DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,

CHHATRAPATI SAMBHAJINAGAR.

NAAC- 'A+' Grade

CIRCULAR NO.SS/ Sci & Tech./ B.Voc /13 /2025.

It is hereby inform to all concerned that, on the recommendation of the Dean, Faculty of Sconce & Technology; **the Academic Council at its meeting held on 21 July, 2025 has been accepted *the "following Curriculum at UG Level* as per National Education Policy-2020" *for the implementation of all concerned affiliated colleges*** under the Faculty of Science & Technology.

Sr.No	Subject Name	Semester
1.	B.Voc in Plant Tissue Culture and Green House Technology (Pattern 2024)	I & II
2.	B.Voc in Renewable Energy Sources (Pattern 2024)	I & II
3.	B.Voc in Architectural Planning & Interior Design	III & IV
4.	IT Skills and Software Development	III & IV

This is effective from the Academic Year 2025-26 onwards under the Faculty of Science & Technology.

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, 1420-22
Chhatrapati Sambhajinagar-431004.
Ref. No. S S/Sci & Tech/B.Voc./2025-26/
Date: 01/ 08/ 2025

Deputy Registrar,
Syllabus Section

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Copy forwarded and Information to neccssary action:-

1] **The Head, concerned Department,**

2] **The Director, Board of Examination & Evaluation,**

3] **The Director,** University Network & Information Centre, UNIC, with a **request to upload this circular on University Website.**
Dr. Babasaheb Ambedkar Marathwada University **Chhatrapati Sambhajinagar.**

Dr. Babasaheb Ambedkar Marathwada University,

Chhatrapati Sambhajinagar- 431001

Three Year

B. Voc. Degree Program

Course Structure

(AS PER NEP-2020)

Subject (Major):

IT Skills and Software Development

(Pattern 2024)

Second Year Syllabus

Effective from 2025-26

Coordinator
B.VOC. in IT Skills &
Software Development
S.B.E.S. College of Science,
Aurangabad - 431 001

PRINCIPAL
S.B.E.S. College of Science
Chh. Sambhajinagar

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 Vocation in ITSSD 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 in ITSSD 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 Vocation in ITSSD 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 in ITSSD 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 in ITSSD 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.

Programme Educational Objectives (PEOs) :

These Programme Educational Objectives delineate the core principles guiding the Bachelor of Computer Applications curriculum, underscoring our commitment to nurturing graduates equipped to excel in their careers, contribute meaningfully to society, and lead purposeful lives amidst the rapid evolution of technology.

1. **Mastery of Discipline-Specific Knowledge**: Graduates of the Bachelor of Computer Applications program will demonstrate a profound comprehension of fundamental principles, theories, and methodologies in computer application development and related fields. This expertise will empower them to dissect intricate computational problems, devise innovative solutions, and contribute to advancements in the realm of computer applications.

2. **Interdisciplinary Proficiency**: Graduates will possess the adeptness to synthesize knowledge and skills from various domains within computer science, fostering a holistic approach to problem-solving and innovation. They will be equipped to tackle multifaceted challenges by integrating diverse perspectives and methodologies, ensuring comprehensive solutions in the ever-evolving landscape of technology.

3. **Critical Thinking and Analytical Skills**: Graduates will cultivate robust critical thinking abilities, enabling them to scrutinize information rigorously, analyze data effectively, and make well-founded decisions grounded in evidence. Proficiency in logical reasoning and scientific methodologies will empower them to address complex computational problems and spearhead novel solutions.

4. **Leadership and Innovation**: Graduates will exhibit leadership qualities and an entrepreneurial mindset essential for catalyzing positive change in technological spheres. They will showcase creativity, resilience, and adaptability, leveraging innovation to confront intricate challenges and capitalize on opportunities for advancement within the dynamic landscape of computer applications.

Global Citizenship and Cultural Sensitivity: Graduates will embrace a global perspective and cultural sensitivity, acknowledging the interconnectedness of diverse communities in the digital age. They will actively engage in cross-cultural dialogue, embrace diversity, and contribute to the enrichment of knowledge and understanding on a global scale, fostering collaboration and cooperation across borders.

Programme Outcomes (POs) :

These outcomes are designed to equip graduates with the technical expertise, analytical acumen, ethical sensibilities, and lifelong learning capabilities necessary to thrive in the dynamic landscape of computer application.

1. **PO 1 – Disciplinary knowledge:**

Graduates will adeptly apply mathematical principles, algorithmic paradigms, and core computing fundamentals in the modeling, design, and development of computer-based systems, leveraging advanced technologies to address contemporary challenges.

2. **PO 2 – Scientific reasoning/ Problem analysis:**

Graduates will demonstrate advanced analytical skills to systematically analyze, categorize, and formulate solutions for multifaceted problems encountered within the domain of computer applications, utilizing cutting-edge technologies to enhance problem-solving capabilities.

3. **PO 3 – Problem solving:**

Graduates will engineer software solutions to address complex scientific, business, and societal challenges, integrating considerations for modern technologies while prioritizing public health, safety, and environmental sustainability.

4. **PO 4 – Environment and sustainability:**

Graduates will comprehend the environmental and societal impact of software solutions, striving to develop sustainable applications that promote societal well-being within the context of modern technological advancements.

5. **PO 5 – Modern tool usage:**

Graduates will proficiently utilize contemporary software development tools and methodologies to facilitate efficient and collaborative development practices, incorporating emerging technologies seamlessly into their workflows.

6. **PO 6 – Ethics:**

Graduates will navigate ethical complexities inherent in computer application development, upholding professional integrity and social responsibility within the dynamic landscape of technology integration.

7. **PO 7 – Cooperation / Teamwork:**

Graduates will collaborate effectively as integral members or leaders of interdisciplinary teams, leveraging diverse skill sets and perspectives to achieve collective objectives in software development projects.

8. **PO 8 – Communication Skills:**

Graduates will demonstrate proficiency in communicating technical concepts and insights to diverse audiences, adeptly preparing and presenting technical documentation tailored to the needs of stakeholders in computer application projects.

9. **PO 9 – Self-directed and Life-long Learning:**

Graduates will exhibit a proactive commitment to continuous self-improvement and professional development, recognizing the imperative of lifelong learning to remain abreast of evolving technologies and industry trends.

10. **PO 10 – Enhance the research culture and uphold scientific integrity and objectivity:**

Graduates will actively contribute to fostering a vibrant research culture, upholding the principles of scientific integrity, objectivity, and reproducibility in their scholarly pursuits within the diverse realms of computer applications.

Programme Specific Outcomes (PSOs):

1. **PSO1. Software Application Development Excellence**: Apply programming paradigms and software engineering principles, practices, and tools to analyze, design, implement, test, and maintain software systems that meet quality standards and user requirements.
2. **PSO2. Web Application Development Mastery**: Design and develop dynamic and interactive web applications using modern web technologies and frameworks, ensuring compatibility, performance, and security across different platforms and devices.
3. **PSO3. Data-driven Decision Making:** Utilize data analysis techniques, statistical models, and visualization tools to analyze, interpret, and present data effectively for decision-making and problem-solving in diverse domains.
4. **PSO4. Cybersecurity Implementation:** Implement security measures, conduct risk assessments, and respond to security incidents to protect information assets and mitigate cyber threats effectively, ensuring data confidentiality, integrity, and availability.
5. **PSO5. Cloud Computing Integration:** Design, deploy, and manage scalable and cost-effective cloud-based solutions using cloud computing technologies and platforms, ensuring reliability, availability, and performance to meet business needs and enable digital innovation.
6. **PSO6. User Experience Innovation:** Design and evaluate user interfaces and interactive systems using human-centered design approaches to create engaging, accessible, and usable experiences that meet user needs and preferences.

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

Subject (Major): IT Skills and Software Development

B. Voc. ITSSD Second Year: 3rd Semester

Course Type	Course Code	Examination Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
				Theory	Practical	Theory	Practical	
Major (Core) Mandatory DSC	IT/DSC/T/200		Adv. Hardware and Network Basics	2		2		2+2+2+2 = 08
	IT/DSC/T/201		Python-II	2		2		
	IT/DSC/P/ 226		Practical based on IT/DSC/T/200		4		2	
	IT/DSC/P/ 227		Practical based on IT/DSC/T/201		4		2	
Minor (Choose any two from pool of courses) **It is from different discipline of the same faculty**	IT/Mn/T/ 200			2		2		2+2 = 04
	IT/Mn/T/ 201			2		2		
Generic / Open Elective (GE/OE) **It should be chosen compulsorily from the faculty other than that of Major**	IT/GE/OE/T/200		(Choose any one from pool of courses)	2		2		02
VSC (Vocational Skill Courses) (Choose any one from IT/VSC/T/ 200 and IT/VSC/T/ 201) and corresponding Practicals	IT/VSC/T/ 200		Graphics Designing	1		1		1+1 =02
	IT/VSC/T/ 201		UX Designing	1		1		
	IT/VSC/P/ 226		Practicals based on IT/VSC/T/ 200		2		1	
	IT/VSC/P/ 227		Practicals based on IT/VSC/T/ 201		2		1	
AEC, VEC, IKS	IT/AEC/T/200		**English** (Common for all the faculty)	2		2		2 + 2 = 04
	IT/VEC/T/201		Environmental Studies	2		2		
OJT/ FP/CEP/CC/RP	IT/CC/P/ 226		Cultural Activity / NSS,NCC (Common for all the faculty)		4		2	02
				15	**14**	**15**	**07**	**22**

Minor courses for other discipline

IT/Mn/T/ 200 - Aptitude and Logical Reasoning

IT/Mn/T/ 201 - Principles of Management

Generic /Open Elective Courses for other faculty

IT/GE/OE/T/200 Cyber Ethics and Cyber Law

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B. Voc. ITSSD Second Year: 4th Semester

Course Type	Course Code	Examination Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
				Theory	Practical	Theory	Practical	
Major (Core) Mandatory DSC	IT/DSC/T/250		Adv. DBMS and Adv. Networking	2		2		2+2+2+2 = 08
	IT/DSC/T/ 251		PHP Programming-I	2		2		
	IT/DSC/P/ 276		Practical based on IT/DSC/T/250		4		2	
	IT/DSC/P/ 277		Practical based on IT/DSC/T/ 251		4		2	
Minor (Choose any two from pool of courses) **It is from different discipline of the same faculty**	IT/Mn/T/250			2		2		2+2 = 04
	IT/Mn/T/ 251			2		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/250			2		2		02
SEC (Skill Enhancement Courses) (Choose any one from IT/SEC/T/250and IT/SEC/T/ 251) and corresponding Practicals	IT/SEC/T/250		Advance Excel	1		1		1+1 =02
	IT/SEC/T/ 251		UI Designing	1		1		
	IT/SEC/P/ 276		Practicals based on IT/SEC/T/250		2		1	
	IT/SEC/P/ 277		Practicals based on IT/SEC/T/ 251		2		1	
AEC, VEC, IKS	IT/AEC/T/250		Modern Indian Language (MIL-2) (Choose any one from pool of language courses)	2		2		02
OJT/ FP/CEP/CC/RP	IT/FP/P/ 276		Field Project		4		2	2+2= 04
	IT/CC/P/ 277		(Fine/ Applied/ Visual/ Performing Arts) (Common for all the faculty)		4		2	
				13	**18**	**13**	**09**	**22**
Exit Option : Award of UG Diploma in major and minor with 88 credits and an additional 4 credits NSQF course (related to major / minor) / Internship during summer vacation OR Continue with Major and Minor								

Minor courses for other discipline

IT/Mn/T/ 250 - Campus to Corporate

IT/Mn/T/ 251 - 2-D Designing using Photoshop

Generic /Open Elective Courses for other faculty

IT/GE/OE/T/250- Fundamental of Computer Network

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B. Voc. ITSSD
Semester - III

IT/DSC/T/200: Adv. Hardware and Network Basics

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand the common causes of application software malfunctions and troubleshoot related issues.
2. Diagnose and resolve common problems in hardware components such as display, power supply, input/output ports, RAM, and storage devices.
3. Identify and troubleshoot various network connectivity issues including IP conflicts, firewall restrictions, and driver problems.
4. Configure different types of internet connections and address common connectivity issues.
5. Learn to install and troubleshoot peripheral devices such as webcams, fingerprint sensors, Bluetooth devices, and internal mice/touchpads.
6. Understand basic networking concepts, types of networks, topologies, models, and protocols.
7. Identify and differentiate between network devices and their uses within various network architectures.

Course Outcomes (COs) :

After successful completion of this course, students will be able to:

- **CO1:** Diagnose and resolve common application software issues such as installation failures or execution errors.
- **CO2:** Identify and troubleshoot network problems including driver issues, IP conflicts, and faulty hardware.
- **CO3:** Configure broadband internet connections and resolve setup-related issues across different connection types (ADSL, cable, etc.).
- **CO4:** Install and troubleshoot peripheral devices including webcams, Bluetooth modules, sound systems, and display components.
- **CO5:** Resolve common hardware issues related to SMPS, battery, input devices (keyboard, touchpad), RAM, and hard drives.
- **CO6:** Explain the fundamentals of computer networks, including the need, characteristics, types (LAN, WAN, MAN), and topologies.
- **CO7:** Differentiate between various network models (peer-to-peer, client-server) and describe their use cases.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Trouble shoots for Application software malfunctioning: Issue opening or running a software program. Unable to install a software program. Trouble shoots for Network problems. Bad network card drivers or software settings. Firewall preventing computers from seeing each other. Connection related issues. Bad network hardware. Connection IP conflict problem etc. Internet Configuration Different types of internet connection and their configuration method. Broad band connection (ADSL and Cable etc.).Webcam installation. Troubleshoot while configuring internet.	10 Hrs
II	Problems in different input and output ports. Adaptor Problems, S.M.P.S ProblemsDisplay Problems. Finger Prints Problems. Webcam Problems.Bluetooth Problems.LAN Problems, Ethernet Port Not Working, Sound problem: Sound Not Working, Intermediate Sound,Low Sound Battery Problems, Not Booting, No charging, Less battery backup.. Keypad Problems, Touch pad/Pointers Not Working, Mouse (Internal) Not Working, RAM Related Problems Hard Disk Related Problems.	10 Hrs
III	Networking Concepts: introduction to network, characteristics, need, types of networks on the basis of area coverage; LAN Wan, MAN; advantages and	10 Hrs

	disadvantages of networks. Network topologies: Bus, ring, star, tree, mesh, and hybrid topology . Network models: Peer-to-pee, protocol, client/ Server network and hybrid type network. Network protocols, DSN, FTP, Telnet, DHCP, HTTP, TFTP, SSH, SFTP, SMTP, POP, IMAP, NTP network devices.	

Reference Books:

1. Mastering PC Hardware & Network, Dr. Ajit Mittal, Dr. Ajay Rana
2. How Computers Work, Ron White
3. Service Manual Mother Board & Laptop, GT Publication
4. Laptop Repair Complete Guide, Garry Romaneo
5. The Laptop Repair Workbook, Morris Rosenthal
6. Tannenbaum, A.S., 2003: Computer Networks, Prentice Hall.
7. Networking: The Complete Reference 1st Edition, Mcgraw Hill Education
8. Stallings, William, Local and Metropolitan Area Networks: Macmillan Publishing Co.

IT/DSC/P/ 226: Practical based on IT/DSC/T/200 (Adv. Hardware and Network basics)	
Total Credits : 02 Maximum Marks : 50	Hours : 60 Hrs
Sample List of experiments to be carried out based on the course IT/DSC/T/201.Teaching faculty may alter these practical as per the availability of resources and need of industry	
1.	Troubleshooting a Software Not Opening: Simulate a corrupted application file or missing dependency, Check error logs, reinstall or repair the application
2.	Simulate and Solve Software Installation Failure: Identify issues with OS compatibility, disk space, or administrator rights during software installation.
3.	Internet Not Working – Troubleshoot IP Conflicts : Use `ipconfig`, `ping`, and `tracert` to diagnose and fix a conflicting IP address problem.
4.	Fixing Network Access Blocked by Firewall : Simulate a firewall blocking access to shared folders or applications and modify rules to allow access.
5.	Configure a Broadband (ADSL or Cable) Internet Connection :Demonstrate setting up a PPPoE or DHCP-based broadband connection.
6.	Install and Configure a Webcam :Install drivers, test webcam functionality in different software, and troubleshoot driver issues.
7.	Setup and Troubleshoot Wi-Fi Connection on a PC : Simulate common issues like incorrect password, hidden SSID, or disabled adapter, and fix them.
8.	Diagnose and Solve Input/Output Port Issues :Test USB, audio jack, and HDMI ports for faults using loopback or port-testing tools.
9.	Troubleshoot S.M.P.S and Power Issues :Identify non-booting systems due to power supply issues using multimeter or PSU tester.
10.	Fix Sound Not Working or Low Volume Issues: Diagnose sound driver errors, disabled playback devices, or faulty audio jack issues.
11.	Diagnose Battery and Charging Problems in Laptops: Test with battery report (`powercfg /batteryreport`), identify charging issues, check adapter voltage.
12.	Repair Mouse/Touchpad or Keyboard Malfunctions: Simulate disabled input device issues and enable/fix via driver manager or BIOS settings.
13.	**Identify and Solve RAM and Hard Disk Issues:** Use tools like MemTest86, Windows Memory Diagnostic, and `chkdsk` to test and repair.
14.	Design and Simulate Network Topologies: Use Cisco Packet Tracer or real hardware to design Bus, Star, and Mesh networks.
15.	Configure and Demonstrate Network Protocols: Setup and explain protocols like FTP, DHCP, HTTP using tools like FileZilla, DHCP Server tool, and browser diagnostics.

IT/DSC/T/201: Python-II

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

Learning Objectives of the Course:

- To learn how to design object-oriented programs with Python classes.
- To learn how to use class inheritance in Python for reusability.
- To learn GUI designing .
- To learn database implementation in python programming.

Course Outcomes (COs) :

After successful completion of this course, students will be able to:

CO1: Understand core OOP principles: Encapsulation, Abstraction, Inheritance, Polymorphism
CO2: Work with classes and objects: Define classes, instantiate objects, and use __init__() constructors
CO3: Implement decorators
CO4: Manage attributes
CO5: Apply inheritance: Implement single, multiple, and multilevel inheritance
CO6: Overload and override methods
CO7: Designing and Implementing GUI.
CO8: Designing and using database in Python programming.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Object Oriented, OOPs concept, Class and object, Decorators, Attributes, Inheritance, Overloading, Overriding, Data hiding	10 Hrs
II	Mathematical computing with Python, Data migration and visualization: Pandas and Matplotlib, Data manipulation with Pandas. Python API:Introduction,types,popular frame works for building API:Flask,Django	10 Hrs
III	Database Interaction: Working with SQL databases using libraries like SQLAlchemy.performing CRUD operations. GUI programming, and web development.	10 Hrs

Reference Book

1. The Complete Reference by Martin C. Brown (Author)
2. Core Python Programming by R. Nageswara Rao (Author)

IT/DSC/P/ 227: Practical based on IT/DSC/T/201 (Python-II)	
Total Credits : 02 Maximum Marks : 50	Hours : 60 Hrs
Sample List of experiments to be carried out based on the course IT/DSC/T/201	
16.	Write a program to create a class circle calculate area and perimeter.
17.	Write a program for demonstration of overloading
18.	Write a program for demonstrating single inheritance.
19.	Write a program for demonstrating hierarchical inheritance.
20.	Write a program to demonstrate multilevel inheritance.
21.	Write a program to demonstrate overriding.
22.	Write a program in python to create simple GUI form using Tkinter
23.	Write a program in python to establish database connection, creating database & creating table
24.	Write a program in python to perform CRUD operations on records from database.
25.	Write a program in python to demonstrate Flask framework.

IT/Mn/T/ 200: Aptitude and Logical Reasoning

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand and interpret different types of data presentation formats such as bar charts, pie charts, line charts, and tables.
2. Apply logical reasoning to solve problems involving number series, blood relations, odd one out, and directions.
3. Develop foundational arithmetic skills including operations with number systems, simplifications, and root extractions.
4. Solve real-world mathematical problems involving averages, percentages, profit and loss, ratios, and proportions.
5. Apply concepts of probability, permutations, and combinations in practical and theoretical scenarios.
6. Enhance analytical thinking and problem-solving capabilities required for competitive and aptitude-based assessments.

Learning Outcomes

After completing this course, students will be able to:

- **CO1:** Analyze and interpret data from visual formats like bar graphs, pie charts, line graphs, and tables.
- **CO2:** Solve problems based on logical reasoning including number series, blood relations, and direction-based reasoning.
- **CO3:** Perform arithmetic operations using number systems, surds, indices, and decimal fractions with accuracy.
- **CO4:** Calculate averages, percentages, and handle problems related to profit and loss, partnership, and ages.
- **CO5:** Apply ratio and proportion concepts in mathematical and real-life situations.
- **CO6:** Solve problems based on HCF, LCM, square roots, and cube roots efficiently.
- **CO7:** Use principles of probability, permutation, and combination to solve quantitative reasoning problems.
- **CO8:** Demonstrate improved speed and accuracy in solving aptitude questions, applicable in academic and professional examinations.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Reasoning Ability: Reasoning Ability: Data interpretation (bar chart, pie chart, line chart,tables) , number series, blood relations, odd series, Distance and Direction etc.	10 Hrs
II	Arithmetic: Number System, Simplification, Square root & Cube root, Surds and Indices, HCF, LCM Decimal fraction, Average.	10 Hrs
III	Percentage, Problem on Ages, Partnership, Profit & loss, Ratio & proportion. Probability, Permutation and combination.	10 Hrs

Text Books

1. Quantitative Aptitude by R.S. Agarwal
2. Verbal & Non-verbal Reasoning by R.S. Agarwal

Reference Books

1. English Grammar, Wren & Martin
2. Cracking the Test of Reasoning & Data Interpretation, Prof. Jagdeep Vaishnav, Nishant B. Patel, Biztantra

IT/Mn/T/ 201: Principles of Management

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives

- Principles of management have mainly objective of Coordination and proper administration of businesses.
- Management is an essential function of Businesses.
- It allows for ensuring that the work done by the individual elements of the firm are combined for the furtherance of the collective objective of the firm.

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

- Describe the primary functions of management and the roles of managers.
- Describe the work of major contributors to the field of management
- Describe the work of major contributors to the field of management

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Management, Meaning & Definition of Management, Significance of Management, Functions of Management, Principles of Management	10 Hrs
II	Management V/S Administration, Levels of Management, Roles and Skills of Manager. Planning and Organizing, Meaning & Definition of Planning, Characteristics and Importance of Planning, Planning Process, Types of Plans,	10 Hrs
III	Meaning & Definition of Organization, Guiding Principles of Organisation, Process of Organisation, Centralisation V/S Decentralisation, Forms of Organisation Structure :(Line, Functional, Line Staff, Limited Liability Partnership (LLP), One Person Company)	10 Hrs

Text Books

1. Elements of Discrete MathematiCA-A Computer Oriented Approach C. L Liu, D.P. Mohapatra, 3rd edition Tata McGraw Hill.
2. Discrete Mathematical Structures with Applications to Computer Science,J. P.Tremblay and P. Manohar,Tata McGraw Hill
3. Foundations of Computer Science, A. Aho and J. Ullman- W. H. Freeman, 1992.

Reference Books

1. Business Organization & Management by C B Gupta
2. Principles & Practices of Management by L M Prasad
3. Management by Koontz and Weighrich

IT/GE/OE/T/200: Cyber Ethics and Cyber Law

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

Learning Objectives of the Course:

1. Understand Cyber Space, Cyber Crime, Cyber Laws, Information Technology, Internet, Internet Services
2. Know Legal Aspects of Regulation concerned with Cyber Space, Technology and Forms of Cyber Crimes
3. Understand Computer Crimes and Cyber Crimes, Cyber Crime in Global and Indian Response.
4. Understand Criminal Liability, Cyber Crime implications and challenges.
5. Learn Precaution & Prevention of Cyber Crimes, Human Rights perspective of Cyber Crime

Learning Outcomes

1.Understand Cyber Space, Cyber Crime, InformationTechnology, Internet & Services.
2. List and discuss variousforms of Cyber Crimes
3. Explain Computer and Cyber Crimes
4. Understand Cyber Crime at Global and Indian Perspective.
5. Describe the ways of precaution and prevention of Cyber Crime as well as Human Rights

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Cyber Law Evolution of computer technology, emergence of cyber space, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.	10 Hrs
II	Information Technology Act Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.	10 Hrs
III	The Importance of Cyber Law, Significance of Cyber Ethics, Need for Cyber regulations and Ethics. Ethics in Information society, Introduction to Artificial Intelligence Ethics: Ethical Issues in AI and core Principles, Introduction to Block chain Ethics.	10 Hrs

Text Books

1. Cyber Laws: Intellectual property & E Commerce, Security- Kumar K, Dominant Publisher
2. Cyber Ethics 4.0, Christoph Stuckelberger, Pavan Duggal, by Globethic
3. Godbole,"Information Systems Security", Willey

Reference Books

1. Reich, Pauline C, "Law, Policy, and Technology: Cyberterrorism, Information Warfare, and Internet Immobilization", IGI Global, 2012.
2.Sudhir Naib, The Information Technology Act, 2005: A Handbook, OUP, New York.

IT/VSC/T/200: Graphics Designing

Total Credits : 01 Hours : 15 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand the fundamental concepts, features, and applications of Adobe Photoshop.
2. Recognize different image file formats, resolutions, and the relationship between image size and quality.
3. Apply principles of design and color theory in digital artwork.
4. Navigate and utilize the Photoshop workspace, toolbox, and interface effectively.
5. Develop proficiency in various selection tools and techniques for precise image editing.
6. Gain in-depth knowledge of layers, layer styles, masks, and their functional advantages.
7. Apply a range of filters and effects to manipulate images for creative outcomes.
8. Use painting tools, gradients, and vector drawing tools for detailed compositions.
9. Design UI/UX prototypes, website layouts, and other digital media outputs like brochures and flyers.
10. Differentiate between raster and vector graphics and apply appropriate tools accordingly.

Course Outcomes (COs) :

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

- **CO1:** Explain the features, applications, and limitations of Photoshop software.
- **CO2:** Identify and use different image file formats, resolutions, and design principles effectively in digital work.
- **CO3:** Demonstrate mastery in using selection tools and advanced selection techniques for image editing.
- **CO4:** Work with layers and masks proficiently to organize and enhance image compositions.
- **CO5:** Apply and manage various filters and effects for image stylization and corrections.
- **CO6:** Utilize painting and vector tools to create illustrations, patterns, and vector paths.
- **CO7:** Design professional-level digital media assets including website layouts, business cards, flyers, and brochures.
- **CO8:** Construct user interface components using design principles and wireframes for web design.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Photoshop Basics & Art of Selection:Introduction, Features, Applications, Advantages & Limitations of Software, Image file formats, Resolution, Aspect ratio, image size, color theory, Design principles, Workspace, tool box. Selection tools: Marquee selection, lasso selection, Magic & Quick selection, and adjusting pixel selection, Selection techniques: edge refine, color range, Quick mask mode, transform, path selection. Layers and Mask: Layer basics, adding layer, duplicate layers, arrange layers, merge & group layers, sort layers, creating layer styles, locking layers, flatten layer, basics of mask, types of masks, advantages & disadvantages of mask.	05 Hrs
II	Filters & Vector Drawing Basics of filter, advantages of filter, types of filter: Blur, Distort, Noise, Pixelate, Render, Sharpen, stylize, filter gallery, filter Effects, Liquify, Smart filters.Painting tools : brush, blending modes, Pencil tool, Eraser,	05 Hrs

	magic eraser, background eraser, History, Art History, import brush pattern, gradients, Raster Vs Graphics, shape layer, pen tool, anchor points, path, types of path, selection using path.	
III	Prototype design Website layout design, Units, Design Principles, transformation, UI Elements, wireframes, Website components: header, navigation bars, web banner design, Box model, content sections, footer, Flyer design, Business card design , brochure design etc.	**05 Hrs**

Text Book

1. Adobe Photoshop CC Classroom in a Book by Andrew Faulkner.

IT/VSC/P/ 226: Practical based on IT/VSC/T/ 200 (Graphics Designing)	
Total Credits : 01 Maximum Marks : 50	Hours : 30 Hrs
Sample List of experiments to be carried out based on the course IT/VSC/T/ 200	
1	Create a clipping mask effect for multiple images
2	Design collage template using transformations
3	Create a passport sizes photographs using patterns
4	Design 2D background.
5	Design creative background using gradient, texture and patterns
6	Design perspective wallpaper using vanishing point filter
7	Design Neon Glow Effect using layer styles.
8	Design different types of Brochures, flyers, Business cards.
9	Design Website layout using Artboards
10	Design mobile app screens using Artboards.

IT/VSC/T/201: UX Designing

Total Credits : 01 Hours : 15 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand the fundamentals, need, and value of User Experience Design (UXD).
2. Identify and debunk common myths and misunderstandings about UXD.
3. Explore and apply UX laws and design principles in the context of user-centric design.
4. Analyze user needs and define problems through structured UX approaches and elements.
5. Conduct effective user research using interviews, surveys, contextual inquiry, and focus groups.
6. Develop user personas, empathy maps, and journey maps to represent user behavior and expectations.
7. Apply principles of information architecture for organizing and structuring content effectively.
8. Design and differentiate between wireframes and prototypes for digital product development.
9. Conduct usability testing and integrate user feedback to improve design deliverables.

Course Outcomes (COs) :

After successfully completing this course, students will be able to:

CO1: Explain the key concepts, myths, characteristics, and benefits of User Experience Design (UXD).

CO2: Apply UX laws and design principles in defining and solving user-centric problems.

CO3: Perform user research using techniques such as interviews, surveys, contextual inquiries, and card sorting.

CO4: Develop detailed user personas, empathy maps, and journey maps to support design decisions.

CO5: Organize digital content using Information Architecture principles for enhanced usability.

CO6: Create effective wireframes and prototypes for digital interfaces, distinguishing between the two clearly.

CO7: Conduct usability testing to evaluate design effectiveness and gather actionable feedback.

CO8: Deliver better UX design outcomes by iterating on user feedback and testing results.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Definition Experience Design, UXD Myths, Need of User Experience Design, UX Laws, Advantages of UXD, Approach, UXD Elements, characteristics of UXD.	05 Hrs
II	Define the problem, generating ideas, User Research techniques: User interviews, Contextual inquiry, survey, focus group, card sorting, User Personas, Empathy map, Journey map.	05 Hrs
III	Information Architecture, Better Deliverables, Defining to Design, Design principles, Information Architecture, Wireframing, Prototyping, wireframe vs Prototype Usability Testing, feedback system.	05 Hrs

Reference Book

1. UNDERCOVER User Experience Design by Cennyddbowles and James Box, New Riders
2. A Project Guide to UX Design by Russ Unger and Carolyn Chandler, New Riders
3. The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques, by Wilbert O. Galitz, WILEY

IT/VSC/P/ 227: Practical based on IT/VSC/T/201 (UX Designing)	
Total Credits : 01 Maximum Marks : 50	Hours : 30 Hrs
Sample List of experiments to be carried out based on the course IT/VSC/T/201	
1	Write five features of any mobile app.
2	Design Empathy map for Electronic shop.
3	Write User Persona for Designing E-Commerce Website.
4	Write Journey Map for Traveling app.
5	Create wireframe structure for mobile app.
6	Create Information Architecture for E-Commerce Website.
7	Create research document using card sorting method.
8	Create research document using interview method.
9	Design Landing Page Wireframe design for website.
10	Design Responsive layout Wireframe structure for an social media app.

B. Voc. ITSSD
Semester - IV

IT/DSC/T/250: Adv. DBMS SQL and Adv. Networking

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand SQL data types, primary keys, null and not null values, and auto-increment functionality.
2. Use SQL clauses and conditional statements for querying data effectively.
3. Apply comparison operators, logical operators, and pattern matching using wildcards.
4. Work with column value comparisons, distinct selections, and filtering top values from datasets.
5. Utilize date and string functions to manipulate and retrieve formatted results.
6. Apply aggregate functions for summarizing data (e.g., SUM, AVG, COUNT).
7. Create and manage SQL views with check options.
8. Understand and implement basic triggers for data validation and automation.
9. Understand different network models (peer-to-peer, client-server, hybrid) and their use cases.
10. Identify and explain functions of key network protocols such as FTP, HTTP, DHCP, etc.
11. Recognize and describe network devices including switches, hubs, routers, and gateways.
12. Understand IP addressing schemes, formats, and classes.
13. Configure IP addresses on PCs and understand subnet addressing.

Course Outcomes (COs) :

CO1: Define and use various SQL data types, primary keys, and constraints like ULL/NOT NULL and auto-increment.

CO2: Construct SQL queries using WHERE clauses, multiple conditions, and logical /comparison operators.

CO3: Use wildcards for pattern matching, and retrieve distinct and top values from data tables.

CO4: Apply date and string functions for data manipulation and perform calculations using SQL functions.

CO5: Use aggregate functions and create simple SQL views with validation using check options.

CO6: Explain the purpose and implementation of SQL triggers for data integrity and automation.

CO7: Differentiate between various network models and describe how they function in real-world scenarios.

CO8: Identify network devices and protocols, and explain their role in data transmission and communication.

CO9: Describe and configure IP addressing schemes, including subnetting and address assignment on PCs.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	SQL Data Types, Primary Keys, Null values and Not Null Values, Auto Increment, Use the Where clause, Conditional statements, Multiple conditions, Comparison Operators, Logic Values, Null Values, Patterns also known as Wildcard characters, Compare Column Values, Distinct Values, Top Values, Date Functions, Date Calculations, Aggregate Functions, String Functions,	15 Hrs

	Create a Simple View With Check Option, Introduction to Triggers, Validating Triggers	
II	Network models: Peer-to-pee, protocol, client/ Server network and hybrid type network. Network protocols, DSN, FTP, Telnet, DHCP, HTTP, TFTP, SSH, SFTP, SMTP, POP, IMAP, NTP Network devices HUB, Switch, Repeater, Bridges, Routers, Gateway, IP address: Introduction, IP address format, classes of IP Address, subnet address, Configuration of IP Address in PC.	**15 Hrs**

Reference Books:

1. "Learning MySQL" by Seyed M.M. Tahaghoghi and Hugh E. Williams Publisher: O'Reilly Media
2. "MySQL Crash Course" by Ben Forta Publisher: Sams Publishing
3. Tannenbaum, A.S., 2003: Computer Networks, Prentice Hall.
4. Networking: The Complete Reference 1st Edition, Mcgraw Hill Education
5. Stallings, William, Local and Metropolitan Area Networks: Macmillan Publishing Co.
6. Black: Data Network, Prentice Hall of India.
7. CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
8. Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media

IT/DSC/P/ 226: Practical based on IT/DSC/T/250(Adv. DBMS and Adv. Networking)	
Total Credits : 02 Maximum Marks : 50	Hours : 60 Hrs
Sample List of experiments to be carried out based on the course IT/DSC/T/201.Teaching faculty may alter these practical as per the availability of resources and need of industry	
1.	Creating a Table with Various Data Types: Define a table using INT, VARCHAR, DATE, BOOLEAN, etc., Set PRIMARY KEY, NOT NULL, AUTO_INCREMENT constraints.
2.	Using WHERE Clause with Conditional and Logical Operators: Retrieve records using AND, OR, NOT, BETWEEN, IN, LIKE.
3.	Working with NULL, NOT NULL and Comparison Operators :Use IS NULL, IS NOT NULL, =, <>, <, > to filter data.
4.	Pattern Matching with Wildcards Use LIKE, %, _ to search for partial matches in string fields.
5.	Applying Aggregate Functions: Use COUNT(), SUM(), AVG(), MIN(), MAX() on relevant data.
6.	Using Date and String Functions: Work with NOW(), DATEDIFF(), CONCAT(), UPPER(), LOWER(), etc.
7.	Using DISTINCT, TOP, and Column Comparisons: Filter out duplicate entries, display top n rows using LIMIT.
8.	Creating Views with CHECK OPTION: Create a view that filters data and restricts updates outside the view scope.
9.	Creating and Validating Triggers: Write a BEFORE INSERT trigger to check conditions before inserting data.
10.	Configuring IP Address on a PC: Set up static IP, subnet mask, gateway, and test connectivity using ping.
11.	Identify and Describe Network Devices: Physically identify or diagram devices: hub, switch, router, bridge, gateway.
12.	Demonstrate Peer-to-Peer and Client-Server Network: Create a basic file-sharing P2P setup; simulate client-server using browser-server apps.
13.	Exploring Network Protocols Using Wireshark or Command-Line Tools: Observe usage of HTTP, FTP, DHCP, DNS, etc. during browsing or downloads.
14.	File Transfer using FTP and SFTP: Set up a local FTP server (e.g., FileZilla) and connect with a client to upload/download files.
15.	Create a Simple Network Topology: Using Packet Tracer or hardware, design and simulate a small LAN (Star/Bus/Ring topology).

IT/DSC/T/251: PHP Programming-I

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

To install and configure MySQL

- To install and configure Apache with PHP
- To create MySQL users and grant privileges
- To test PHP and MySQL installations
- To configure PHP

Course Outcomes (COs) :

After completion of this course, the learners will be able to:-

- Analyze the construction of a web page and relate how PHP and HTML combine to produce the web page.
- Compare and contrast PHP variable types, and relate the advantages and disadvantages of PHP variables with local or global scope.
- Formulate, design and create PHP control structures, including selection and iterative structures.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to PHP: What is PHP? Why PHP? Evolution of PHP. Installation: PHP on windows and Linux, Configuring: Apache & PHP, Running & Testing PHP Script, Combining PHP with HTML. PHP Language Basics: Building blocks of PHP: Variables, Data Types, Operators and Expressions and Constant. Decision within PHP: if , if.. else, if.. elseif .. else, switch, Ternary Operator Looping within PHP: *while, do...while, for, Break & Continue* statement	**10 Hrs**
II	Functions in PHP: What is function, why functions, Calling function, Returning Value from function, Recursive function. Arrays in PHP: What & Why Array Creating index based and Associative array Accessing array, Element Looping with Index based array, Looping with associative array using each () and foreach(), Some useful Library function. Objects in PHP: What is Class & Object, Creating a Class & Object, Object properties, object methods, Overloading, inheritance, Constructor and Destructor.	**10 Hrs**
III	String in PHP: Creating and Accessing String, formatting String, Searching String, Manipulating String. Date and Time: Understanding TimeStamp, Getting Date and time, Extracting values of date-time, Formatting date-time. Understanding file & directory, Opening and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading & Downloading	**10 Hrs**

Reference Books:

1) **Beginning PHP 5.3** , Author: Matt Doyle, Wiley Publishing, Inc.
2) **SAMS Teach yourself PHP in 24 hours,** Author: Matt Zandstra, Sams Publishing.
3) **"PHP, MySQL and Apache All in One"** , Author: Juliea C. Meloni, SAMS series

IT/DSC/P/277: Practical based on IT/DSC/T/251(PHP Programming-I)	
Total Credits : 02 Maximum Marks : 50	Hours : 60 Hrs
Sample List of experiments to be carried out based on the course IT/DSC/T/251	
1.	Write a PHP script to demonstrate arithmetic operators, comparison operator, and logical operator.
2.	Write PHP Script to print Fibonacci series.
3.	Write PHP Script to generate result and display grade.
4.	Write PHP script to obtain factorial of a number Using function
5.	Write PHP script to demonstrate string function.
6.	Write PHP script to demonstrate Date functions.
7.	Write PHP script to demonstrate Math functions.
8.	Write PHP script to demonstrate Array functions.
9.	Write PHP script to demonstrate File functions.
10.	Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.

IT/Mn/T/250: Campus to Corporate

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand essential business etiquette for corporate communication and behavior.
2. Learn ethical practices related to communication, confidentiality, and company resources.
3. Develop awareness of professional behavior, including dressing, conduct, and interpersonal interactions at the workplace.
4. Identify issues such as nepotism, discrimination, workplace bullying, and customer engagement with appropriate responses.
5. Explore the concepts of professional ethics, including personal vs. professional values, ethical dilemmas, and emotional intelligence.
6. Understand the nature of professionalism, professional roles, associations, accountability, and balancing ambition with ethics.
7. Gain insights into the transition from college to the corporate world, including expectations and preparation strategies.

Course Outcomes (COs) :

After successfully completing this course, students will be able to:

- **CO1:** Demonstrate appropriate business etiquette in verbal, written, and electronic communication within a corporate setting.
- **CO2:** Apply ethical principles related to workplace conduct, including confidentiality, use of company assets, and respect for others.
- **CO3:** Exhibit awareness of personal grooming, professional attire, and workplace decorum.
- **CO4:** Recognize and respond constructively to unethical practices like nepotism, discrimination, and bullying.
- **CO5:** Analyze ethical dilemmas and apply life skills and emotional intelligence in resolving professional conflicts.
- **CO6:** Understand the meaning of professionalism and the importance of professional accountability and integrity.
- **CO7:** Prepare for the transition from campus to corporate by aligning with employer expectations and industry standards.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Business Etiquettes, Etiquette Starts on the Phone, No Solicitation, Personal and Mass Emailing, Confidentiality and the Use of Company Funds and Equipment, Employee Theft – Though Shalt Not Steal	10 Hrs
II	Dressing for work Nepotism in the Workplace, Disturbances, Insensitivity and Discrimination, Office Bullying, Entertaining Customer Professional Ethics : Introduction, Terminology, Governing Edicts, Contextual Aspects, Personal Ethics, Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts on Ethics, Value Education, Dimensions of Ethics, Setting Goals in Life.	10 Hrs
III	Profession And Professionalism : Profession, Professional, Professionalism, Professional Associations, Roles of a Professional,	10 Hrs

	Professional Risks, Professional Accountability, Professional Success, Ambition and Satisfaction, Ethics and Profession, Image of a Profession Putting Things In Perspective: Introduction and Need for Transition, Corporate Expectations Scenario, Business Schools Scenario.	

Text Books

1. Campus to Corporate: Your Roadmap to Employability by Gangadhar Joshi

Reference Books:

1. Office Etiquette: The Unspoken Rules in the Workplace by Sonja L. Traxler
2. Campus To Corporate by Ashutosh Sharma.

IT/Mn/T/ 251: 2-D Designing using Photoshop

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1. Understand the fundamental concepts, features, and applications of Adobe Photoshop.
2. Recognize different image file formats, resolutions, and the relationship between image size and quality.
3. Apply principles of design and color theory in digital artwork.
4. Navigate and utilize the Photoshop workspace, toolbox, and interface effectively.
5. Develop proficiency in various selection tools and techniques for precise image editing.
6. Gain in-depth knowledge of layers, layer styles, masks, and their functional advantages.
7. Apply a range of filters and effects to manipulate images for creative outcomes.

Course Outcomes (COs) :

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

CO1: Explain the features, applications, and limitations of Photoshop software.

CO2: Identify and use different image file formats, resolutions, and design principles effectively in digital work.

CO3: Demonstrate mastery in using selection tools and advanced selection techniques for image editing.

CO4: Work with layers and masks proficiently to organize and enhance image compositions.

CO5: Apply and manage various filters and effects for image stylization and corrections.

CO6: Utilize painting and vector tools to create illustrations, patterns, and vector paths.

CO7: Design professional-level digital media assets including website layouts, business cards, flyers, and brochures.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Photoshop Basics & Art of Selection: Introduction, Features, Applications, Advantages & Limitations of Software, Image file formats, Resolution, Aspect ratio, image size, color theory, Design principles, Workspace, tool box. Selection tools: Marquee selection, lasso selection, Magic & Quick selection, and adjusting pixel selection, Selection techniques: edge refine, color range, Quick mask mode, transform, path selection. Layers and Mask: Layer basics, adding layer, duplicate layers, arrange layers, merge & group layers, sort layers, creating layer styles, locking layers, flatten layer, basics of mask, types of masks, advantages & disadvantages of mask.	10 Hrs
II	Filters & Vector Drawing Basics of filter, advantages of filter, types of filter: Blur, Distort, Noise, Pixelate, Render, Sharpen, stylize, filter gallery, filter Effects, Liquify, Smart filters. Painting tools : brush, blending modes, Pencil tool, Eraser, magic eraser, background eraser, History, Art History, import brush pattern, gradients, Raster Vs Graphics, shape layer, pen tool, anchor points, path, types of path, selection using path.	10 Hrs
III	Prototype design Website layout design, Units, Design Principles, transformation, UI Elements, wireframes, Website components: header, navigation bars, web banner design, Box model, content sections, footer, Flyer design, Business card design , brochure design etc.	10 Hrs

Text Books

1. Adobe Photoshop CC Classroom in a Book by Andrew Faulkner.

IT/GE/OE/T/250: Fundamental of Computer Network

Total Credits : 02 Hours : 30 Hrs

Maximum Marks : 50

Learning Objectives of the Course:

1.The main objective of this course is to make the student learn the design of computer networks.

Course Outcomes (COs) :

1. Understand Basics of Computer Networks and different Transmission Media.
2. Differentiate Protocols which play a major role in providing internet effectively.
3. Understand various protocol layers and inner operations.
4. Understand architectures of network protocols.
5. Understand security issues in network protocols.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	**NETWORK MODELS**: Layered Tasks, WAN, LAN, MAN, OSI model, TCP/ IP protocol stack, addressing ,Novell Networks Arpanet, Internet. **PHYSICAL LAYER**: Transmission media: copper, twisted pair, wireless; switching and encoding asynchronous communications; Narrow band ISDN, broad band ISDN and ATM. **DATA LINK LAYER**: Design issues, framing, error detection and correction, CRC, Elementary data link protocols, Sliding Window Protocol, Slip, HDLC, Internet, and ATM.	**10 Hrs**
II	**MEDIUM ACCESS SUB LAYER**: Random access, Controlled access, Channelization, IEEE 802.X Standards, Ethernet, wireless LANS, Bridges. **NETWORK LAYER**: Network Layer Design Issues, Routing Algorithms, Internetworking, Network Layer in Internet. (Text book- **CONGESTION CONTROL**: General Principles, policies, traffic shaping, flow specifications, Congestion control in virtual subnets, choke packets, loads shedding, jitter control.	**10 Hrs**
III	**TRANSPORT LAYER**: Transport Services, Elements of Transport Protocols, Internet Transport Protocols (TCP & UDP); ATM AAL Layer Protocol. **APPLICATION LAYER**: Network Security, Domain name system, SNMP, Electronic Mail: the World WEB, Multi Media	**10 Hrs**

Text Books

1. Andrew S Tanenbaum: Computer Networks ,6th Edition. Pearson Education/PI, 2012.
2. Behrouz A. Forouzan : Data Communications and Networking, 4 th Edition TMH, 2012.

Reference Books:

1 . S.Keshav: An Engineering Approach to Computer Networks, 2nd Edition, Pearson Education, 2001.
2. William, A. Shay : Understanding communications and Networks, 3rd Edition, Thomson Publication, 2006

IT/SEC/T/250: Advance Excel

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

Learning Objectives of the Course:

1. Understand and apply a wide range of Excel functions including logical, financial, statistical, text, date, and lookup functions.
2. Use **conditional formatting**, **IF statements**, and color-coding to modify and enhance data visualization.
3. Analyze and organize data using tools like **sorting**, **filtering**, **subtotals**, **data validation**, **goal seek**, and **what-if analysis**.
4. Develop skills in creating **charts**, **graphs**, and **pivot tables/charts** for effective data representation.
5. Apply advanced techniques such as **cell referencing**, **name definition**, **sheet protection**, and **freezing panes** for efficient workbook management.
6. Utilize **LOOKUP functions with IFERROR**, **paste special**, and **advanced number formatting** to manage data accuracy.
7. Record and run **macros** to automate repetitive tasks.
8. Integrate **AI tools in Excel** to improve productivity, including **Power Query** for cleaning data and **AI-based formula recommendations**.

Course Outcomes (COs) :

After completing the course, students will be able to:

- **CO1:** Use advanced Excel functions to perform logical, statistical, financial, and text-based operations.
- **CO2:** Apply formatting and visualization tools like conditional formatting and charts to enhance data readability.
- **CO3:** Organize and analyze large datasets using sorting, filtering, validation, and what-if tools.
- **CO4:** Create dynamic and insightful reports using pivot tables and pivot charts.
- **CO5:** Manage workbooks effectively through naming cells, protecting sheets, and freezing panes.
- **CO6:** Use Power Query for cleaning datasets, including removing duplicates and handling missing values.
- **CO7:** Develop and use macros to automate Excel processes and reduce manual effort.
- **CO8:** Apply AI-driven suggestions for formula generation and data analysis

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Working with Functions & Formulas Basic Functions, Lookup Functions, Logical If Functions, Financial Functions, Statistical Functions, Maths & Trigonometry Functions, Text Functions, Date Functions, Logical Functions. Modifying worksheets with colour, Conditional Formatting and IF Conditions & Charts.	05 Hrs
II	Analysing Data: Subtotal, Sorting Data, Filtering Data, Data Validation, Goal Seek, What if Analysis, Cell References Formulas, Define Name, Protect Workbook & Worksheet. Freeze Panes.	05 Hrs
III	Charts & Graphs, Pivot Table & Pivot Chart, Lookup Functions with IF Error, Paste Special & Advance Number, Macros, Benefits of integrating AI with Excel, Removing duplicates and handling missing values with Power Query, Using AI suggestions for formula creation	05 Hrs

Reference Books:

1. Microsoft Excel 2021 Bible by Michael Alexander, Richard Kusleika, John Walkenbach
2. Excel 2021 Formulas and Functions by Paul McFedries

IT/SEC/P/ 276: Practical based on IT/DSC/T/250(Advance Excel)	
Total Credits : 02 Maximum Marks : 50	Hours : 60 Hrs
Sample List of experiments to be carried out based on the course BIT/VSC/T/201	
1	Basic Formulas and Functions : Use SUM, AVERAGE, MIN, MAX, and COUNT on a dataset of sales figures.
2	Logical Functions (IF, AND, OR): Create a salary grade system using IF, AND, OR to categorize employees as "Low", "Medium", "High" based on multiple conditions.
3	Lookup Functions (VLOOKUP, HLOOKUP, XLOOKUP, INDEX-MATCH) Create a student database and use lookup functions to extract details based on student IDs.
4	Financial Functions: Calculate EMI for various loans using PMT, FV, and RATE.
5	Statistical Functions: Use STDEV, VAR, MEDIAN, MODE on employee performance scores.
6	Date and Time Functions: Calculate age, tenure, or invoice due date using TODAY(), DATEDIF(), EDATE(), NOW().
7	Text Functions: Clean a messy dataset using TRIM, UPPER, PROPER, LEFT, RIGHT, CONCAT, TEXTJOIN.
8	Conditional Formatting and IF Conditions: Highlight sales above targets and attendance below 75% using rules and formulas in conditional formatting.
9	Charts & Graphs: Create Column, Line, and Pie charts for monthly sales.
10	Pivot Table & Pivot Chart: Summarize sales data by region, product, and salesperson. Create corresponding Pivot Charts.
11	Subtotal, Sort, and Filter: Use Subtotal to calculate grouped totals, then sort and filter a product inventory.
12	Data Validation and What-if Analysis: Create drop-down lists and restrict input. Use Goal Seek to reach a target profit value.
13	Freeze Panes, Cell Referencing, Define Names: Work on a large sheet, freeze rows/columns, use A1 vs. A1, and define names for formulas.
14	Macros and Paste Special: Record a macro to format a table and automate repetitive formatting. Use Paste Special to copy only values or formats.
15	Power Query & AI Integration: Import a CSV, remove duplicates, handle missing values, and use Excel's AI formula suggestions to complete a calculation.

IT/SEC/T/ 251: UI Designing

Total Credits : 01 Hours : 15 Hrs

Maximum Marks : 50

Learning Objectives of the Course

1. Understand the fundamentals of User Interface (UI) design and the importance of good user experience.
2. Explore key design principles including color theory, typography, screen layout, and visual hierarchy.
3. Develop proficiency in working with UI design software interfaces, including layers, components, guides, and styles.
4. Create professional screen designs with consistent visual language using vector graphics, reusable assets, and effects.
5. Build interactive prototypes with navigation, overlays, scrolling areas, and hyperlinks.
6. Apply animation and transitions to improve UI/UX flow across screens.
7. Design responsive layouts suitable for web and mobile applications.
8. Export assets and prototypes for development and presentation.

Course Outcomes (COs) :

After successful completion of the course, students will be able to:

- **CO1:** Explain the principles of effective user interface design and the role of good visual communication.
- **CO2:** Apply color theory, typography, and imagery effectively in screen and layout design.
- **CO3:** Utilize workspace tools to align, distribute, and manage UI elements across layers and frames.
- **CO4:** Create and reuse components for scalable and consistent UI design.
- **CO5:** Build interactive prototypes with functional links, scrollable areas, overlays, and navigation.
- **CO6:** Export individual assets, artboards, and complete prototypes for presentation or developer handoff.
- **CO7:** Implement animation techniques and transitions to enhance interactivity and user experience.
- **CO8:** Design mobile app interfaces using best practices in usability and responsive design.

Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Defining the User Interface, Importance of good design, Graphical User Interface, Screen Design, color theory, Typography, Imagery, Principals of Design.	10 Hrs
II	Workspace of Software, designing on a Layout Guide Adding Text Creating colored backgrounds for text columns, importing vector graphics Aligning & distributing layers Layer opacity vs. fill opacity Reusing colours (color styles) Adding a drop shadow, Creating & editing components, overriding content in one instance vs. globally updating all components, linking between frames (artboards) Previewing the prototype Creating an overlay.	10 Hrs
III	Exporting individual assets Exporting frames (artboards), Making Links that Scroll Up/Down a Page Making the Navbar Fixed to the Screen Adjusting the Position & Speed of the Scroll Creating a Scrollable Area Within a Page Adding Hyperlinks, creating animations and liking screens, design mobile app.	10 Hrs

Text Book

1. Designing and Prototyping Interfaces with Figma (English, Paperback, Staiano Fabio)

IT/SEC/P/ 277: Practical based on IT/SEC/T/ 251 (UI Designing)	
Total Credits : 01 Maximum Marks : 50	Hours : 30 Hrs
Sample List of experiments to be carried out based on the course IT/SEC/T/ 251	
1	Design different styles of login page design.
2	Create a Wireframe for a Landing Page
3	Design a Mobile App Home Screen
4	Create a Mobile App Icon Set
5	Design animated mobile app splash screen
6	Design an E-commerce Product Detail Page
7	Design a Blog Article Page Layout
8	Design a Responsive Dashboard
9	Design mobile app screens with page scrolling and animation.
10	Design Website pages with scrolling and animation.