LJ University
University with a Difference

Diploma in Electronics & Communication Engineering

Course Code: 25030602

Satellite & Multimedia Communication

Programme / Branch Name			Diploma in Electronics and Communication Engineering			
Course Name	Satellite & Multimedia Communication				**Course Code**	025030602
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week				Evaluation Scheme							
				Theory Marks				Practical Marks			Total Marks
L	**T**	**P**	**Total Credit**	**ESE**	**CA**	**PA**	**Total**	**PV**	**TW**	**Total**	
4	0	2	5	50	10	40	100	30	20	50	150

Legends: ESE: End Semester Exam CA: Continuous Assessment (Attendance + Activity)
PA: Progressive Assessment PV: Practical Viva
TW: Term Work

2. Prerequisite

The course content should be taught and implemented with the aim to develop required skills in the students so that they are able to acquire following competency:

- ✓ Operate and maintain multimedia communication systems in the communication chain

3. Rationale

Multimedia communications have brought the paradigm shift in electronic communication system. The most common day to day gadgets and applications which use multimedia are telephone, television, wireless systems, internet and video call and video conferencing, satellite television, remote file transfer etc. The objective of this course is to introduce the topics like multimedia file formats, multimedia network standards, satellite communication and telecommunication switching systems, which are used for communication everywhere. This course will help the students to develop the skills to operate and maintain the multimedia communication system and will also strengthen the job opportunities of electronics and communication engineering students

4. Objectives

- ✓ Explain telecommunication network architecture and performance of telecommunication switching system
- ✓ Describe components satellite communication system
- ✓ Identify requirements and of ISDN
- ✓ Identify different standards for multimedia communication.
- ✓ Choose required networks standards and file formats for multimedia communication.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcomes	% Weightage	Hours
1	**Basics of Switching Systems and Telephone Networks**	1.1. Switching Systems Evolution of telecommunications, Elements of switching system 1.2. Switching network Configurations, signaling tones and DTMF signaling 1.3. Stored program control Centralized, Distributed 1.4. Two stage networks and its comparison with single stage network 1.5. Switching Hierarchy and routing 1.6. Signaling techniques and their comparison 1.7. Network traffic load and parameters 1.8. Grade of service and blocking probability	• Describe basics functions of a Switching systems. • List the signaling tones used for the telephony • Explain stored program control switching system • Compare two stage and single stage network • Switching network • Compare signaling techniques. • Calculate network traffic. • Evaluate quality of switching system • Define Grade of service and blocking probability	20%	10
2	**Satellite Communication**	2.1. Introduction to satellite communication: Kepler's three laws of satellite motion in Orbits 2.2. Satellite Orbits: LEO, MEO and GEO 2.3. Basics of space craft: Power systems, Attitude and orbit control system, Telemetry tracking and Command 2.4. Earth station and receivers	• State Kepler's Laws of satellite motion orbital motion of satellite. • Compare LEO, MEO and GEO • Block diagram of satellite systems • Describe working of satellite antennas. • Draw the block diagram of satellite earth stations • Discuss working of DTH receiver	20%	12
3	**Integrated Services Digital Networks (ISDN)**	3.1. ISDN concepts, standards, protocol architecture 3.2. Transmission channels, Signaling 3.3. ISDN services 3.4. Broadband ISDN	• Concept of ISDN • Describe architecture of ISDN • Write ISDN standards and signaling • Explain need for broadband ISDN	20%	12

			• List ISDN services • Discus need for broadband ISDN		
4	**Multimedia Communication Techniques and Standards**	4.1. Multimedia Communications: Model, Elements of Multimedia Systems, User and, Network requirements 4.2. Multimedia processing for communication: digital media, signal processing elements, digital audio file formats, digital image file formats, digital video file formats 4.3. Distributed Multimedia Systems 4.4. Multimedia communication standards	• Describe challenges of multimedia communication. • Explain needs of multimedia processing. • Identify applications of DMS. • List multimedia standards for audio, video and image • Describe ITV and VOD services • Summarized ITU-T standardization	20%	12
5	**Multimedia Communications Across Networks**	5.1. Multimedia across IP Networks 5.2. Multimedia across DSLs, VODSL architecture 5.3. Multimedia Across Wireless 5.4. Speech transmission in GSM 5.5. Digital video broadcasting	• Explain the use of IP networks for multimedia communication. • Describe use of DSL for multimedia communication. • Compare DSL and ADSL for multimedia communication • List use of wireless network for multimedia communication. • Summarize multimedia broad band broadcasting services	20%	12
			Total Hours		56

6. List of Practical / Exercises

The practical/exercises should be properly designed and implemented in an attempt to develop different types of skills that students can acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Sr. No	Practical / Exercises	Key Competency	Hours
1	Demonstrate the complete call procedure using Telephone trainer	Telephone Network	2
2	Estimate network traffic using MATLAB	Telephone Network	2
3	Calculate the blocking probability of any network using MATLAB.	MATLAB	2
4	Develop a code to analyze of link Budget Equation using MATLAB	MATLAB	2
5	Develop a code to convert the from any source video format to mobile compatible form MP4/3GP/AVI/FLV/GIF/MOV/SWF/MPG	MATLAB	2
6	Develop a code to convert from any source audio format to MP3/MPZ/WAV/FLAC/WMA etc Using format factory	MATLAB	2
7	Develop a code to convert from any source picture format to JPG/PNG/BMP/GIF/TIF/ PCX/ TGA etc	MATLAB	2
8	Develop a code to convert from music CD to audio file using format factory	MATLAB	2
9	Develop a code to get information about a graphic file using imread( )function of MATLAB	MATLAB	2
10	Develop a code to write image matrix in to a file using imwrite( )function of MATLAB	MATLAB	2
11	Develop a code to enhance an image by intensity adjustment using imadjust ( ) function of MATLAB.	MATLAB	2
12	Develop a code to add noise in an image using filter2 ( ) function of MATLAB.	MATLAB	2

7. Suggested Specification of Bloom's Taxonomy

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1	Basics of Switching Systems and Telephone Networks	40	30	20			10
2	Satellite Communication	30	30	30		10	
3	Integrated Services Digital Networks (ISDN)	30	20	30	20		
4	Multimedia Communication Techniques and Standards	30	30	20		10	10
5	Multimedia Communications Across Networks	30	30	20		10	10

Legends: R-Remembering C- Creating
U- Understanding E- Evaluating
App- Applying An- Analyzing

8. Textbook

1) Telecommunication Switching Systems and Networks by Viswanathan, Thiagarajan, PHI
2) Multimedia Communication systems by Rao, Pearson Education

9) Reference Books

1) Electronic Communications by Roddy, Dennis, Pearson Education
2) Multimedia communication system by Fred Halsall, Pearson education

10) Open Sources (Website, Video, Movie)

1) www.matlab.com
2) www.scilab.com