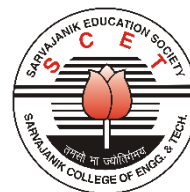




SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



B. Tech. Semester VI

Subject Name: Multimedia Communication

Subject Code: BTEC14618

Type of course: PEC

Prerequisite: Computer Networking

Rationale: This subject provides a practical introduction to various audio and video formats, combining different media on a web application and transmission of audio and video signalling over an underlying network using various protocols.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	2	4	60	25	15	30	20	150

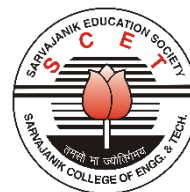
CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests) **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. no.	Topics	Teaching Hrs.	Module % Weightage
1.	Introduction To Multimedia: Multimedia Signal, Elements of Multimedia Communication Systems, Challenges Involved with Multimedia Communication, Types of Multimedia (Image, Text, Audio, Video).	3	5
2.	Real time protocol: Introduction to RTP, Brief History of Audio/Video Networking, Related Standards, Overview of an RTP Implementation.	3	5
3.	Voice and Video Communication Over Packet Networks: Performance Characteristics of an IP Network, Measuring IP Network Performance, Effects of Transport Protocols, Requirements for Audio/Video Transport in Packet Networks.	5	15
4.	Real-Time Transport Protocol: Fundamental Design Philosophies of RTP, Standard Elements of RTP, Related Standards, RTP Data Transfer Protocol, RTP Sessions, RTP Data Transfer Packet, Packet Validation, Translators and Mixers, RTP Control Protocol, Components of RTCP, Transport of RTCP Packets, RTCP Packet Formats, Security and Privacy, Packet Validation, Participant Database, Timing Rules.	8	20
5.	Media capture and Synchronization:	8	20



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



	Behavior of a Sender, Media Capture and Compression, Generating RTP Packets, Behavior of a Receiver, Packet Reception, The Playout Buffer, Adapting the Playout Point, Decoding, Mixing, and Playout, Lip Synchronization, Sender and receiver Behavior, Synchronization Accuracy.		
6.	Error Concealment: Techniques for Audio Loss Concealment, Techniques for Video Loss Concealment, Forward Error Correction, Channel Coding, Retransmission.	5	10
7.	Congestion Control: Delay Loss and Throughput in Packet-Switched Networks, Principles of Congestion Control, The Need for Congestion Control, Approaches to Congestion Control on the Internet, Implications for Multimedia, Congestion Control for Multimedia, TCP Congestion Control, Fairness.	7	15
8.	Multimedia Application: IP Multicast, Streaming Video, Voice Over IP, SIP, Multimedia QoS, Resource reservation protocol RSVP, Real time streaming protocol	6	10

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	15	20	20	15	20

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels (**Revised Bloom’s Taxonomy**)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	RTP: Audio and Video for the Internet	Colin Perkins	Addison Wesley	2003	Latest
2.	Multimedia Communications: Application, Network, Protocols and Standards	Fred Halsall	Pearson Education Asia	2003	Latest
3.	Multimedia: Computing Communications amp Applications	Ralf Steinmetz	Pearson Education Asia	2002	Latest



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



Course Outcome:

Sr. No.	CO Statement After learning this subject students will be able to,	Marks % weightage
CO-1	Describe technical characteristics and performance of multimedia systems.	10
CO-2	Explain real time protocol and its implementation.	20
CO-3	Analyze performance characteristics of an IP Network for voice and video communication.	20
CO-4	Describe error concealment techniques for error correction.	10
CO-5	List reasons for congestion in the network and explain congestion control approaches.	20
CO-6	Explain real time voice and video streaming.	20

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	3	2	-	2	-	2	2	-	2	2	2	2	2	-	2
CO-2	3	3	3	2	2	2	-	-	3	3	3	3	-	2	-
CO-3	3	2	2	2	2	2	2	-	2	2	3	2	2	2	3
CO-4	3	2	-	2	-	-	-	-	2	2	2	2	2	-	2
CO-5	3	2	-	2	-	-	-	-	2	2	2	2	-	-	2
CO-6	3	2	-	2	-	2	-	-	2	2	2	2	-	-	-

List of Practical:

1. Capture network traffic and analyse multimedia packets.
2. Demonstrate conversion from any source video format to another format like MP4/3GP/AVI/FLV/GIF/MOV/SWF/MPG.
3. Demonstrate conversion from any source audio format to MP3/MPZ/WAV/FLAC/WMA etc using format.
4. Demonstrate conversion from any source picture format to JPG/PNG/BMP/GIF/TIF/ PCX/ TGA
5. Demonstrate the transmission of audio file (MP3/MPZ/WAV/FLAC/WMA) on IP based wired/wireless network.
6. Demonstrate the transmission of video file (MP4/3GP/AVI/FLV/GIF/MOV/SWF/MPG) on IP based wired/wireless networks.
7. Measure network performance using NS2.
8. Simulate Wi-Fi using Network Simulator 3.
9. Demonstrate congestion control scenario using Network Simulator.
10. Implement file transfer protocol using TCP socket programming.