

Semester: V		
TELECOMMUNICATION SYSTEMS		
Course Code:16G5B11		CIE Marks: 100
Credits: L:T:P:S:4:0:0:0		SEE Marks: 100
Hours:40		SEE Duration(Theory): 3 Hrs
Course Learning Objectives: The students will be able to		
1	Represent schematic of communication system and identify its components	
2	Classify satellite orbits and sub-systems for communication.	
3	Analyze different telecommunication services, systems and principles	
4	Explain the role of optical communication system and its components	
5	Describe the features of wireless technologies and standards.	
UNIT-I		
Introduction to Electronic Communication: The Significance of Human Communication, Communication Systems, Types of Electronic Communication, Modulation and Multiplexing, Electromagnetic Spectrum, Bandwidth, A Survey of Communication Applications. The Fundamentals of Electronics: Gain, Attenuation, and Decibels. Radio Receivers: TRF, Super heterodyne receiver, Frequency conversions, Intermediate and Image Frequency.		08 Hrs
UNIT-II		
Modulation Schemes: Analog Modulation: AM, FM and PM- brief review. Digital Modulation: PCM, Line Codes, ASK, FSK, PSK, and QAM. Wideband Modulation: Spread spectrum, FHSS, DSSS. Telephone and Cable Modems. Multiplexing and Multiple Access Techniques: Frequency division multiplexing, Time division multiplexing Multiple Access: FDMA, TDMA, CDMA, Duplexing.		08 Hrs
UNIT-III		
Satellite Communication: Satellite Orbits, Satellite Communication Systems, Satellite Subsystems, Ground Stations, Satellite Applications, Global Positioning System.		08 Hrs
UNIT-IV		
Optical Communication: Optical Principles, Optical Communication Systems, Fiber-Optic Cables, Optical Transmitters and Receivers, Wavelength-Division Multiplexing, Passive Optical Networks.		08 Hrs
UNIT-V		
Cell Phone Technologies: Cellular concepts, Frequency allocation, Frequency reuse. Advanced Mobile Phone System (AMPS) Digital Cell Phone Systems: 2 G, 2.5 G, 3G and 4G cell phone systems, Advanced Cell Phones. Wireless Technologies: Wireless LAN, PANs and Bluetooth, ZigBee and Mesh Wireless Networks, WiMAX and Wireless Metropolitan-Area Networks.		08 Hrs

Course Outcomes: After completing the course, the students will be able to

1	Describe the basics of communication systems.
2	Analyze the importance of modulation and multiple access schemes for communication systems.
3	Compare different telecommunication generations, wired and wireless communication.
4	Justify the use of different components and sub-system in advanced communication systems.

Reference Books	
1	Louis E. Frenzel, "Principles of Electronic Communication Systems", Tata McGraw Hill 3rd Edition 2008, ISBN: 978-0-07-310704-2.
2	Roy Blake, "Electronic Communication Systems", Thomson/Delamar, 2nd edition, 2002, ISB: 978-81-315-0307-2.
3	George Kennedy, "Electronic Communication Systems", Tata McGraw Hill 3rd Edition 2008, ISBN: 0-02-800592-9.

Continuous Internal Evaluation (CIE) (Theory – 100 Marks)	
Evaluation method	Marks
Quiz -1	10
Test -1	50
Quiz -2	10
Test -2	50
Quiz -3	10
Test -3	50
Assignment	10
Final evaluation Quiz 10+10+10; Test 50+50+50 =150 Reduced to 60; Assignment 10	

NOTE: All the three test and quiz are compulsory.

Semester End Evaluation Theory (100)	
Part- –A	
Objective type questions	20
Part –B	
There should be five questions from five units. Each question should be for maximum of 16 Marks. The UNIT-1, UNIT-4 and UNIT-5 should not have any choice.	80
The UNIT-2 and UNIT-3 should have an internal choice. Both the questions should be of the same complexity in terms of COs and Bloom's taxonomy level.	100
Note: The faculty teaching the course may adapt additional methods for evaluation within the total maximum marks.	

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	What	To whom	Frequency of conduction	Max Marks	Evidence	Contribution to Course Outcome		
Direct Methods Assessment	C I E	Quiz	Students	Three	30	Answer Scripts	80 %	90 %
		Test		Three	60/50			
		Assignment/Self-study		2 phases	10/20	Reports / Record Books		
		Laboratory		Weekly				
	S E E	Semester End Examination		End of every semester Consisting of Part-A and Part-B	100	Answer Scripts	20 %	
		Semester End Laboratory		End of every semester laboratory	50			
Indirect Assessment methods	Course End Survey	Students	End of course		Questionnaire Based on COs	10%		

Note: Individual faculty may adopt various methods for conducting effective quizzes and evaluate the same. The frequency of quizzes may be more than three also.

CO-PO Mapping												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	---	1	1	---	---	---	1	---	---	---
CO2	2	1	---	1	1	---	---	---	1	---	---	---
CO3	2	1	---	1	1	---	---	---	2	---	---	---
CO4	1	1	---	1	1	1	---	---	1	---	---	---

Course-PO Mapping												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Course	1	2	1	---	1	---	---	1	2	2	---	---

Low-1 Medium-2 High-3