www.tutorialspoint.com/) offer comprehensive tutorials on flowcharts, algorithms, and data structures.
2. YouTube channels such as CS Dojo (https://www.youtube.com/user/CSDojo) and freeCodeCamp.org (https://www.youtube.com/channel/UC8butISFwT-Wl7EV0hUK0BQ) provide video tutorials on these topics.

IT/DSC/P/127: Lab Course -II (Based on DCS-3)

Total Credits: 02
Maximum Marks : 50
Total Contact Hours: 60 Hrs

Lab Session No.	Lab Title/Topic
1	Write a C++ program to find the area of a circle. Start by drafting the algorithm to compute the area, visually represent the logic through a flowchart, and conclude by implementing the solution in C++.
2	Develop a C++ program to calculate the average of three numbers. Begin by outlining the algorithm to compute the average, create a flowchart to illustrate the process, and finalize the solution in C++.
3	Create a C++ program to find the maximum among two numbers using if-else statements. Begin by formulating the decision-making algorithm, visually represent the logic with a flowchart, and conclude by implementing the solution in C++.
4	Write a C++ program to determine whether an entered number is even or odd using if-else statements. Start by outlining the decision-making process, create a flowchart to depict the logic, and finalize the solution in C++.
5	Develop a C++ program to determine whether an entered number is positive, negative, or zero using else-if ladder. Begin by formulating the decision-making algorithm, visually represent the logic with a flowchart, and conclude by implementing the solution in C++.
6	Design a C++ program to print the grade of a student based on the percentage using else-if ladder. Start by outlining the grading algorithm, create a flowchart to illustrate the grading process, and finalize the solution in C++.
7	Create a C++ program to print the weekday based on a given number using switch-case statements. Begin by formulating the decision-making algorithm, visually represent the logic with a flowchart, and conclude by implementing the solution in C++.
8	Write a C++ program to check whether an entered character is a vowel or not using switch-case statements. Start by outlining the decision-making process, create a flowchart to depict the logic, and finalize the solution in C++.
9	Develop a C++ program to find the factorial of a given number using a while loop. Begin by outlining the iterative algorithm, visually represent the process with a flowchart, and conclude by implementing the solution in C++.
10	Design a C++ program to find the sum of the first 10 natural numbers using a while loop. Start by formulating the iterative algorithm, create a flowchart to illustrate the process, and finalize the solution in C++.
11	Create a C++ program to print odd numbers from 1 to N using a do-while loop. Begin by formulating the iterative algorithm, visually represent the process with a flowchart, and conclude by implementing the solution in C++.
12	Develop a C++ program to print the Fibonacci series using a do-while loop. Start by outlining the iterative algorithm, create a flowchart to illustrate the sequence, and finalize the solution in C++.
13	Create a C++ program to print the following series using a nested for loop: 1 2 3 4 5 6

	Begin by formulating the iterative algorithm, visually represent the series with a flowchart, and conclude by implementing the solution in C++.
14	Design a C++ program to print prime numbers from 1 to 100 using a for loop. Start by outlining the iterative algorithm, create a flowchart to illustrate the process, and finalize the solution in C++.
15	Develop a C++ program to check if a given year is a leap year or not. Begin by formulating the decision-making algorithm, visually represent the logic with a flowchart, and conclude by implementing the solution in C++.

IT/DSC/T/102: Database Management System using SQL

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

Learning Objectives of the Course:

i) To understand the fundamental concepts of database
ii) To understand user requirements and frame it in data model.
iii) To understand creations, manipulation and querying of data in databases.

Course Outcomes (COs) :

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

i) Design data models, schemas and instances
ii) Design E-R Model for given requirements and convert the same into database tables.
iii) Implement SQL: Data definition, constraints, schema, queries and operations inSQL

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Introduction:** definition of data, information database and DBMS, Database-System Applications, Purpose of Database Systems, View of Data, Instances and Schemas, Data Models	**10 Hrs**
II	**Database Designing**: Design Phases, Design Alternatives, The Entity-Relationship Model, Entity Sets, Relationship Sets, Attributes, Constraints, Mapping Cardinalities, Keys, Primary, Foreign etc. E-R Diagrm, Normalization of database	**10 Hrs**
III	**Database Languages**:Introduction to query languages, Basic structure, DDL Commands, DML Commands, Forms of a basic SQL query (Expression and strings in SQL) Set operations, Aggregate Operators and functions, Date and String functions, Null values.	**10 Hrs**

Text Books:

1. Silberschatz, Abraham, Peter B. Galvin, and Greg Gagne. "Operating System Concepts." Wiley, 2021

Reference Books:

1. Elmasri, Navathe, Somayajulu, Fundamentals of Database Systems, Pearson Education, 4th Edition, 2004.
2. Ramakrishnan, Gehrke, Datab ase Management Systems, McGraw-Hill, 3rd Edition, 2003

IT/DSC/P/128: Lab Course -III (Based on DCS-5)

Total Credits: 02
Maximum Marks : 50 Total Contact Hours: 60 Hrs
Lab

Lab Session No.	Lab Title/Topic
1	Performa normalization to design database schema for different databases like student result generation, Bill generation, Employee Salary slip generation. Draw E-R diagram, design its table structure.
2	Write and execute SQL DML quires to generate database designed in practical no. 1 1. Query to create database 2. Queries to create all tables.
3	Write and execute Table alteration queries 1. Modify table structure add new field, change data type and size of a field 2. Add primary key constraint on all required tables 3. Add foreign key on required tables.
4	Write and execute SQL queries to insert data in to tables 1. Inserting single row. 2. Inserting multiple rows.
5	Write and execute SQL queries to update data 1. Update single row. 2. Update multiple rows.
6	Write and execute SQL queries to delete data 1. Delete single row. 2. Delete multiple rows.
7	Write and execute SQL queries to retrieve data 1. Retrieve single row. 2. Retrieve multiple rows.
8	Write and execute SQL query retrieve data by using order by clause
9	Write and execute SQL query retrieve data by using group by clause
10	Write and execute SQL query retrieve data by using having clause
11	Write and execute SQL query retrieve data by using aggregate functions
12	Write and execute SQL query retrieve data by using String functions

IT/SEC/T/100: Web Designing

Total Credits: 01
Maximum Marks : 50

Total Contact Hours: 15 Hrs

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) Understand basics of Java script and validations using Java Script

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 linking in web page.
v) Understand basics of forms.
vi) Basic validations using Java script

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>, , , <sub>, <sup>, <mark>, <del>, tags. Understanding the use of blockquote>,<q>, <abbr>, <address>, <cite>, and <bdo> tags.	**5 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, Frame tag, 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.	**5 Hrs**
III	Introduction to JavaScript: Overview of JavaScript, definition, features of JavaScript, Applications of JavaScript. JavaScript <script> tag JavaScript Variables and datatypes: what is variables, global variables, Primitive data type and non-primitive (reference) data types Operators in JavaScript JavaScript control statement: if , if else, if else if, switch Introduction to Loops: for loop, while loop, do-while loop, for-in loop.	**5 Hrs**

Text Books:

1. Beginning HTML, XHTML, CSS, and JavaScript by Jon Duckett, Wiley Publishing, Inc.
2. WEB TECHNOLOGIES 2010 by Uttam K.
3. A Smarter Way to Learn JavaScript by Mark Myers

Reference Books:

1. A Smarter Way to Learn JavaScript by Mark Myers
2. JavaScript: The Definitive Guide by David Flanagan

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.

IT/SEC/P/126: Lab Course -I (Based on IT/SEC/T/100)

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

Lab Session No.	Lab Title/Topic
1	Write a HTML program to demonstrate the use of Heading tags.
2	Write a HTML program to demonstrate the use of text formatting tags.
3	Write a HTML program to demonstrate use of list tags and its attributes.
4	Write a HTML program to demonstrate use of anchor tag.
5	Write a HTML program to demonstrate the use of table tags and its attributes.
6	Write a HTML program to demonstrate the use of form tags and its attributes.
7	Write a HTML program to take design an input from.
8	Write a HTML program to demonstrate use of frame tag and its attributes
9	Creating a JavaScript-enabled page, Using the JavaScript alert() method and prompt() method, Using the JavaScript document.write() method
10	Write a program for storing user data in a JavaScript variable
11	Write a program for assigning and adding variables in JavaScript
12	Write a program to demonstrate use of if, if else, if else if in Java Script
13	Write a program to demonstrate use of switch statement in Java Script
14	Write a program to demonstrate use of for loop in Java Script
15	Write a program to demonstrate use of while loop, do-while loop in Java Script

IT/SEC/T/101: Basic Animation with Scratch

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

Learning Objectives of the Course:

i) Understand Scratch's interface and features.
ii) Create basic motion animations and add sound effects.
iii) Learn costume and sprite animation techniques.
iv) Explore advanced animation controls and effects.

Course Outcomes (COs) :

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

i) Navigate and utilize Scratch's interface effectively.
ii) Develop and present simple animated projects using Scratch.
iii) Apply basic animation principles to create engaging animations.
iv) Utilize advanced features in Scratch to enhance animation quality and interactivity.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Module 1: Introduction to Scratch and Basic Animation Concepts Introduction to Scratch: Understanding the Interface Exploring Scratch's Sprite and Stage Features Understanding Motion Blocks for Basic Animation Introduction to Events and Control Blocks	**5 Hrs**
II	Module 2: Creating Basic Animations Creating Simple Motion Animations Adding Sound Effects and Background Music Introduction to Costume and Sprite Animation Using Control Blocks for Animation Timing Creating Interactive Animations with Events	**5 Hrs**
III	Module 3: Advanced Animation Techniques Using Variables for Animation Control Building Character Animations and Sequences Introduction to Pen and Drawing Effects for Animation Advanced Control Blocks for Animation Logic	**5 Hrs**

Reference Books:

1. Williams, Richard. "The Animator's Survival Kit." Faber & Faber, 2009.
2. Marji, Majed. "Programming Scratch: Learn to Program by Making Arcade Games." No Starch Press, 2013.
3. Sylvester, Tynan. "Designing Games: A Guide to Engineering Experiences." O'Reilly Media, 2013.
4. Shiffman, Daniel. "Learning Processing: A Beginner's Guide to Programming Images, Animation, and Interaction." Morgan Kaufmann, 2015.

5. Rall, Hannes. "Animation: From Concept to Production." CRC Press, 2017.
6. Schell, Jesse. "The Art of Game Design: A Book of Lenses." CRC Press, 2008.
7. Ford Jr., Jerry Lee. "Scratch Programming for Teens." Cengage Learning, 2009.
8. Levy, David B. "Animation Development: From Pitch to Production." CRC Press, 2017.
9. Greenberg, Ira, Dianna Xu, and Deepak Kumar. "Creative Coding and Generative Art with Processing." Apress, 2013.
10. Nichols, Poppy, and Steve Roberts. "Exploring Animation Principles in Maya: Follow the Principles, Master the Art." CRC Press, 2019.

E-contents:

1. **Scratch Website:** The official Scratch website (scratch.mit.edu) provides comprehensive resources, tutorials, and project ideas for learning Scratch programming. It also hosts a vibrant community where users can share projects, collaborate, and seek help.
2. **YouTube Tutorials:** Many educators and enthusiasts create free tutorials on YouTube covering various aspects of Scratch programming and animation design. You can search for tutorials tailored to your level and interests.
3. **ScratchEd:** ScratchEd is an online community and resource hub for educators interested in teaching with Scratch. It offers free resources, curriculum guides, and professional development opportunities for educators.

IT/SEC/P/127: Lab Course -I (Based on IT/SEC/T/101)

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

Lab Session No.	Lab Title/Topic
1	**Lab 1: Introduction to Scratch Interface:** Objective: Understand the basic layout and features of Scratch for animation development. Task: Familiarize students with the Scratch interface, including the stage, sprites, and blocks palette.
2	**Lab 2: Exploring Sprite and Stage Features:** Objective: Gain proficiency in manipulating sprites and stage elements for animation creation. Task: Explore the capabilities of Scratch sprites and the stage, including resizing, rotating, and changing costumes.
3	**Lab 3: Motion Blocks for Basic Animation:** Objective: Understand the fundamentals of motion blocks and their application in animation. Task: Experiment with motion blocks to create basic animations, such as sprite movement and rotation.
4	**Lab 4: Introduction to Events and Control Blocks:** Objective: Understand how events and control blocks can be used to control animation sequences. Task: Learn how to use events and control blocks to trigger actions in Scratch animations.
5	**Lab 5: Creating Simple Motion Animations:** Objective: Develop proficiency in creating motion-based animations using Scratch. Task: Create simple motion animations using Scratch, incorporating basic motion blocks and sprite interactions.
6	**Lab 6: Adding Sound Effects and Background Music:** Objective: Explore the role of audio in enhancing the quality of animations. Task: Add sound effects and background music to Scratch animations using built-in sound blocks.
7	**Lab 7: Introduction to Costume and Sprite Animation:** Objective: Understand the concept of sprite animation and its application in creating engaging animations. Task: Experiment with costume changes and sprite animations to create dynamic visual effects.
8	**Lab 8: Using Control Blocks for Animation Timing:** Objective: Learn how to synchronize animation elements using control blocks. Task: Utilize control blocks to control the timing and sequence of animation events.
9	**Lab 9: Creating Interactive Animations with Events:** Objective: Explore interactive storytelling and game design concepts in animation creation. Task: Develop interactive animations using event blocks to respond to user input.

10	**Lab 10: Using Variables for Animation Control:** Objective: Understand the role of variables in dynamic animation control. Task: Implement variables to control animation parameters, such as speed and direction.
11	**Lab 11: Building Character Animations and Sequences:** Objective: Develop skills in character animation and storytelling through sequential animation. Task: Design and animate character sprites using multiple costumes and sequences.
12	**Lab 12: Introduction to Pen and Drawing Effects for Animation:** Objective: Explore the creative possibilities of pen and drawing effects in animation design. Task: Experiment with pen blocks and drawing effects to create custom animation elements.
13	**Lab 13: Advanced Control Blocks for Animation Logic:** Objective: Learn how to implement logic structures for advanced animation behaviors. Task: Use advanced control blocks, such as loops and conditionals, to create complex animation logic.
14	**Lab 14: Collaborative Animation Project:** Objective: Apply learned skills and techniques to a collaborative animation project. Task: Collaborate with peers to create a complex animation project incorporating various animation techniques and concepts.
15	**Lab 15: Animation Showcase and Reflection:** Objective: Evaluate animation projects, share feedback, and reflect on personal learning and growth. Task: Showcase completed animation projects to peers and reflect on the animation creation process.

This course will be available for the students from other faculty

IT/GE/OE/T/100: Cyber Security

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

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. Voc. ITSSD
Semester - II

IT/DSC/T/150: Financial Accounting Using Tally ERP9

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

Learning Objectives of the Course:

i) To provide fundamental knowledge of various terms of accounting.
ii) Teach how to perform various entries in the account book.
iii) Learn to prepare Cashbook, Journal and ledgers.

Course Outcomes (COs) :

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

i) Analyse various terms used in accounting.
ii) Make accounting entries and prepare cash book and other account necessaries.
iii) Prepare accounting equations of various business transactions.
iv) Able to do entry Tally ERP Software.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Module 1: Introduction of Book-keeping and Accountancy** Meaning and definition, Objectives, Importance and Utility, Difference between Book-Keeping and Accountancy, Basis of Accounting - Cash basis and Accrual basis. Qualitative characteristics of accounting information, Financial Accounting, Cost Accounting, Management Accounting **Basic Accounting Terminologies** Business Transactions – Cash, Transactions and Credit Transactions, Goods, Profit, loss-Operating and Non-operating profits, Normal gains and abnormal gains with examples. Difference between profit and Income, Assets, Liabilities, Net-worth/ Owners Equity Assets: Fixed/ Current/Tangible/ Intangible/ fictitious. Contingent Liability. Capital, Drawings. Debtors, Creditors. Capital Expenditure, Revenue and Deferred Revenue Expenditure. Cash discount and Trade discount. Solvent and Insolvent. Accounting Year. Trading Concerns and 'Not for Profit' Concerns. Goodwill **Accounting Concepts, Conventions and Principles and Indian Accounting standards concepts and objectives** Meaning and Importance, Business Entity. Money measurement . Cost. Consistency. Conservatism, Going Concern, Realization, Accrual, Dual Aspect, Disclosure, Materiality, Revenue, Matching, Accounting Standards	**10 Hrs**
II	**Meaning and fundamentals of Double Entry Book-keeping System** Study of Double Entry Book-keeping system. Advantages of Double Entry Bookkeeping system. Comparison of Double Entry Bookkeeping system with Conventional Accounting system. **Classification of Accounts and Accounting equations Rules**	**10 Hrs**

	Types of accounts-personal, Impersonal accounts- Real accounts, Nominal accounts. Rules for different accounts for passing entries. Illustrations Accounting equations Assets, Liabilities, Revenue and capital expenses Brief: Explanation about IFRS. **Source documents required for Accounting** Meaning, contents and specimen. Voucher-internal, external voucher Petty cash and cash voucher Cash and Credit memo Receipt, Debit and Credit note, Pay-in-slip, Withdrawal slip, Cheque-Bearer, Order, Crossed, Account payee, Bank pass book, Bank Statement and Bank advice **Journal** Meaning, Importance and utility of Journal. Specimen of Journal. Writing of Journal entries **Subsidiary Books** Meaning, need and specimen of different Subsidiary Books. Simple Cash Book with cash column only. Cash Book with cash and bank columns. Analytical Petty Cash Book-imprest system. Purchase Book. Sales Book. Purchase Return Book. Sales Return Book Bank Book Journal Proper, Transactions of Discounts to be taken in Journal Proper	
III	**Ledger** Meaning, need and contents of ledger be explained Specimen of ledger. Posting of entries from Subsidiary books to ledger. Balancing of ledger accounts. **Bank Reconciliation Statement** Meaning, need and importance. Reasons for difference in bank balance as per cash book and balance as per bank pass book Specimen of Bank Reconciliation Statement Preparation of Bank Reconciliation Statement **Trial balance** Meaning and Purpose. Specimen of Trial Balance. Preparation of Trial Balance from given balances of accounts. **Errors and their rectification** Meaning and effects of errors. Types of errors - Errors of principles, Errors of Ommission, Errors of commission and Compensating Errors. Steps to locate errors Errors affecting and not affecting. Trial Balance. Treatment of balance of suspense account Rectification entries **Depreciation, Provisions and Reserves** Depreciation : Meaning, Need and Factors affecting depreciation. Methods of computation of Depreciation : Straight Line Method, Written Down Value Method (Excluding Change in method). Accounting Treatment of Depreciation : By charging to asset account by creating Provision for depreciation / accumulated depreciation account. Provisions and Reserves: Meaning, Objectives and Difference between provisions and Reserves. Types of Reserves: Revenue Reserve, Capital Reserve, General Reserve, Specific reserves, Secret reserves. **Financial statements of Proprietary concern** Financial Statements- Meaning, objective and Importance Preparation of Trading Account. Preparation of Profit and Loss Account. Preparation of Balance Sheet. Effects of following adjustments only. Closing stock, Depreciation, Bad and Doubtful debts, Provision for discount on Debtors, and Creditors, Outstanding expenses, Prepaid expenses, Accrued income, Income received in advance, Drawings, Goods distributed as free sample	**10 Hrs**

Text Books: 1. Book-Keeping and Accountancy, HSC Board Pune
Reference Books: 1. New Approach To Accountancy by H.R.Kotalwar 2. Advanced Accountancy by Shukla 3. Accountancy by Mahurkar & Deshpande

IT/DSC/P/176: Lab Course -IV (Based on IT/DSC/T/150)

Total Credits: 02

Maximum Marks : 50 Total Contact Hours: 60 Hrs

Lab Session No.	Lab Title/Topic
1	Installation of Tally software. Understanding its prerequisites
2	Under standing user Interface of Tally.ERP9,
3	Getting knowledge about shortcut keys used in Tally ERP
4	Creating a Company and related accounts in Tally ERP
5	Creating Ledger in Tally ERP
6	Creating Journal in Tally ERP
7	Introduction of GST, how to calculate and record GST
8	Carrey out journal recording entries for 4 different scenarios having at least 25 entries. Check the trial balance, balance sheet, profit and loss account

IT/DSC/T/151: Python Programming-I

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

Learning Objectives of the Course:

i) Learn the syntax and semantics of Python Programming Language.
ii) Write Python functions to facilitate code reuse and manipulate strings.
iii) Illustrate the process of structuring the data using lists, tuples and dictionaries.
iv) Demonstrate the use of built-in functions to navigate the file system.

Course Outcomes (COs) :

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

i) Demonstrate the concepts of control structures in Python.
ii) Implement Python programs using functions and strings.
iii) Implement methods to create and manipulate lists, tuples and dictionaries.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Introduction, Python Basics:** Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program. **Flow control:** Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit().	**10 Hrs**
II	**Functions:** def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling. **Lists:** The List Data Type, Working with Lists, Augmented Assignment Operators, Methods.	**10 Hrs**
III	**Dictionaries and Structuring Data:** The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things. **Manipulating Strings -** Working with Strings, Useful String Methods. **Pattern Matching with Regular Expressions:** Finding Patterns of Text without Regular Expressions, Finding Patterns of Text with Regular Expressions, More Pattern Matching with Regular Expressions, Greedy and Nongreedy Matching, The findall() Method, Character Classes, Making Your Own Character Classes, The Caret and Dollar Sign Characters, The Wildcard Character, Review of Regex Symbols, Case-Insensitive Matching, Substituting Strings with the sub() Method, Managing Complex Regexes, Combining re.IGNORECASE, re .DOTALL, and re .VERBOSE.	**10 Hrs**

Text Books:

1. Al Sweigart, "Automate the Boring Stuff with Python", William Pollock

Reference Books:

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Green Tea Press
2. Charles Dierbach, "Introduction to Computer Science Using Python", 1st Edition, Wiley India Pvt Ltd.
3. Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India.

IT/DSC/P/177: Lab Course -V (Based on IT/DSC/T/151)

Total Credits: 02

Maximum Marks : 50 Total Contact Hours: 60 Hrs

Lab Session No.	Lab Title/Topic
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 print odd numbers from 1 to N
6	Program to demonstrate nested loop
7	Program to check entered number is even or odd
8	Program to print the Fibonacci Series
9	Program to demonstrate use of string handling functions.
10	Program to demonstrate try and except statements to the program no 4 to detect whether the user types in a noninteger string.
11	Write a function that takes a list value as an argument and returns a string with all the items separated by a comma and a space, with and inserted before the last item.

IT/DSC/T/152: Hardware Basics CCTV and Projector

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

Learning Objectives of the Course:

i) Learn working of PC and SMPS
ii) Learn various ports and their connections
iii) Understand Motherboard BIOS setting and network setting
iv) Installation of operating systems and its setting
v) Understand working and settings of CCTV & Projector

Course Outcomes (COs) :

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

i) Assemble a PC and able solve basic trouble shooting
ii) Connecting various peripheral devices and installation of their drivers
iii) Perform BIOS setting and IP setting
iv) Install different Operating systems like Window, Linux.
v) Perform CCTV Settings and taking backup, connecting Projector to PC/Laptop and its setting.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**Understanding and Working with Personal Computers** Understanding How PCs Work. The Four Main Functions of Computing. PC Hardware Components. How PCs Work. Working with PCs. PC Workspaces and Tools, Preventive Maintenance, Environmental and Safety Concerns. SMPS: Types and its working trouble shooting	**10 Hrs**
II	**Motherboard** Motherboards & Central Processing Units, Identifying Motherboards, Types of Motherboards, Motherboard Form Factors, Mother Board Components : Central Processing Unit (CPU), Processor Sockets and various Slots, Motherboard Buses, Chipsets, Expansion Slots, Memory Slots, Connectors, BIOS Setup, CMOS Battery, Jumpers and DIP Switches, Firmware, Cache Memory Study of Peripheral Devices, Connecting these Devices to system Installation of Device Driver and Configuration of various Devices Types of RAMS (DDR2, DDR4,...) and hard drives, Graphics Cards: Introduction, working and types.	**10 Hrs**
III	**Operating System Settings:** Operating System Installation (Windows, Linux), Creating Users, types of Users. IP setting for network shearing and Internet access in Windows and Linux. Antivirus types, installation, Configuration, updating, PC cleaning. **CCTV:** Types of cameras, Cables used in CCTV, Configuration and installation of cameras, DVR and its Settings, taking backup of recording. **Projector:** Types of Projectors, Installation, Configuration, settings.	**10 Hrs**

Text Books:

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

Reference Books:

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

E-contents:

1. http://www.coursesmart.com/9780470114117/chap01#X2ludGVybmFsX1BGUmVhZGVyP3htbGlkPTk3ODA0NzAxMTQxMTcvNzg=

IT/DSC/P/178: Lab Course -VI (Based on IT/DSC/T/152)

Total Credits: 02
Maximum Marks : 50
Total Contact Hours: 60 Hrs

Lab Session No.	Lab Title/Topic
1	Laboratory Tools and equipment handling Techniques.
2	Assembling and disassembling a PC
3	PC Cleaning.
4	SMPS Testing and troubleshooting
5	Types of cables used in PC connection internal and external, data cables, power supply, VGA, HDMI, etc.
6	Mother board parts and their connection fitting a motherboard changing CMOS battery, RAM, HDD, CD/DVD drive, adding a HDD.
7	Basic BIOS settings.
8	Installation of Windows operating system (Windows7 – Windows10).
9	Creating users and assigning rights to users, sharing folders and devices in a network, IP settings.
10	Installing device drivers (automatic and manual).
11	CCTV installation and DVR settings with app management.
12	Projector installation and settings.
13	Preventive maintenance of PC (Disk Cleanup, disk defragmentation, check disk & fixing errors)

IT/VSC/T/150: Web Designing using Bootstrap.

Total Credits : 01 Total Contact Hours : 15 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

i) Bootstrap Page Structure, Grid System, Layouts
ii) Bootstrap Typography, Styling Images, Tables, Buttons, Badges, & Progress Bars
iii) Bootstrap Pagination, Panels, Menus & Navigation Bars
iv) Bootstrap Carousel & Modals, Scrollspy, Themes

Course Outcomes (COs) :

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

i) Students learn to create the front-end component of mobile-responsive web applications, using the Bootstrap framework.
ii) Able to design a web applications adhere to strict development standards to avoid cross-browser and cross-device compatibility issues.
iii) To embedding Bootstrap into web pages, explore the Bootstrap Grid system and popular mobile responsive web layouts.
iv) Students will gain a solid understanding of almost every Bootstrap component available, from typography, carousels, panels, drop-down menus, and collapsible nav-bars to forms, popovers, modals and tool tips.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Bootstrap, Embedding Bootstrap, Bootstrap Basic Page Structure, Bootstrap Grid System, Bootstrap Three Column Layouts, Bootstrap Typography, Bootstrap Tables, Bootstrap Styling Images, Bootstrap Jumbotron, Bootstrap Wells, Bootstrap Alerts, Bootstrap Buttons, Bootstrap Button Groups, Bootstrap Justified Button Groups	**5 Hrs**
II	Bootstrap Glyphicons, Bootstrap Badges and Labels, Bootstrap Progress Bars, Bootstrap Pagination, Bootstrap Pager Pagination, Bootstrap List Groups, Bootstrap Panels, Bootstrap Dropdown Menus, Bootstrap Collapsibles, Bootstrap Collapse Panel, Bootstrap Collapse List Group, Bootstrap Accordian, Bootstrap Tab Menus, Bootstrap Pill Menus, Bootstrap Dynamic Tabs and Pills,	**5 Hrs**
III	Bootstrap Navigation Bar, Bootstrap Collapsible Navigation Bar, Bootstrap Forms - Vertical and Inline, Bootstrap Inputs, Bootstrap Form Control States, Bootstrap Input Sizing, Bootstrap Carousel, Bootstrap Modal, Bootstrap Tooltip, Bootstrap Popover, Bootstrap Scrollspy, Bootstrap Project - Themes Intro	**5 Hrs**

Reference Books:

1. Learn Bootstrap Web Design by Aadishree Avinash Pagar
2. Bootstrap 5 Foundations by Daniel Charles Foreman

IT/VSC/P/176- Practical Based on IT/VSC/T/150

Total Credits : 01 Total Contact Hours : 30 Hrs

Maximum Marks : 50

List of practical to be conducted in Laboratories :

1) Practical to demonstrate use of tables,
2) Practical to demonstrate use of Styling Images
3) Practical to demonstrate use of Bootstrap Jumbotron
4) Practical to demonstrate use of Bootstrap Wells and Alerts
5) Practical to demonstrate use of Bootstrap Buttons, Button Groups, Justified Button Groups
6) Practical to demonstrate use of Bootstrap Glyphicons
7) Practical to demonstrate use of Bootstrap Badges and Labels
8) Practical to demonstrate use of Bootstrap Progress Bars,
9) Practical to demonstrate use of Pagination, Pager Pagination
10) Practical to demonstrate use of List Groups, Panels,
11) Practical to demonstrate use of Bootstrap Dropdown Menus,
12) Practical to demonstrate use of Bootstrap Collapsibles, Bootstrap Collapse Panel, Bootstrap Collapse List Group
13) Practical to demonstrate use of Bootstrap Tab Menus, Pill Menus, Dynamic Tabs and Pills.
14) Practical to demonstrate use of Bootstrap Navigation Bar, Collapsible Navigation bar.
15) Practical to demonstrate use of Bootstrap Forms - Vertical and Inline, Inputs, Form Control States,
16) Practical to demonstrate use of Bootstrap Input Sizing, Carousel, Tooltip

IT/VSC/T/151: Graphics Designing using Canva

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

Learning Objectives of the Course:

v) Understand Canva Interface: Familiarize yourself with the layout and tools available in Canva for creating graphics and designs.
vi) 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.
vii) Apply Design Principles: Gain knowledge of basic design principles such as layout, color theory, and typography, and apply them effectively in your Canva designs.
viii) 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)	**5 Hrs**

	3. Using Canva Templates and Customizing Them (2 hours) 4. Designing Infographics and Presentations (1 hour)	

Reference Books:

E-contents:

5. **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/
6. **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.
7. **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.
8. **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.

IT/VSC/P/177: Lab Course -I (Based on IT/VSC/T/151)

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

IT/GE/OE/T/150: E-Commerce

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

Learning Objectives of the Course:

i) After the successful completion of the course the student must be aware of Techniques in Application of e-commerce.
ii) This course is designed to provide basic knowledge about Electronic Commerce.

Course Outcomes (COs) :

i) Student will get knowledge of different aspects of E-Commerce
ii) Able to identify different components of E-Commerce
iii) Will get knowledge of different security technologies used in E-Commerce.
iv) Understand the risk in the e-commerce business.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction, IT and business, E-commerce: Concepts, Benefits of E-Commerce; Types of E-Commerce, Advantages and Disadvantage of E-commerce, Electronic Communication, PCs and Networking, E-mail, Internet and intranets.	**10 Hrs**
II	EDI to E-commerce, EDI, UN/EDIFACT. Concerns for E-commerce Growth, Internet bandwidth, Technical issues, Security issues, Legal issues. Roadmap of e-commerce in India.	**10 Hrs**
III	Security Technologies: Encryption, Symmetric key Encryption, Public key encryption, Public key encryption using digital Signatures. Hashing techniques, Certification and key Distribution.	**10 Hrs**

Text Books:

1. E-Commerce: The Cutting Edge of Business, Kamlesh K. Bajaj & Debjani Nag, Tata McGraw Hill.
2. E- Commerce Strategy , Technologies and Applications, David Whiteley, McGraw Hill Edition