Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
CHHATRAPATI SAMBHAJINAGAR.

CIRCULAR NO.SU/ Sci./College/NEP-2020/105/2024

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

Sr.No.	Courses	Semester
1	Non Conventional & Conventional Enery (Single Major)	Ist and IInd semester
2	Home Science (Single Major)	Ist and IInd semester
3	Bachelor of Computer Application (Single Major)	Ist and IInd semester
4	Computer Science (Single Major)	Ist and IInd semester
5	Data Science (Single Major)	Ist and IInd semester
6	Inforamtion Technology (Single Major)	Ist and IInd semester
7	Networking and Multimedia (Single Major)	Ist and IInd semester
8	Automobile Technology (Single Major)	Ist and IInd semester
9	Forensic Science (Single Major)	Ist and IInd semester
10	Forensic Science & Cyber Security (Single Major)	Ist and IInd semester

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

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

University Campus,
Chhatrapati Sambhajinagar
-431 004.
Ref.No. SU/Sci./2024/27121-28
Date:-27.05.2024.

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Deputy Registrar,
Academic Section.

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Copy forwarded with compliments to :-

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

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

Copy to :-

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

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

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

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

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

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

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

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

Chh. Sambhajinagar

FACULTY OF SCIENCE & TECHNOLOGY

3 Years/4 Years B.Sc. (Hons.) &

4 Years B.Sc. (Hons. with Research) Programme

Revised

Course Structure and Syllabus

Subject: Networking and Multimedia

(Single Major)

(Effective from 2024-25)

PREFACE

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

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

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

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

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

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

Programme Educational Objectives (PEOs) :

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

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

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

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

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

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

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

Programme Outcomes (POs) :

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

- **PO1. The citizenship and society:** Apply broad understanding of ethical and professional skill in science subjects 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 science subjects 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 science subject related problems within positive professional and ethical boundaries.

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

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

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

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

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 OBJECTIVES (PSOs)

PSO1: Understand the fundamental concepts of computer networks, including protocols, architectures, and communication models.

PSO2: Design, configure, and troubleshoot network infrastructures, including LANs, WANs, and wireless networks.

PSO3: Gain proficiency in multimedia design principles, including graphics, animation, audio, and video production.

PSO4: Collaborate with interdisciplinary teams to create multimedia solutions that meet client requirements and project objectives.

PSO5: Stay updated with emerging networking technologies and standards to adapt to evolving industry trends.

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

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

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

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

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

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

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

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

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

5) **AEC** (Ability Enhancement courses): The focus of these courses should be based on linguistic and communication skills. In first semester it will be English and will be common for all the faculty.

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

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

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

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

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

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

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

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

AS PER NEP 2020

Illustrative Credit distribution structure for three/ fours year Honours/ Honours with Research Degree Programme with Multiple Entry and Exit options – (Discipline Specific Core in –Networking and Multimedia)

Class: B.Sc. First Year

Semester: I[st] Semester

Subject: Networking and Multimedia

Course type	Course Code	Course Name	Teaching Scheme (Hrs./ week)		Credits Assigned		Total Credits
			Theory	Practical	Theory	Practical	
Major (Core) M1 Mandatory	N&M|DSC1|T100	Fundamentals of Computer Networks	2	-	2	-	4+4+4=12
	N&M|DSC1|P100	Practical based on Fundamentals of Computer Networks		4		2	
Major (Core) M2 Mandatory	N&M|DSC2|T101	Introduction to Multimedia	2	-	2	-	
	N&M|DSC2|P101	Practical based on Introduction to Multimedia		4		2	
Major (Core) M3 Mandatory	N&M|DSC3|T102	Introduction to Operating System	2	-	2		
	N&M|DSC3|P102	Practical based on Introduction to Operating System	-	4		2	
Generic Electives (GE) /Open Elective (OE) (Choose any one from pool of courses)	GE/OE-1	To be chosen from other faculty	2	-	2	-	2
SEC (Skill Enhancement Courses) (Choose any one from pool of courses)	N&M|SEC1|T120-T121	Office automation Part I **OR** PC Assembling	1	-	1	-	2
	N&M|SEC1|P120-P121	Practical based on Office automation Part I **OR** Practical based on PC Assembling		2		1	

AEC,VEC,IKS Ability Enhancement Course	AEC-1	English (Common for all the faculty)	2		2		2+2=04
	IKS-1	Choose any one from pool of courses	2		2		
OJT,FP,CEP, CC,RP	CC– 1	Health and wellness (Common across faculty)	-	4	-	2	02
			13	18	13	09	22 credits

GE/OE-1 : Introduction to Google Workspace-Part1(This course will be available for the students from other faculty)

Class: B.Sc. First Year: Networking and Multimedia
First Semester:

1. Major (Core) subject are mandatory :
   DSC-1: Fundamentals of Computer Networks,
   Practical Based on DC1
   DSC-2: Introduction to Multimedia,
   Practical Based on DC2
   DSC-3: Introduction to Operating System,
   Practical Based on DC
2. GE/OE-1: (Choose any one from Pool /Basket)
3. SEC-1: (Choose any one from Pool /Basket)
   1: Office automation Part-I
   Practical based on Office automation Part-I
   Or
   2: PC Assembling
   Practical based on PC Assembling
4. AEC-1: English – common to all faculty
5. IKS-1: **:** ----------(common to all faculty)
6. CC-1: Health and Wellness (common to all faculty)

Note : Theory papers are designated as (Starts with) T and Practical papers are designated as(Starts with) P

Class: B.Sc. First Year
Semester: II[nd] Semester
Subject: Networking and Multimedia

Course type	Course Code	Course Name	Teaching Scheme (Hrs./week)		Credits Assigned		Total Credits
			Theory	Pract.	Theory	Pract.	
Major (Core) M1 Mandatory	N&M/DSC4/T150	Advance Computer Networks	2	-	2	-	4+4+4=12
	N&M/DSC4/P150	Practical based on Advance Computer Networks	-	4	-	2	
Major (Core) M2 Mandatory	N&M/DSC5/T151	Design of Multimedia System	2	-	2	-	
	N&M/DSC5/P151	Practical based on Design of Multimedia System		4		2	
Major (Core) M3 Mandatory	N&M/DSC6/T152	Database Management System	2	-	2		
	N&M/DSC6/P152	Practical based on Database Management System		4		2	
Generic Electives (GE) /Open Elective (OE) (Choose any one from pool of courses)	GE/OE-2	To be chosen from other faculty	2	-	2	-	2
VSC (Choose any one from pool of courses)	N&M/VSC1/T164-T166	Programming using C++ Part I OR Programming using Java Part I	1	-	1		2
	N&M/VSC1/P164-T166	Practical based on Programming using C++ Part I OR Practical based on Programming using Java Part I	-	2	-	1	

AEC,VEC,IKS Ability Enhancement Course	AEC-2	– English (Common across faculty)	2	-	2	-	2+2=04
	VEC-1	(Constitution of India) (Common across faculty)	2	-	2	-	
OJT,FP,CEP, CC,RP (Choose any one from pool of courses)	CC-2	(Yoga education/sports and fitness (Common across faculty)	-	4	-	2	2
			13	18	13	09	22 credits
Exit option : Award of UG Certificate in major with 44 credits and an additional 4 credits core NSQF course /Internship or continue with Major and Minor							

GE/OE-2 : Introduction to Google Workspace-Part-II(This course will be available for the students from other faculty)

Class: B.Sc. First Year

Semester: II Semester

Subject : Networking and Multimedia

Second Semester:

1. Major (Core) subject are mandatory :
   DSC-4: Advance Computer Networks
   Practical based on DSC-4
   DSC-5: Design of Multimedia System
   Practical based on DSC-5
   DSC-6: Database Management System
   Practical based on DSC-6
2. GE/OE-2: (Choose any one from Pool /Basket)
3. VSC-1: (Choose any one from Pool /Basket)

1: Programming using C++ Part I

Practical based on Programming using C++ Part I

2: Programming using Java Part I

Practical based on Programming using Java Part I

3: Programming using Python Part I

Practical based on Programming using Java Part I

4. AEC-2: English Communication (common to all faculty)

5. VEC-1: Constitution of India (common to all faculty)
6. CC-2: Yoga education/ Sports and fitness (common to all faculty)

Note : Theory papers are designated as (Starts with) T and Practical papers are designated as(Starts with) P

Detail contents of courses

Class: B.Sc. First Year
Semester: I[st] Semester
Subject: Networking and Multimedia

Course No. (N&M|DSC1|T100) Fundamentals of Computer Networks

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| DSC1| T100**	DSC-1	Theory	2	2	30		----	----	----

Title of the Course (N&M|DSC1|T100) Fundamentals of Computer Networks

Learning Objective:

i. Understand network topologies, transmission methods, and networking devices for efficient network design and management.
ii. Master digital data transmission, modem standards, and networking models to ensure reliable data communication.
iii. Apply IP addressing, DNS configuration, server deployment, and protocol knowledge for effective network administration.
iv. Analyze network protocols, including routing, FTP, HTTPS, UDP, and wireless protocols, to optimize network performance and security.

Course Outcome (CO):

After completion of course students will be able to:

CO1: - To familiarize the student with the basic taxonomy and terminology of computer networks.

CO 2: - To understand data transmission across the network.

CO3: -To prepare the student for advanced courses in computer networking.

CO4:-Discuss various protocols such as routing, FTP, HTTPS, UDP, and wireless protocols used in networking.

Fundamentals of Computer Networks	Total Hrs: 30
Unit-I	**10 hrs**
Introduction to Computer Networking: Introduction to Networking Concepts: Network topologies and types of networks LAN, WAN, MAN, PAN, CAN. Network adapters, Introducing protocols, Introduction to various networking devices: Routers, Switches, Modems, Hubs etc. Wired and Wireless technology. Transmission media, modes of transmission. Introduction to Networking (access networks, physical media, delay and loss, layered architecture)	
Unit-II	**10 hrs**
Transmission of Digital Data ,Analog and Digital, digital data transmission – parallel transmission, serial transmission, data circuit terminating equipment, standards, modems- Transmission rate, Modem standards. Networking Model: The OSI model, TCP/ IP Model.	
Unit-III	**10 hrs**
Identifying Network Classes, obtain register IP address, How DNS and host table work, Types of servers. Various protocols: Routing, FTP, HTTPS, UDP, Wireless Protocols	

Textbooks:

1. "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross
2. "Data Communications and Networking" by Behrouz A. Forouzan
3. "Networking Essentials" by Jeffrey S. Beasley and Piyasat Nilkaew
4. "Computer Networks: A Systems Approach" by Larry L. Peterson and Bruce S. Davie

Reference Books:

1. "TCP/IP Illustrated, Volume 1: The Protocols" by W. Richard Stevens
2. "Network Warrior" by Gary A. Donahue
3. "CCNA Routing and Switching Official Cert Guide" by Wendell Odom
4. "DNS and BIND" by Cricket Liu
5. "Wireless Communications and Networks" by William Stallings
6. "Computer Networking Problems and Solutions" by Russ White and Ethan Banks
7. "Understanding Network Protocols" by Eric Hall

Course No. (N&M|DSC1|P100) Practical based on Fundamentals of Computer Networks

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| DSC1| P100**	DSC-1	Practical	2	4	60		----	----	----

Title of the Course (DSC-1): Practical based on Fundamentals of Computer Networks

Learning Objectives:

i. Understand network topologies, transmission methods, and protocols.

ii. Gain proficiency in configuring and troubleshooting networking devices.

iii. Master IP addressing, DNS, and server configurations.

iv. Develop skills in network design, security, and performance optimization.

Course Outcome (CO):

After completion of course students will be able to:

CO1: To analyze and implement various network topologies and transmission methods.

CO2: To demonstrate proficiency in configuring and troubleshooting networking devices and protocols.

CO3: To exhibit mastery in IP addressing, DNS, server configurations, and network security measures.

CO4: To develop the ability to design, optimize, and secure network infrastructures for different organizational needs.

Practical based on Fundamentals of Computer Networks	**Total Hrs: 60**
i. Setting up a LAN network using Ethernet cables and switches. ii. Configuring a wireless network with a router and access points. iii. Analyzing network topologies using network diagramming tools. iv. Testing data transmission rates using different modems.	

v. Configuring DHCP and DNS servers on a network. vi. Implementing port forwarding and firewall rules on a router. vii. Troubleshooting network connectivity issues using command-line tools. viii. Capturing and analyzing network traffic using packet sniffing software. ix. Setting up a VPN (Virtual Private Network) for secure remote access. x. Configuring Quality of Service (QoS) settings for prioritizing network traffic. xi. Conducting a penetration test to assess network security vulnerabilities. xii. Configuring file sharing and FTP services on a server. xiii. Implementing VLANs (Virtual LANs) for network segmentation. xiv. Setting up a web server and configuring HTTPS encryption. **xv.** Configuring and testing UDP (User Datagram Protocol) communication.	

Course No. (N&M|DSC2|T101): Introduction to Multimedia

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| DSC2| T101**	DSC-2	Theory	2	2	30		----	----	----

Title of the Course (N&M|DSC2|T101)): Introduction to Multimedia

Learning Objective:

i. Understand the components of multimedia, including audio, video, text, and graphics.
ii. Explore web and internet multimedia applications and their functionalities.
iii. Learn about the transition from conventional media to digital media and its impact on multimedia production.
iv. Gain knowledge of computer fonts, hypertext usage, audio fundamentals, and representation techniques in multimedia.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : It will provide an understanding of the fundamental elements in multimedia.

CO 2: Summarize the key concepts in current multimedia technology

CO 3: Create quality multimedia software titles.

CO4: To develop skills in using computer fonts, hypertext, audio fundamentals, and representation techniques to enhance multimedia projects.

Introduction to Multimedia	Total Hrs: 30
Unit-I	**10 hrs**
Introduction to Multimedia: What is multimedia Components of multimedia, Web and Internet multimedia applications. Transition from conventional media to digital media. Computer Fonts and Hypertext :Usage o f text in Multimedia, Families and faces of fonts, outline fonts, bitmap fonts, International character sets and hypertext, Digital fonts techniques	
Unit-II	**10 hrs**
Audio fundamentals and representations: Digitization of sound, frequency and bandwidth, decibel system, data rate, audio file format, Sound synthesis, MIDI, wavetable.	
Unit-III	**10 hrs**
Compression and transmission of audio on Internet, Adding sound to your multimedia project, Audio software and hardware.	

Textbooks:

1. "Multimedia: Making It Work" by Tay Vaughan
2. "Introduction to Multimedia Systems" by Anand Paul and Vinod M. V
3. "Multimedia Basics" by Herbert J. Shneiderman and Catherine Plaisant
4. "Multimedia: Computing, Communications & Applications" by Ralf Steinmetz and Klara Nahrstedt

Reference Books:

1. "The Multimedia Handbook" by Borko Furht and Ocean Tsai
2. "Multimedia Systems" by Yannis P. Papadopoulos and Mohamed S. Elgamel
3. "Understanding Digital Signal Processing" by Richard G. Lyons
4. "Audio Engineering Explained" by Douglas Self

5. "Introduction to Audio Analysis: A MATLAB® Approach" by Theodoros Giannakopoulos and Aggelos Pikrakis
6. "Multimedia Technology and Applications" by David Hillman
7. "Multimedia Computing: Preparing Multimedia for the Web" by Anthony P. Cornelius

Course No. (N&M|DSC2|P101): Practical based on Introduction to Multimedia

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| DSC2| P101**	DSC-2	Practical	2	4	60		----	----	----

Title of the Course (N&M|DSC2|P101)): Practical based on Introduction to Multimedia

Learning Objective:

i. Gain practical experience in creating multimedia projects using a variety of media elements.
ii. Develop proficiency in audio editing, compression, and integration techniques for multimedia applications.
iii. Understand the impact of typography and hypertext on multimedia design and user interaction.
iv. Acquire skills in evaluating and optimizing multimedia content for different platforms and audiences.

Course Outcome (CO):

After completion of course students will be able to:

CO1: To be able to create engaging multimedia presentations incorporating various media types.
CO2: Will be demonstrating proficiency in using multimedia authoring tools and web technologies.
CO3: Will be acquiring knowledge and skills in audio production and manipulation for multimedia purposes.
CO4: Will be develop problem-solving abilities related to audio optimization and integration in multimedia projects.

Practical based on Introduction to Multimedia	**Total Hrs: 60**
i. Creating a multimedia presentation using software like PowerPoint or Prezi, incorporating audio, video, text, and graphics.	

ii.	Converting analog media (e.g., VHS tapes) to digital formats and editing them for multimedia projects.	
iii.	Experimenting with different font families and styles to understand their impact on multimedia design.	
iv.	Creating interactive hypertext documents using hyperlinks, anchors, and navigation menus.	
v.	Recording and editing audio using digital audio workstations (DAWs) like Audacity or Adobe Audition.	
vi.	Understanding sound synthesis techniques and creating synthetic audio elements for multimedia.	
vii.	Exploring MIDI (Musical Instrument Digital Interface) and creating MIDI-based music compositions.	
viii.	Learning about audio compression techniques (e.g., MP3, AAC) and applying them to reduce file size.	
ix.	Experimenting with audio streaming protocols (e.g., HTTP Live Streaming) for online multimedia delivery.	
x.	Adding voiceovers or narration to multimedia projects and synchronizing them with visuals.	
xi.	Using audio hardware such as microphones, mixers, and sound cards for recording and playback.	
xii.	Converting audio files between different formats such as WAV, MP3, and MIDI.	
xiii.	Designing interactive multimedia interfaces with audio feedback and user-controlled sound options.	
xiv.	Troubleshooting audio synchronization issues and latency problems in multimedia playback.	
xv.	Experimenting with surround sound and spatial audio techniques for immersive multimedia experiences.	

Course No (N&M|DSC3|T102) :Introduction to Operating System

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| DSC3| T102**	DSC-3	Theory	2	2	30		----	----	----

Title of the Course (N&M|DSC3|T102)): Introduction to Operating System

Learning Objectives:

i. Understand the functions and structures of operating systems, including their history and evolution.
ii. Explore process and thread concepts, scheduling criteria, algorithms, and evaluation methods.
iii. Learn about process scheduling techniques, process synchronization, and the critical-section problem.
iv. Develop skills in system calls, protection, security, and distributed systems within operating environments.

Course Outcome (CO):

After completion of course students will be able to:

CO1: Understanding the role of operating system with its function and services.

CO2: Able to analyze Process scheduling algorithm

CO3: Understand the concept on Memory management and able to compare various memory management techniques.

CO4: To demonstrate proficiency in process and thread management, including scheduling algorithms and evaluation criteria.

Introduction to Operating System	Total Hrs: 30
Unit-I	**10 hrs**
Operating System: Operating Systems Overview- Overview and Functions of operating systems, protection and security, distributed systems, operating Systems structures, services, system calls and their working. History and generation of operating system.	
Unit-II	**10 hrs**
Process and Threads: Process and Threads - Process concepts, threads, scheduling-criteria, Algorithms, and their evaluation.	
Unit-III	**10 hrs**
Process Scheduling, Scheduling. Process synchronization, critical- section problem.	

Textbooks:

1. "Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne
2. "Operating Systems: Principles and Practice" by Thomas Anderson and Michael Dahlin
3. "Modern Operating Systems" by Andrew S. Tanenbaum and Herbert Bos
4. "Operating Systems: Internals and Design Principles" by William Stallings

Reference Books:

1. "Operating Systems: A Modern Approach" by S. R. Das
2. "Operating Systems: A Design-Oriented Approach" by Charles Crowley
3. Operating Systems. A.S. Godbole.2nd Edition, TMH
4. "Advanced Concepts in Operating Systems" by Mukesh Singhal and Niranjan Shivaratri
5. "Operating System Design: The Xinu Approach" by Douglas Comer
6. "Modern Operating Systems: Global Edition" by Andrew S. Tanenbaum and Herbert Bos
7. Operating systems- A Concept based Approach-D.M.Dhamdhere. 3rd Edition.TMH

Course No. (N&M|DSC3|P102): Practical based on Introduction to Operating System

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| DSC3| P102**	DSC-3	Practical	2	4	60		----	----	----

Title of the Course (N&M|DSC3|P102)): Practical based on Introduction to Operating System

Learning Objective:

i. Gain hands-on experience in installing and configuring various operating systems to understand their functionalities and differences.
ii. Develop practical skills in process and thread management, including inter-process communication and synchronization techniques.
iii. Implement CPU scheduling algorithms and memory management strategies to optimize system performance and resource utilization.
iv. Design and implement distributed systems and security measures to ensure reliable and secure data communication.

Course Outcome (CO):

After completion of course students will be able to:

CO1:Demonstrate proficiency in system administration tasks such as user management, file system organization, and network configuration.

CO2:Apply process and thread concepts to create efficient and responsive software applications, evaluating their performance using simulation tools.

CO3:Evaluate and compare CPU scheduling algorithms, memory management techniques, and distributed system architectures based on practical implementations.

CO4: Implement security measures and protocols to protect data integrity and confidentiality in distributed environments, analyzing potential vulnerabilities and mitigating risks.

Practical based on Introduction to Operating System	**Total Hrs: 60**
i. File system management and organization, including disk partitioning and formatting. ii. User and group management, permissions, and access control. iii. Network configuration and firewall setup for security. iv. Implementation of encryption techniques for data protection.	

v.	Analysis of operating system structures (monolithic, microkernel, hybrid).	
vi.	Monitoring system performance and resource utilization.	
vii.	Understanding system services such as process management and memory allocation	
viii.	Creation and management of processes using system calls	
ix.	Implementation of inter-process communication mechanisms (pipes, shared memory).	
x.	Multi-threading concepts and thread creation in programming languages like C/C++ or Java or python .	
xi.	CPU scheduling algorithms simulation (FCFS, SJF, Round Robin) and performance analysis.	
xii.	Deadlock detection and prevention strategies.	
xiii.	Memory management techniques (paging, segmentation) and virtual memory implementation.	
xiv.	Performance evaluation of multi-threaded applications.	
xv.	Real-time scheduling algorithms and their impact on system responsiveness.	

Course No(N&M|SEC1|T120): Office Automation Part-I

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| SEC1|T 120**	SEC1	Theory	1	2	15		----	----	----

Learning Objective:

i. Learn to create, format, and save documents using MS Word, including text formatting, spell checking, and printing functionalities.

ii. Understand the basics of mail merge and table creation in MS Word for efficient document management.
iii. Gain proficiency in creating and saving databases in MS Access, utilizing them as backends for applications.
iv. Develop skills in creating and using Excel sheets, including the use of various formulas for calculations and data analysis.

Course Outcome (CO):

On completion of the course, learner will be able to–

CO1: Demonstrate proficiency in creating, formatting, and managing documents in MS Word, ensuring clarity and professionalism.

CO2: Apply mail merge and table creation techniques in MS Word to enhance document organization and presentation.

CO3: Design and implement databases in MS Access, effectively using them as backends for applications to manage data efficiently.

CO4: Utilize Excel sheets proficiently by employing various formulas for calculations, data manipulation, and analysis, contributing to informed decision-making processes.

Office Automation Part-I	**Total Hrs: 15**
Unit-I	
Introduction to MS-Word : Create and save a document using MS WORD, Format the Text document, Spell check, format the document, print the document, mail merge, table creation in MS-word.	**05**
Unit-II	
Introduction to Access: how to create database, save database. Use database as backend for an application.	**05**
Unit-III	
Introduction to Excel: how to create excel sheet, Use various formulas for calculation	**05**

Text books :

1. "Microsoft Word 2019 Step by Step" by Joan Lambert and Curtis Frye
2. "Office Automation" by Dr.P.Rizwan Ahmed –Marghan Publication
3. "Microsoft Access 2019: The Complete Guide" by Adam Brown
4. "Excel 2019 Bible" by Michael Alexander and Richard Kusleika

Reference books:

1. "Professional Office Procedure" by Susan H Cooperman, Printice Hall
2. "Microsoft Word 2019 Inside Out" by Joe Habraken
3. "Microsoft Excel 2019 Step by Step" by Curtis Frye

Course No(N&M|SEC1|P120): Practical based on Office Automation Part-I

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M|SEC1|P120**	SEC1	Practical	1	2	30		----	----	----

Title of the Course No(N&M|SEC1|P120): Practical based on Office Automation Part-I

Learning Objective :

i. Develop proficiency in creating and formatting documents in MS Word, including spell checking, mail merge, and table creation.
ii. Gain practical skills in database creation and management using MS Access, including data input, query execution, and report generation.
iii. Acquire knowledge of Excel functions and formulas for data analysis and reporting, including pivot table creation and charting.
iv. Enhance understanding of software integration by using MS Access as a backend for an application and leveraging Excel for advanced data manipulation.

Course Outcome (CO):

After completion of course students will be able to:

CO1: Demonstrate competence in producing professional-quality documents in MS Word, incorporating formatting styles, mail merge functionality, and tables.

CO2: Utilize MS Access effectively for database management tasks, such as data input, query execution, report generation, and application integration.

CO3: Apply Excel functions and formulas proficiently to perform data analysis, generate meaningful insights, and present information visually using pivot tables and charts.

CO4: Develop the ability to integrate MS Office applications seamlessly for enhanced productivity and data-driven decision-making in various contexts.

Practical based on Office automation –Part 1	Total Hrs: 30
i. Create a new document in MS Word, format text (font, size, color, alignment), and save it in different file formats (e.g., .docx, .pdf). ii. Perform a spell check on the document, correct spelling errors, and apply formatting styles (e.g., headings, bullet points). iii. Create a mail merge document using a sample data source (e.g., Excel spreadsheet) for personalized letters or envelopes. iv. Design and format a table in MS Word, including adjusting column width, adding borders, and applying shading to cells. v. Create a new database in MS Access, define tables with appropriate fields and data types, and establish relationships between tables. vi. Input sample data into the tables, perform queries to retrieve specific information, and generate reports based on query results. vii. Use MS Access as a backend for a simple application (e.g., inventory management system) to demonstrate data integration and functionality. viii. Create a new Excel sheet, input data into cells, and use basic formulas (e.g., SUM, AVERAGE) for calculations. ix. Utilize advanced formulas (e.g., VLOOKUP, IF statements) to perform data analysis and generate meaningful insights from a dataset. **x.** Design a pivot table in Excel to summarize and analyze data, customize pivot table settings, and create pivot charts for visual representation.	

Course No(N&M\|SEC1\|T121): PC ASSEMBLING

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M| SEC1| - T121**	SEC1	Theory	1	2	15		----	----	----

Learning objectives :

i. Develop proficiency in assembling hardware components, including CPUs, motherboards, RAM, storage devices, and graphics cards.
ii. Gain knowledge of different types and specifications of computer hardware components and their compatibility.
iii. Understand interfaces and ports such as USB, HDMI, DisplayPort, Ethernet, and expansion slots like PCIe for connectivity.
iv. Learn to install operating systems, device drivers, application software, and computer peripherals effectively.

Course Outcome (CO):

On completion of the course, learner will be able to–

CO1: Demonstrate the ability to assemble and install hardware components, operating systems, and device drivers according to industry standards.

CO2: Identify and troubleshoot hardware and software issues, executing computer tests to diagnose and resolve problems.

CO3: Apply safety precautions and best practices when handling computer components and equipment to prevent damage.

CO4: Gain hands-on experience in PC assembly, maintenance, and troubleshooting, replacing faulty components as needed for optimal system performance.

PC ASSEMBLING	**Total Hrs: 15**
Unit-I	
Assemble Hardware Components and installing Operating system and device drivers. Different types and specifications of CPUs, motherboards, RAM modules, storage devices, and graphics cards. Introduction to interfaces and ports: USB, HDMI, DisplayPort, Ethernet, audio jacks, expansion slots (PCIe).	**05**
Unit-II	
Install application software and computer peripherals, how to install application software, Execute computer test and trouble shoot ,replace faulty components	**05**
Unit-III	
Safety precautions and best practices for handling computer components and static-sensitive equipment. Step-by-step guide to assembling a PC: installing the CPU, mounting the motherboard, inserting RAM modules, connecting storage drives, installing the graphics card, and connecting power cables.	**05**

Textbooks:

1. "Upgrading and Repairing PCs" by Scott Mueller
2. "Build Your Own PC Do-It-Yourself For Dummies" by Mark L. Chambers
3. "CompTIA A+ Certification All-in-One Exam Guide, Tenth Edition" by Mike Meyers
4. "The Complete Idiot's Guide to Computer Basics" by Joe Kraynak

Reference Books:

1. "PC Hardware in a Nutshell" by Robert Bruce Thompson and Barbara Fritchman Thompson
2. "The PC and Gadget Help Desk: A Do-It-Yourself Guide to Troubleshooting and Repairing" by Mark Edward Soper
3. "Computer Repair with Diagnostic Flowcharts: Troubleshooting PC Hardware Problems from Boot Failure to Poor Performance" by Morris Rosenthal
4. "A+ Guide to Managing & Maintaining Your PC" by Jean Andrews
5. "Computer Organization and Design: The Hardware/Software Interface" by David A. Patterson and John L. Hennessy
6. "Operating System Concepts" by Abraham Silberschatz, Greg Gagne, and Peter B. Galvin
7. "CompTIA A+ Certification Study Guide" by Quentin Docter, Emmett Dulaney, and Toby Skandier

Course No(N&M|SEC1|P121): Practical based on PC ASSEMBLING

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **N&M|SEC1|P121**	SEC1	Practical	1	2	30		----	----	----

Title of the Course No(N&M|SEC1|P121): Practical based on PC ASSEMBLING

Learning Objective :

i. Develop hands-on proficiency in assembling computer hardware components and installing an operating system.
ii. Gain practical experience in installing device drivers, application software, and configuring computer peripherals.
iii. Acquire troubleshooting skills to diagnose and replace faulty hardware components for optimal system performance.

iv. Learn and apply safety precautions and best practices when handling computer components and equipment.

Course Outcomes (CO):

After completion of course students will be able to:

CO1: Demonstrate competence in assembling and configuring computer systems, including hardware components, operating systems, and software applications.

CO2: Identify and resolve hardware and software issues using diagnostic tests and troubleshooting techniques.

CO3: Enhance problem-solving skills by replacing faulty hardware components and ensuring system functionality.

CO4: Implement safety protocols and best practices to prevent damage to computer components and ensure a safe working environment.

Practical based on PC ASSEMBLING	**Total Hrs: 30**
i. Assemble a computer system from scratch, including selecting compatible hardware components such as CPU, motherboard, RAM, storage devices, and graphics card. ii. Install the chosen hardware components into the appropriate slots on the motherboard, ensuring proper connections and cable management. iii. Install an operating system (e.g., Windows, Linux) on the newly assembled computer system, following the installation wizard and configuring basic settings. iv. Install device drivers for hardware components such as graphics card, sound card, network adapter, and peripherals (e.g., printer, scanner). v. Install application software (e.g., Microsoft Office suite, antivirus software) on the computer system, ensuring proper installation and activation. vi. Connect and configure computer peripherals such as monitors, keyboards, mice, printers, and external storage devices, testing functionality and compatibility. vii. Execute diagnostic tests using software tools (e.g., CPU-Z, GPU-Z) to check hardware performance and identify potential issues. viii. Troubleshoot and replace faulty hardware components (e.g., RAM modules, hard drive) using proper techniques and tools.	

ix. Demonstrate safety precautions when handling computer components and equipment, including wearing anti-static wrist straps and working in a static-free environment. x. Practice step-by-step PC assembly following manufacturer guidelines and industry standards, focusing on installing the CPU, mounting the motherboard, inserting RAM modules, connecting storage drives, installing the graphics card, and connecting power cables.	

<u>This course is available for other faculty only</u>

Course No.- Introduction to Google Workspace-Part1

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course **GE1**	GE1	Theory	2	2	30		----	----	----

Title of the Course (GE1): Introduction to Google Workspace-Part1

Learning objectives:

i. Gain the knowledge of creating documents.
ii. Understand how manage documents
iii. Get the knowledge and importance of sharing documents.
iv. Demonstrate use of Google doc, Google excel and Google presentation

Course Outcome (CO):

After completion of course, students will be able to:

CO 1 : Simplify basic office tasks and improve work productivity.

CO2: To be able to create documents for printing and sharing.

CO3: To be able to create and share presentations.

CO4: To be able to manage and store data in a spreadsheet.

	Total Hrs: 30
Unit-I	**10 hrs**
Google Doc: Create new documents from scratch, as well as from templates, Open existing documents from Google Docs, as well as other word processing programs, Navigate both the desktop and mobile versions of Google Docs, Format text, paragraphs, and pages, Insert, format, and edit images and graphics, Share and collaborate on documents with other users, Publish documents to the web, Print documents, Install add-ons to give Google Docs even more function and features.	
Unit-II	**10 hrs**
Google Sheet: Create a spreadsheet, Format cells, rows, columns, and entire worksheets so they fit and match your data, Enter data into a spreadsheet, Use formulas and functions for calculations, Create formulas and functions, Calculate data, Create charts for your data, Create forms, Create pivot tables and pivot charts, Work with templates.	
Unit-III Google Slide: Navigate the Google Slides interface, Create new presentations from scratch – or by using beautiful templates, Add text, pictures, videos, shapes, diagrams, and charts to your presentations, Format the objects that you add to your presentations, Design slides using themes, colors, and special effects, Animate objects on slides to bring them to life, Add slide transitions, Printing presentations – or publish them to the web, Share and collaborate on presentations.	**10 hrs**

Text books:

1. "Google Docs For Dummies" by Ryan Teeter and Karl Barksdale
2. "Google Docs: The Ultimate User Guide to Master Google Docs" by George Nakos
3. "Google Sheets For Dummies" by Greg Harvey
4. "Google Slides For Dummies" by Ryan Teeter and Karl Barksdale

Reference Books:

1. "Google Docs 101: A Beginner's Guide to Google Docs" by Tina Sieber
2. "Google Sheets: The Comprehensive User Guide to Master Google Sheets" by George Nakos
3. "Google Sheets Formulas and Functions: A Step-by-Step Guide" by Scott La Counte
4. "Google Slides: The Ultimate User Guide to Master Google Slides" by George Nakos
5. "Google Slides Design Guide: How to Create Beautiful Presentations" by Kasey Bell
6. "Mastering Google Slides: Tips, Tricks, and Techniques for Effective Presentations" by Greg McKenzie
7. "Google Sheets Formulas and Functions: A Step-by-Step Guide" by Alexander Webber

Class: B.Sc. First Year
Semester: II Semester
Subject: Networking and Multimedia

Course No (N&M|DSC4|T150):Advance Computer Networks

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| DSC4| T150	DSC4	Theory	2	2	30		----	----	----

Title of the Course (DSC-4): Advance Computer Networks

Learning Objectives:

i. Understand the fundamentals of switching, routing, and IP address management, including BGP, RIP, OSPF, and Ethernet speed considerations.
ii. Learn about the importance of packet classification, traffic policing, traffic shaping, and advanced network congestion control techniques.
iii. Explore data communication models such as Internet Multicasting, VPN, Differentiated and Integrated Services, SONET, ATM, and MPLS for efficient network operations.
iv. Gain knowledge of TCP/IP variants, Mobile IP, Mobile TCP, IP Security, bandwidth utilization techniques, and logical addressing in IPv4 and IPv6 networks.

Course Outcomes (CO):

After completion of course students will be able to:

CO 1 : -To understand the fundamentals of Advanced Computer Network concepts like high speed Ethernet , packet classification, Multimedia Networking etc.

CO2: Implement bandwidth utilization techniques, mobile networking solutions, and IP security measures to enhance network efficiency, reliability, and security

CO3: To understand the existing advance networking and will have overview of future networking concepts.

CO4: Apply packet classification methods, traffic management techniques, and congestion control protocols to ensure reliable and efficient data transmission.

Advance Computer Networks	**Total Hrs: 30**
Unit-I	**10 hrs**

Switching and Routing: Introduction, performance considerations, BGP, RIP, OSPF, speed Ethernet, IP address lookup. Packet Classification: Need for packet classification and methods for packet classification, Traffic Polishing, Traffic Shaping. Advanced Network Congestion Control.	
Unit-II	**10 hrs**
Overview of data communication model – Internet Multicasting, VPN, Differentiated and Integrated Services – SONET, ATM – MPLS -Next generation Internet architectures, Green Communication Networks. Study of various TCP/IP variants.	
Unit-III	**10hrs**
Mobile IP, Mobile TCP, IP Security. Techniques for Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum. Logical addressing –IPV4, IPV6.	

Textbooks:

1. "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross
2. "TCP/IP Illustrated, Volume 1: The Protocols" by W. Richard Stevens, Gary R. Wright, and Andrew S. Tanenbaum
3. "Computer Networks" by Andrew S. Tanenbaum and David J. Wetherall
4. "Routing TCP/IP, Volume I" by Jeff Doyle and Jennifer Carroll

Reference Books:

1. "Data Communications and Networking" by Behrouz A. Forouzan
2. "Network Warrior" by Gary A. Donahue
3. "CCNA Routing and Switching Official Cert Guide" by Wendell Odom
4. "High-Performance Browser Networking" by Ilya Grigorik
5. "Computer Networking Problems and Solutions: An Innovative Approach to Building Resilient, Modern Networks" by Russ White and Ethan Banks
6. "Internetworking with TCP/IP" by Douglas E. Comer and David L. Stevens
7. "Network Security Essentials: Applications and Standards" by William Stallings

Course No (N&M|DSC4|P150): Practical based on Advance Computer Networks

Course No.	Type of Course	Theory /	Credits	Instruction hour	Total No. of Lectures/Ho	Duration of Exam	Formative	Summative	Total Marks

		Practical		per week	urs / Semester		Assessment Marks	Assessment Marks	
N&M| DSC4| P150	DSC4	Practical	2	4	60		----	----	----

Title of the Course (DSC-4): Practical based on Advance Computer Networks

Learning Objectives:

i. Gain hands-on experience in configuring and managing LANs, VLANs, and network devices for efficient data transmission.
ii. Develop skills in implementing security measures, such as access control lists, firewalls, and port security, to protect network infrastructure.
iii. Learn to troubleshoot network issues using monitoring tools like Wireshark and SNMP, ensuring optimal network performance.
iv. Understand advanced networking concepts, including QoS, VPNs, IPv6, and network redundancy, for designing resilient and scalable networks.

Course Outcomes(CO):

After completion of course students will be able to:

CO1: Demonstrate proficiency in configuring and managing network infrastructure, including routers, switches, VLANs, and DHCP services.

CO2: Apply security measures, such as ACLs, firewalls, and port security, to protect network resources and prevent unauthorized access.

CO3: Analyze network performance using monitoring tools like Wireshark and SNMP, and troubleshoot network issues effectively.

CO4: Design and implement resilient and scalable networks, incorporating advanced concepts like QoS, VPNs, IPv6, and network redundancy for optimized performance and reliability.

Practical based on Advance Computer Networks	**Total Hrs: 60**
i. Setting up a basic LAN network with routers and switches. ii. Configuring VLANs and implementing inter-VLAN routing. iii. Configuring and securing wireless networks using WPA2 encryption. iv. Implementing network address translation (NAT) for Internet access. v. Setting up and configuring a DHCP server for dynamic IP address assignment. vi. Configuring access control lists (ACLs) on routers for traffic filtering.	

vii. Implementing Quality of Service (QoS) for prioritizing network traffic. viii. Setting up a virtual private network (VPN) for secure remote access. ix. Configuring and testing different routing protocols like OSPF and BGP. x. Implementing IPv6 addressing and transitioning from IPv4. xi. Configuring port security on switches to prevent unauthorized access. xii. Setting up and testing network redundancy using Spanning Tree Protocol (STP). xiii. Implementing and testing firewall rules for network security. xiv. Configuring and monitoring network performance using SNMP. **xv.** Setting up and testing link aggregation (EtherChannel) for increased bandwidth.	

Course No(N&M|DSC5|T151):Design of Multimedia System

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| DSC5| T151	DSC5	Theory	2	2	30		----	----	----

Title of the Course (DSC-5): Design of Multimedia System

Learning Objectives:

i. Understand the fundamentals of image representation, colour science, and image compression techniques for multimedia applications.
ii. Develop skills in using multimedia tools, authoring software, and presentation tools for creating interactive multimedia content.
iii. Learn about multimedia hardware, storage devices, communication technologies, and their applications in business and work environments.
iv. Gain hands-on experience with video production equipment, editing tools, and accessories for capturing, editing, and enhancing multimedia content.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : To learn the basics and Fundamentals of Multimedia systems.

CO 2: To learn Multimedia components and Tools

CO 3: Learn the phases involved in multimedia planning, design and production

CO4 : Demonstrate proficiency in image processing, colour manipulation, and file format selection for optimized multimedia content creation.

Design of Multimedia System	**Total Hrs: 30**
Unit-I	**10 hrs**
Image fundamentals and representations: Colour Science , Colour, Colour Models, Colour palettes, Dithering, 2D Graphics, Image Compression and File Formats :GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS, PDF, Basic Image Processing [Can Use Photoshop]	
Unit-II	**10 hrs**
Multimedia, Multimedia Objects, Multimedia in business and work, Multimedia hardware, Memory and Storage devices, Communication devices. Presentation tools, object generation which includes video sound; image capturing, Authoring tools, card and page based authoring tools.	
Unit-III	**10hrs**
Video: different types of video camera including Handy Camera, Tape Formats, Analog Editing, Editing Equipment's and Consoles, Video Signal, Video Format, Video Lights - Types and Functions. Uses of Tripod- Types. Clapboard- Usage. Light meter. Other Useful Accessories.	

Textbooks:

1. "Introduction to Multimedia Systems" by Sugata Mitra
2. "Multimedia: Making It Work" by Tay Vaughan
3. "Digital Multimedia" by Nigel Chapman and Jenny Chapman
4. "Video Production Handbook" by Gerald Millerson and Jim Owens

Reference Books:

1. "The Art of Digital Video" by John Watkinson

2. "Color Correction Handbook: Professional Techniques for Video and Cinema" by Alexis Van Hurkman
3. "Understanding Digital Cinema: A Professional Handbook" by Charles S. Swartz
4. "Digital Video and HD: Algorithms and Interfaces" by Charles Poynton
5. "The Filmmaker's Handbook: A Comprehensive Guide for the Digital Age" by Steven Ascher and Edward Pincus
6. "Multimedia Systems and Applications" edited by Ralf Steinmetz and Klara Nahrstedt
7. "Multimedia Computing" by Ranjan Parekh and Sunita Roy

Course No (N&M|DSC4|P151): Practical based on Design of Multimedia System

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| DSC4| P151	DSC5	Practical	2	4	60		----	----	----

Title of the Course (DSC-5): Practical based on Design of Multimedia System

Learning Objectives:

i. Develop proficiency in using multimedia software tools for image editing, audio processing, video editing, and animation creation.
ii. Gain hands-on experience in colour correction, green screen compositing, 3D modelling, and virtual reality (VR) content creation.
iii. Learn to use video production equipment, recording techniques, and live streaming tools for professional video production.
iv. Develop skills in designing multimedia presentations, graphics for print and digital media, and interactive multimedia content.

Course Outcomes (CO):

After completion of course students will be able to:

CO 1 : Demonstrate proficiency in multimedia software applications for image editing, audio processing, video editing, and animation creation.

CO 2 : Apply colour correction techniques, green screen compositing, 3D modelling, and VR content creation skills in multimedia projects.

CO3 : Utilize video production equipment, recording techniques, and live streaming tools effectively for professional video production.

CO 4 : Create multimedia presentations, graphics for print and digital media, and interactive multimedia content for various purposes.

Practical based on Design of Multimedia System	Total Hrs: 60
i. Image editing and manipulation using software like Photoshop or GIMP. ii. Color correction and grading techniques for videos. iii. Creating and editing audio files using software like Audacity or Adobe Audition. iv. Designing multimedia presentations using tools like Microsoft PowerPoint or Prezi. v. Creating animations and motion graphics using software like Adobe After Effects. vi. Video editing and post-production using software like Adobe Premiere Pro or Final Cut Pro. vii. Green screen (chroma key) compositing for video effects. viii. Creating and editing 3D models and animations using software like Blender or Autodesk Maya. ix. Creating and editing vector graphics using software like Adobe Illustrator or Corel DRAW. x. Recording and editing voiceovers and sound effects for videos. xi. Encoding and compressing videos for different formats and resolutions. xii. Creating interactive multimedia content for websites or presentations. xiii. Designing and editing graphics for social media and digital marketing. xiv. Creating and editing subtitles and captions for videos. **xv.** Using video production equipment like cameras, lighting setups, and tripods for professional video shoots.	

Course No(N&M\|DSC6\|T152): Database Management System

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| DSC6| T152	DSC6	Theory	2	2	30		----	----	----

Title of the Course (DSC-6): Database Management System

Learning Objectives:

i. Understand the fundamentals of database systems, including the purpose, view of data, relational databases, and database architecture.
ii. Learn about transaction management, data abstraction, data models (ER Model, Relational Model), and database languages (DDL, DML) for efficient data handling.
iii. Develop skills in query processing, database design using ER diagrams, relational algebra, relational calculus, and SQL query language operations.
iv. Gain knowledge of advanced database concepts such as set operations, aggregate functions, views, triggers, and database design principles.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : - Demonstrate proficiency in designing and implementing database systems, including relational databases, data models, and database languages.

CO2: Apply transaction management techniques, data abstraction, and database design principles to create efficient and scalable database solutions.

CO3: Develop expertise in query processing, relational algebra operations, relational calculus, and SQL query language for data retrieval and manipulation.

CO4: Design and implement views, triggers, and advanced SQL queries to manage complex database operations and ensure data integrity.

Database Management System	**Total Hrs: 30**
Unit-I	**10 hrs**
Introduction to Databases and Transactions What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management, Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models Database Languages – DDL – DML – database, Access for applications Programs – data base Users and Administrator – Transaction Management – data base Architecture – Storage Manager.	
Unit-II	**10 hrs**
the Query Processor Data base design and ER diagrams – ER Model - Entities, Attributes and Entity sets – Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design .Query Languages, Relational Operations. Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus.	

Unit-III	10 hrs
Overview of the SQL Query Language – Basic Structure of SQL Queries, Set Operations, Aggregate Functions – GROUPBY – HAVING, and Nested Sub queries, Views, Triggers.	

Textbooks:

1. "Database Management Systems" by Raghu Ramakrishnan and Johannes Gehrke
2. "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan
3. "Fundamentals of Database Systems" by Ramez Elmasri and Shamkant B. Navathe
4. "Introduction to Database Systems" by C.J. Date

Reference Books:

1. "SQL Queries for Mere Mortals" by John L. Viescas and Michael J. Hernandez
2. "Database Design for Mere Mortals" by Michael J. Hernandez
3. "Database Design and Implementation" by Edward Sciore
4. "Database Systems: The Complete Book" by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom
5. "SQL in 10 Minutes, Sams Teach Yourself" by Ben Forta
6. "Database Design for Smarties: Using UML for Data Modeling" by Robert J. Muller
7. "Transactions and Database Dynamics" by Andreas Reuter and Theo Härder

Course No(N&M|DSC6|P152): Practical based on Database Management System

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| DSC4| P152	DSC6	Practical	2	4	60		----	----	----

Title of the Course (DSC-6): Practical based on Database Management System

Learning Objectives:

i. Develop proficiency in SQL commands for database creation, manipulation, querying, and optimization.
ii. Gain hands-on experience in designing and implementing database schemas, ER diagrams, and normalization techniques.
iii. Learn transaction management concepts and techniques for ensuring data consistency and integrity.
iv. Acquire skills in database administration tasks such as backup, recovery, access control, and performance tuning.

Course Outcomes (CO):

After completion of course students will be able to:

CO 1 : Demonstrate proficiency in using SQL commands for database management, data retrieval, and manipulation tasks.

CO 2 : Design and implement normalized database schemas, ER diagrams, and database constraints for data integrity.

CO 3 : Apply transaction management techniques to ensure ACID properties (Atomicity, Consistency, Isolation, Durability) in database operations.

CO 4: Perform database administration tasks including backup, recovery, access control, and performance optimization to maintain efficient and reliable database systems.

Practical based on Database Management System	**Total Hrs: 60**
i. Creating and managing databases, tables, and relationships using SQL commands (DDL) for data definition. ii. Inserting, updating, and deleting data records using SQL commands (DML) for data manipulation. iii. Designing and implementing ER diagrams for conceptual database modelling. iv. Normalizing database tables to minimize redundancy and improve data integrity. v. Implementing primary keys, foreign keys, and constraints for data integrity enforcement. vi. Creating and executing SQL queries for data retrieval using SELECT statements. vii. Implementing set operations (UNION, INTERSECT, EXCEPT) and aggregate functions (COUNT, SUM, AVG, etc.) in SQL queries. viii. Designing and creating views for virtual data representation.	

ix. Implementing triggers for automated database actions based on events. x. Creating stored procedures and functions for reusable database logic. xi. Implementing transactions using SQL commands (BEGIN TRANSACTION, COMMIT, ROLLBACK) for data consistency. xii. Optimizing SQL queries and database performance using indexing techniques. xiii. Backing up and restoring databases for data protection and recovery. xiv. Implementing user roles and permissions for database access control. **xv.** Generating and executing nested subqueries for complex data retrieval.	

Course No (N&M|VSC1|T164): Programming using C++ -Part-I

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| VSC1|T 164	VSC1	Theory	1	1	15		----	----	----

Title of the Course (VSC1): Programming using C++ -PartI

Learning Objectives:

i. Understand the character set, symbols, keywords, and identifiers in C++ programming.
ii. Learn about variables, constants, reference variables, and dynamic initialization techniques in C++.
iii. Familiarize with basic data types, streams, operators, manipulators, and control structures in C++.
iv. Gain knowledge of object-oriented programming (OOP) concepts, including abstraction, encapsulation, inheritance, and polymorphism.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : Demonstrate proficiency in using tokens, identifiers, variables, constants, and reference variables in C++ programs.

CO 2 : Apply dynamic initialization techniques, basic data types, streams, and operators effectively in C++ programming.

CO 3 : Implement decision and control structures such as if statements and loops statements for program control.

CO 4 : Understand the principles of object-oriented programming (OOP) and apply concepts like abstraction, encapsulation, inheritance, and polymorphism in C++ program design.

Programming using C++ -Part I	**Total Hrs: 15**
Unit-I	**05 hrs**
Elements of C++ Language Tokens and identifiers: Character set and symbols, Keywords, C++ identifiers; Variables and Constants: Integer, character and symbolic constants; Dynamic initialization of variables, Reference variables, Basic data types in C++, Streams in C++	
Unit-II	**05 hrs**
Operators and Manipulators Operators, Types of operators in C++, Precedence and associativity of operators, Manipulators. Decision and Control Structures :if statement, if-else statement, switch statement, Loop: while, do-while, for; Jump statements:break, continue, go to.	
Unit -III	**05 hrs**
Introduction to Object Oriented Programming, Basic concept of OOP, Comparison of Procedural Programming and OOP, Benefits of OOP, C++ compilation, Abstraction, Encapsulation, Inheritance, Polymorphism.	

Textbooks:

1. "C++ Primer" by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo
2. "Programming Principles and Practice Using C++" by Bjarne Stroustrup
3. "Effective C++: 55 Specific Ways to Improve Your Programs and Designs" by Scott Meyers
4. "The C++ Programming Language" by Bjarne Stroustrup

Reference Books:

1. "C++ FAQs" by Marshall Cline, Greg Lomow, and Mike Girou
2. "C++ Templates: The Complete Guide" by David Vandevoorde and Nicolai M. Josuttis
3. "C++ Standard Library: A Tutorial and Reference" by Nicolai M. Josuttis

4. "Accelerated C++: Practical Programming by Example" by Andrew Koenig and Barbara E. Moo
5. "C++ Concurrency in Action" by Anthony Williams
6. "Modern C++ Programming with Test-Driven Development" by Jeff Langr
7. "Advanced C++ Metaprogramming" by Davide Di Gennaro

Course No (N&M|VSC1|P164): Practical based on Programming using C++ -Part-I

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| VSC1| P164	VSC1	Practical	1	2	30		----	----	----

Title of the Course (VSC1): Practical based on Programming using C++ -Part-I

Learning Objectives:

i. Develop proficiency in using variables, constants, reference variables, and dynamic memory allocation in C++ programs.
ii. Gain hands-on experience with basic data types, operators, manipulators, control structures, and object-oriented programming (OOP) concepts in C++.
iii. Understand the principles of encapsulation, inheritance, polymorphism, and dynamic memory management in C++ programming.
iv. Learn to design, implement, and debug C++ programs to solve real-world problems and tasks.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : Demonstrate proficiency in writing, compiling, and executing C++ programs using variables, constants, and reference variables.

CO 2 : Apply operators, manipulators, control structures, and OOP principles to design and implement efficient C++ programs.

CO 3: Implement encapsulation, inheritance, and polymorphism in object-oriented C++ programming for code reusability and modularity.

CO4 : Analyze and debug C++ programs to identify and resolve logical and syntactical errors, ensuring program correctness and reliability.

Practical based on Programming using C++ -Part-I	**Total Hrs: 30**

i. Setting up a development environment for C++ programming (IDE, compiler, debugger). ii. Writing and executing a simple C++ program to display "Hello, World!". iii. Using variables to store and manipulate integer, character, and symbolic constants. iv. Implementing dynamic initialization of variables based on user input. v. Declaring and using reference variables to manipulate data. vi. Working with basic data types such as int, char, float, double, etc. vii. Using streams (iostream library) for input and output operations in C++. viii. Implementing arithmetic, relational, logical, and bitwise operators in C++. ix. Understanding the precedence and associativity of operators in C++ expressions. x. Using manipulators (e.g., setw, setprecision) for formatting output. xi. Implementing decision-making structures like if statements and switch-case statements. xii. Using loops such as while, do-while, and for loops for repetitive tasks. xiii. Employing statements like break, continue, and goto for control flow. **xiv.** Using member functions and constructors in C++ classes. xv. Creating and managing arrays and pointers in C++ programs.	

Course No (N&M|VSC1|T165): Programming using Java –Part-I

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| VSC1|T 165	VSC1	Theory	1	1	15		----	----	----

Title of the Course (VSC1): Programming using Java –Part-I

Learning Objectives:

i. Understand the history, features, and structure of Java programming language.
ii. Develop proficiency in writing and executing basic Java programs using operators, control structures, arrays, and strings.

iii. Learn object-oriented programming (OOP) concepts such as classes, objects, methods, constructors, inheritance, interfaces, and packages in Java.
iv. Gain knowledge of advanced Java concepts including exception handling, multithreading, and inner classes.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : Demonstrate proficiency in writing Java programs to solve simple to complex problems using operators, control structures, arrays, and strings.

CO 2 : Apply object-oriented programming principles to design and implement Java classes, objects, methods, constructors, and relationships between objects.

CO 3: Handle exceptions effectively using exception handling mechanisms in Java to ensure program reliability and robustness.

CO 4 : Implement multithreading concepts to create concurrent Java programs for efficient task management..

Programming using Java -Part1	**Total Hrs: 15**
Unit-I	
History of JAVA, Java Features, Structure of JAVA, Basic Programs Operators & Types, If, if else, nested if, else if ,switch While, do-while, for Break, continue, Arrays, Strings,	**05 hrs**
Unit-II	**05 hrs**
Class and Object Declaration Methods, Constructors: What is Constructor? Type of Constructor, Constructor Overloading This keyword Relationship Between Objects: By Using Reference Inner Class Concept, Interfaces, Packages, Exception Handling, Multithreading	
Unit-III	**05 hrs**
Introduction to OOPS, Basic concept of OOP Encapsulation, Polymorphism , Abstraction, Inheritance, Types of Methods Passing Object as Method, Argument	

Textbooks:

1. "Java: A Beginner's Guide" by Herbert Schildt
2. "Head First Java" by Kathy Sierra and Bert Bates

3. "Effective Java" by Joshua Bloch
4. "Java Programming for Beginners" by Mark Lassoff

Reference Books:

1. "Java: The Complete Reference" by Herbert Schildt
2. "Core Java Volume I--Fundamentals" by Cay S. Horstmann and Gary Cornell
3. "Java Concurrency in Practice" by Brian Goetz et al.
4. "Java: The Good Parts" by Jim Waldo
5. "Thinking in Java" by Bruce Eckel
6. "Java Design Patterns" by James William Cooper
7. "Java Cookbook" by Ian F. Darwin

Course No (N&M|VSC1|P165): Practical based on Programming using Java -Part-I

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
N&M| VSC1| P165	VSC1	Practical	1	2	30		----	----	----

Title of the Course (VSC1): Practical based on Programming using Java -Part-I

Learning Objectives:

i. Understand Java syntax, data types, control structures, and object-oriented programming (OOP) concepts through practical implementation.
ii. Develop proficiency in writing and executing Java programs to solve real-world problems using arrays, strings, classes, objects, and methods.
iii. Learn to handle exceptions, implement multithreading, and design concurrent Java programs for efficient task management.
iv. Apply advanced Java concepts such as inheritance, polymorphism, encapsulation, and abstraction in program design and development.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : Become proficient in Java programming, including syntax, control structures, arrays, strings, classes, objects, and methods.

CO2 : Learn to handle exceptions and implement multithreading

CO 3 : Adopt effective programming practices such as commenting, documentation, optimization, and version control for quality code.

CO 4 : Grasp advanced Java concepts such as interfaces, constructors, and method overloading

Practical based on Programming using Java -Part-I	**Total Hrs: 30**

i. Setting up Java development environment (JDK, IDE like Eclipse or IntelliJ IDEA). ii. Writing and executing a simple Java program to display "Hello, World!". iii. Implementing basic programs to understand Java operators and types (int, float, char, boolean, etc.). iv. Using if, if-else, nested if, else-if, and switch-case statements for decision making. v. Implementing while, do-while, and for loops for iterative tasks in Java. vi. Using break and continue statements for loop control in Java programs. vii. Creating and manipulating arrays (single-dimensional and multi-dimensional) in Java. viii. Working with strings, including string concatenation, substring, and string methods. ix. Declaring and using classes and objects in Java programs. x. Implementing methods (functions) with different return types and parameters in Java. xi. Understanding constructors in Java, including default, parameterized, and constructor overloading. xii. Using the 'this' keyword to refer to current object instances in Java. xiii. Exploring the relationship between objects by passing objects as method arguments. xiv. Implementing inner classes (nested classes) in Java programs. xv. Handling exceptions using try-catch blocks and throwing custom exceptions in Java.	

Only available for other faculty

Course No : Google workspace –part –II

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
GE2	GE2	Theory	2	2	30		----	----	----

Course Title of the Course (GE/OE-2): Google workspace –part –II

Learning Objectives:

i. Develop proficiency in setting up and customizing Gmail accounts, organizing emails, managing contacts, and scheduling emails efficiently.
ii. Learn cloud-based file management techniques using Google Drive, including uploading, sharing, collaborating, and managing file versions.
iii. Gain skills in organizing and analyzing data using Google Sheets, including mathematical operations, sorting, filtering, pivot tables, and charts.
iv. Understand the features and functionalities of Google Forms for creating surveys, quizzes, collecting data, and linking form responses to Google Sheets.

Course Outcome (CO):

After completion of course students will be able to:

CO 1 : Demonstrate efficient email management skills, including account setup, customization, inbox organization, labeling, filtering, and scheduling emails.

CO 2 : Apply cloud-based file management techniques in Google Drive for uploading, sharing, collaborating, and managing file versions with different permission levels.

CO3 : Analyze and interpret data using Google Sheets, including mathematical operations, sorting, filtering, pivot tables, and charts for data visualization.

CO 4 : Create surveys, quizzes, and forms using Google Forms, analyze form responses, link forms to Google Sheets, and utilize extensions and add-ons for enhanced functionality.

Google workspace –part –II	**Total Hrs: 30**

Unit-I	10 hrs
Efficient Email Management with Gmail: Setting up a Google account, Gmail account setup and customization, Creating, formatting, and attaching files to emails Inbox organization, archiving, and marking emails, Labels, filters, and folder management, Managing contacts and tasks in Gmail, Scheduling Emails	
Unit-II :	
Cloud-based file management: Google Drive ,Overview of the Google Drive interface ,Uploading and downloading files and folders ,Sharing files with individuals or groups, setting different permission levels, collaboration , Managing file versions and revisions Data collection, organize and analyzing: Google Sheet and Google Form	**10 hrs**
Unit-III :	**10 hrs**
Organizing and Formatting Data in Google Sheet :mathematical operations, analyzing data using,sorting, filtering, and pivot tables, charts and graphs, Designing and creating surveys with Google Forms,question formats, Quizzes, sections, reviewing andanalyzing form responses , Linking Google Forms to Google Sheets , Extensions and Add-ons Google Classroom :Creating and managing classes in Google Classroom, Assignments, Grading, Feedback, conducting exams, quizzes, sharing materials, Overview of other Google workspace productivity tools: Google Calendar, Google Keep, Google Meet etc.	

Textbooks:

1. "Gmail For Dummies" by Mark S. Chambers
2. "Google Drive and Docs In 30 Minutes" by Ian Lamont
3. "Google Sheets: A Beginner's Guide" by Scott La Counte
4. "Google Forms Guide: Everything You Need to Know" by Jean Kelsey

Reference Books:

1. "Google Workspace for Dummies" by Karl Barksdale and David Masters
2. "Google Classroom: The Ultimate Guide" by Kimberly Harrison
3. "Google Calendar Quick Reference Guide" by Beezix Inc.
4. "Google Meet Guide: Everything You Need to Know" by Mary Ann Richardson
5. "Google Keep: The Comprehensive Guide" by Matt McCarthy
6. "Google Workspace Collaboration for Dummies" by Heather E. Hudson
7. "Google Productivity Tools for Business" by Bradley Metrock