	ANALOG AND DIGITAL COMMUNICATION SYSTEMS	L T P C 3 0 0 3

COURSE OBJECTIVES:

✓	Apply the concepts of various analog modulation techniques, and performance characteristics in communication systems.
✓	To apply sampling theorem and make use of it in base band communication.
✓	To understand the distortion less transmission and apply the techniques to maximize SNR and minimize ISI in communication system.
✓	To analyze error performance of a digital communication system in presence of noise and other interference.
✓	To apply various theorems and compression techniques to obtain data compression
✓	To study about audio and video electronics

UNIT –1	ANALOG COMMUNICATION TECHNIQUES	8

Applications: Radio, Telephone, Television and Sensors

Generation of AM waves – Double side band with suppressed carrier – Single Side Band with suppressed carrier – Vestigial Side band – Hilbert Transform – Envelop detector – Noise in AM - Super heterodyne radio receivers - Generation of FM waves – Relationship between FM and PM – Narrow band FM – Wide band FM –FM discriminators –Noise in FM

UNIT - 2	PULSE MODULATION SCHEMES	8

Applications: Motor Control, Power regulation, Telephony, Photobiology research- Sampling theorem – Pulse amplitude Modulation – Pulse width modulation - Pulse position modulation - Quantization techniques – Pulse code modulation - Delta modulation–TDM Differential pulse code modulation – FDM

UNIT –3	BASE BAND SHAPING FOR DATA TRANSMISSION	8

Applications: Ethernet, Local Area Networks, Intercom, Internet data buses

Power spectra of discrete PAM signals – NRZ Unipolar, NRZ Polar, NRZ Bi polar, Manchester coding – Detection theory – Optimum filter, Matched filter - Inter symbol interference – Nyquist criterion for distortion less base band transmission – Correlative coding – Eye Pattern –Adaptive Equalization for data transmission

UNIT –4	DIGITALCOMMUNICATION TECHNIQUES	8

Applications: Mobile phone networks, Wireless LAN, Satellite, Data modems

Coherent binary Modulation techniques – BPSK, BFSK, Power spectra - Coherent Quadrature Modulation techniques – QPSK, MSK, Power spectra - Non coherent modulation techniques – DPSK, Non coherent binary FSK – M-Ary Modulation techniques – M-Ary PSK, M-Ary FSK, Power spectra – Carrier Synchronization – Symbol Synchronization

UNIT – 5	INFORMATION THEORY AND CODING	8

Applications: Data compression, Cryptography, Digital storage, Space communication

Uncertainty, Information and Entropy – Source coding theorem – Lossless Compression – Shannon Fano coding, Huffman coding, LZ coding – Channel capacity – Channel coding theorem – Linear block codes – Hamming codes – Cyclic codes – Convolution codes – code tree and trellis encoder and Viterbi decoder.

UNIT –6	BUSINESS STATISTICS AND RECENT TRENDS	5

Applications: Finance, growth and Market

AM/FM Radio Market Report Description - AM/FM Radio Industry Dynamics - AM/FM Radio Market Regional Analysis - AM/FM Radio Market Share (%) by Region (2021-2033) - Key Application of AM/FM Radio - AM/FM Radio market size and its growth rate - Market Definition - In-Scope / Out-Of-Scope - Market Structure – Reports - TV Technology: A Brave New World – Recent growth in television and market price –The future of technology in business statistics.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After completion of this course, the students are able to

CO1	Apply various analog modulation and demodulation techniques to and understand the performance of communication systems
CO2	Apply the principles of sampling and quantization, to describe the performance of pulse communication systems.
CO3	Understand the concepts of ISI to improve the SNR and able to identify the signal in

	the presence of noise.
CO4	Analyze the performance characteristics in terms of probability of error rate, spectral efficiency, and signal-to-noise ratio.
CO5	Apply information theory to detect errors and to compress the data.
CO6	To understand the recent trends in the audio and video electronics
TEXT BOOKS:	
1.	Communication Systems, 5ed, ISV, An Indian Adaptation, TATA McGraw Hill Publications, by Simon Haykin; Michael ;Ajay, ShwetaShah, 2022
2.	Digital Communication Systems, An Indian Adaptation, TATA McGraw Hill Publications, by Simon Haykin | January 2021.
3.	Modern Digital And Analog Communication Systems, 4th Edition, Oxford Press by B.P. Lathi , Zhi Ding, July 2011
REFERENCES:	
1.	Modern communications systems using Matlab, John G Proakis, 6th edition, 2014
2.	A.Papoulis, "Probability, Random variables and Stochastic Processes", McGraw Hill, 3rd edition, 1991.
3.	B.Sklar, "Digital Communications Fundamentals", 2nd Edition Pearson Education, 2009
4.	Sanjay Sharma, "Analog and Digital Communication",3rd EditionS.K. Kataria & Sons.
5.	Thomas M. Cover and Joy A. Thomas, "Elements of Information Theory", 2nd Edition, Wiley-Interscience, 2006.

CO – PO MAPPING

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

	LINEAR INTEGRATED CIRCUITS AND ITS APPLICATIONS	L T P C 3 0 0 3

COURSE OBJECTIVES:

✓	To understand the characteristics of op amp
✓	To design various linear and non linear applications of op-amp
✓	To apply the principle of analog multipliers and PLL systems, along with their applications.
✓	To design multivibrators and oscillators
✓	To design active filters and the voltage regulators
✓	To study the advance technology and statistics used in integrated circuits.

UNIT - 1	OPERATIONAL AMPLIFIER CHARACTERISTICS	8

Applications: *Signal Conditioning, Medical instrumentation*

Basics of op amp - Block diagram representation - Ideal op-amp & Practical op -amp - Open loop & Closed loop configurations - DC & AC performance characteristics of op - amp - Frequency compensation - Noise - Differential amplifiers - Internal schematic of 741 op-amps.

UNIT - 2	APPLICATIONS OF OPAMP	8

Applications: *Radio, Television Transmitters and Receivers*

Inverting and Non - inverting voltage amplifiers - Voltage follower - Summing , Scaling &Averaging amplifiers- Instrumentation Amplifiers - V-to-I & I-to-V converters - Differentiators &Integrators - Log and Antilog Amplifiers - Clipper and Clampers - Precision Rectifiers .

UNIT - 3	ANALOG MULTIPLIERS AND PLL	8

Applications: *Power Monitoring ,Temperature Sensing*

Basic Analog voltage multiplier circuit - Analog multiplier using emitter coupled transistor pair - Gilbert multiplier circuit - Applications of analog multiplier - Operational Transconductance Amplifier (OTA) - Operation of basic PLL - Closed loop analysis of PLL -

Voltage Controlled Oscillator - PLL applications.

UNIT - 4	WAVEFORM GENERATORS	8

Applications: *CPU,GPS, Audio and Video Broadcasting*

Sine wave /Square / Triangle / Saw - tooth Wave generators - IC 555 Timer : Monostable and Astable Multivibrators - operation and its applications - RC Phase Shift Oscillator - Wien Bridge Oscillator

UNIT - 5	ACTIVE FILTERS & VOLTAGE REGULATOR	8

Applications: *Loud Speakers ,Mobile Charger, Computer Power Supplies*

Passive and Active Networks - Comparison - Active Network Design - LPF, HPF, BPF and BSF - Switched Capacitor Filters - Basics of Voltage Regulator - Linear Voltage Regulators using op-amp - IC Regulators (LM 317, LM 337, 723 - Switching Regulators.

UNIT - 6	BUSINESS STATISTICS AND CURRENT TRENDS IN ICs	5

Technology Advancements - 3D Stacking, FinFET Transistors - Advanced Packaging Techniques - Emerging Trends - AI Specific LICs, Automotive Electronics - Emerging Industries - IC Market Share Insights, Economic Significance of LIC Market, MEITY Schemes for IC industry.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course the students will be able to

1.	Describe the characteristics of op-amp which performs mathematical operations.
2.	Design linear and non linear circuits using op-amp
3.	Apply PLL and Multipliers to implement various design applications
4.	Design multivibrators and oscillators using ICs
5.	Design filters and voltage regulators using ICs
6.	Gain knowledge about current technology developments and statistics in integrated circuits

TEXT BOOKS:	
1.	Roy Choudary D and Shail B. Jain, Linear Integrated circuits, 5th Edition, New Age International Publishers, 2018.
2.	Ramakant A.Gayakwad,“Op-Amps and Linear Integrated Circuits”,4th Edition,PHI,2005
3.	J.B. Gupta, "Linear Integrated circuits ",5th edition ,S.K. Kataria & Sons,2004
REFERENCES:	
1.	Robert F. Coughlin, Frederick F. Driscoll, “Operational-Amplifiers and Linear Integrated Circuits”, 6th Edition, Prentice Hall, 2001.
2.	Sergio Franco, “Design with operational amplifier and analog integrated circuits”, McGraw Hill, 1997.
3.	S. Salivahanan and V.S. Kanchana Bhaaskaran, “Linear Integrated Circuits”, 6thEdition, Tata McGraw-Hill, 2011
4.	Mr. D. Nagaraju, Mr. Gangu Rama Naidu, Mr. Sujith Nagaraj, Dr. K. Dhayalini, " Linear Integrated Circuits **",** Quill Tech Publications.
5.	Rishabh Anand ," Linear Integrated Circuits", Khanna Book Publishing January 2014

CO – PO MAPPING

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

	SIGNALS & SYSTEMS	L T P C 3 0 0 3

COURSE OBJECTIVES:

✓	To understand the fundamental concepts and classification of signals and systems.
✓	To applythe properties of Fourier &Laplace Transform in Continuous Time signals .
✓	To apply the propertiesof DTFT &Z - transform in Discrete Time signals.
✓	To analyze CT systems using Fourier and Laplace Transform.
✓	To analyze DT systems using DTFT and Z Transform.
✓	To identify the latest trends in signal processing technologies.

UNIT - 1	INTRODUCTION TO SIGNALS & SYSTEMS	8

Applications:*Electrocardiogram(ECG) Signals*

Time Domain Representation of Continuous Time (CT) and Discrete Time (DT) Signals - Standard Elementary Signals - Operation on Signals - Classification of signals - Classification of systems.

UNIT - 2	FOURIER & LAPLACE TRANSFORM	8

Applications:*JPEG Compression in Image Processing*

Continuous Time Fourier Transform and its Properties - Laplace Transform and its Properties - ROC - Methods to determine Inverse Laplace Transform.

UNIT - 3	DTFT & Z - TRANSFORM	8

Applications:*OFDM used in 4G & 5G Communication*

Sampling Theorem - Discrete Time Fourier Transform (DTFT) and its Properties - Z- Transform and its Properties - Poles & Zeros -ROC - Methods to determine Inverse Z- Transform.

UNIT - 4	TRANSFORM ANALYSIS OF CONTINUOUS TIME SYSTEMS	8

Applications:*Target detection in Defense & Navigation*

Transfer Function - Impulse response of CT Systems - Convolution Integrals- Systemcharacterized by linear constant coefficient Differential Equations- Solution of Difference

equations with initial conditions -Realization in CT Systems.		
UNIT - 5	**TRANSFORM ANALYSIS OF DISCRETE TIME SYSTEMS**	8
Applications:*Noise Cancellation in Headphones* Impulse response of DT Systems -Convolution sum- Discrete Fourier Transform and Z Transform Analysis of Recursive & Non-Recursive systems-Realization in DT Systems.		
UNIT - 6	**BUSINESS STATISTICS AND CURRENT TRENDS**	5
Evolution of signals and systems in modern technology -Global and regional market size of signal processing technologies –Emerging Industries -Policies related to spectrum allocation, signal security, and standardization - Challenges and opportunities for local businesses in adopting modern signal processing -Advancements in real-time signal processing - Application of signal processing in 5G networks.		
TOTAL: 45 PERIODS		

OUTCOMES:

At the end of the course the students will be able to

1.	Describe the fundamentalsof signals and systems.
2.	Apply the properties of Fourier and Laplace Transform in time &frequency domain signals.
3.	Apply the properties of DTFT and z - Transform in time and frequency domain signals.
4.	Analyze the response of Continuous Time systems.
5.	Analyze the responseDiscrete Time systems.
6.	Understand the recent trends in signals and systems.

TEXT BOOKS:

1.	Alan V.Oppenheim, Alan S.Willsky, with S.Hamid Nawab, "Signals and Systems", Prentice-Hall of India, 2nd Edition,2016.
2.	M.J.Roberts, Govind Sharma, "Fundamentals of Signals and Systems", 2nd Edition, Tata McGraw-Hill,2017.
3.	Lathi BP, “Signals, Systems and Communications”, 2nd Edition, BS Publications, 2019.

REFERENCES:	
1.	Simon Haykin, Barry Van Veen, “Signals and Systems”, 2nd edition, Wiley Publications, 2021.
2.	John G. Proakis and Dimitris G. Manolakis "Digital Signal Processing: Principles, Algorithms, and Applications" 4th Edition, 2007.
3.	Alan V. Oppenheim and Ronald W. Schafer "Discrete-Time Signal Processing" 3rd Edition, 2009
4.	Richard G. Lyons "Understanding Digital Signal Processing" 3rd Edition, 2011
5.	S. K. Mitra "Advanced Digital Signal Processing and Noise Reduction" 4th Edition, 2013

CO – PO MAPPING

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

	DIGITAL SYSTEMS DESIGN	L T P C 3 0 0 3

COURSE OBJECTIVES:

✓	To apply Boolean theorems and simplification methods to reduce Boolean Expressions.
✓	To design combinational circuits using Logic gates.
✓	To design synchronous sequential circuits and counters using Flip flops and latches.
✓	To design asynchronous sequential circuits using latches.
✓	To implement combinational and sequential circuits using PLDs.
✓	To identify the recent trends in Digital Electronics

UNIT – 1	**BOOLEAN ALGEBRA**	8

Applications: Computer Systems, Networking, Logic Circuits Design.

Review of number systems - Boolean Algebra and De Morgan's Theorem - SOP & POS forms - Canonical forms - Logical Simplification - Karnaugh maps up to 6 variables - Quine McCluskey method - Gate level Minimization - NAND and NOR implementation.

UNIT – 2	**COMBINATIONAL LOGIC DESIGN**	8

Applications: Scientific calculators. Digital clocks, home security keypads

Combinational circuits - Half and Full Adders - Subtractors - Serial and Parallel Adders - BCD Adder - Carry look ahead adder - Code Conversion - Comparators - Multiplexers - Demultiplexers - Encoder - Decoder - Parity Generator/Checker.

UNIT – 3	**SYNCHRONOUS SEQUENTIAL LOGIC DESIGN**	8

Applications: Clock generation and event counting in CPUs, Microprocessor.

Latches - Flip flops : SR, JK, T, D - Triggering of FF, FF Conversions - Synchronous circuits - Design of synchronous sequential circuits - state table and state diagrams - Moore/Mealy models, Design of Counters - Modulo-n, Johnson, Ring, Up/Down, Shift registers - Types - Universal Shift Register.

UNIT – 4	ASYNCHRONOUS SEQUENTIAL LOGIC DESIGN	8

Applications: High-performance microprocessors, Parallel Computing, Multithreading

Stable and Unstable states - Output specifications - Cycles and races - State reduction - Race free assignments – Hazards - Essential Hazards - Fundamental and Pulse mode sequential circuits - Design of Hazard free circuits.

UNIT – 5	LOGIC FAMILIES AND PROGRAMMABLE LOGIC DEVICES	8

Applications: Home automation devices and Embedded systems

Digital Logic families - Propagation Delay, Fan - In and Fan - Out - Noise Margin - RTL ,TTL,ECL,CMOS - Comparison of Logic families - Implementation of combinational logic/sequential logic design using standard ICs, PROM, PLA and PAL, basic memory, RAM ROM and its Classification

UNIT – 6	BUSINESS STATISTICS AND CURRENT TRENDS	5

New Trends in Digital Systems Design - Increasing Demand for Low-Power Electronics - Digital System Design Market - Quantum Computing - Electronic Design Automation - Miniaturization of Circuits - Multi-Function Counters - High-speed data transmission and networking - Semiconductor Components Market – Market Growth in CMOS and Memory.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course the students will be able to

1.	Apply Boolean theorems and simplification methods to reduce Boolean expressions.
2.	Design Combinational circuits using Logic gates.
3.	Design Synchronous sequential circuits using Flip flops.
4.	Design Hazard free Circuit using Asynchronous sequential circuits.
5.	Implement the Boolean expressions using Programmable Logic devices.
6.	Understand the market trends and recent technology in Digital Electronics.

TEXT BOOKS:

1.	M. Morris Mano and Michael D. Ciletti, 'Digital Design', Pearson, 5th Edition, 2013.
2.	R.P. Jain, "Modern digital Electronics", Tata McGraw- Hill Education, 4th Edition, 2010
3.	R. Anand, Digital System Design Using VHDL, Khanna Book Publishing Company, 2023
REFERENCES:	
1.	Ronald J. Tocci, Neal S. Widmer, and Gregory L. Moss, "Digital Systems: Principles and Applications", Pearson Education, 12th Edition, 2021.
2.	John. F. Wakerly, "Digital Design Principles and Practices", Pearson Education, 4th Edition, 2007.
3.	Charles H. Roth, Jr, 'Fundamentals of Logic Design', Jaico Books, 4th Edition, 2002.
4.	Floyd T.L., "Digital Fundamentals", Charles E. Merril publishing company, 1982.
5.	William I. Fletcher, "An Engineering Approach to Digital Design", Prentice- Hall of India, 1980.

CO – PO MAPPING

	PO											PSO		
CO	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
1	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	-	**-**	**3**	**3**	**3**	**2**
2	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	-	**-**	**1**	**2**	**3**	**2**
3	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	-	**-**	**2**	**3**	**3**	**2**
4	**3**	**3**	**3**	**-**	**-**	**-**	**-**	-	-	**-**	**2**	**2**	**3**	**1**
5	**3**	**3**	**2**	**2**	**-**	**-**	**-**	-	-	**-**	**2**	**3**	**3**	**2**
6	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**	**1**
LOW (1) ; MEDIUM (2) ; HIGH (3)														

(XXXXX) Subject Code	INVENTIVE PRINCIPLES	L T P C 2 0 0 1

COURSE OBJECTIVES:

- ✓ Understand the fundamental concepts of invention, innovation, and creativity through historical case studies of engineering breakthroughs.
- ✓ Learn the 40 Inventive Principles of TRIZ and their application in systematic engineering problem-solving.
- ✓ Gain knowledge about patents, copyrights, trademarks, and the legal framework for protecting innovations
- ✓ Study various knowledge-sharing methods, reverse engineering, and product analysis techniques for innovation development
- ✓ Implement structured methodologies to approach problem-solving in engineering applications
- ✓ Foster creativity and critical thinking skills to develop innovative solutions for complex engineering challenges

UNIT –I INTRODUCTION TO INVENTIVE PRINCIPLES 2

Definition of invention and innovation - creativity – History - Case studies of successful engineering innovations

UNIT –II TRIZ AND SYSTEMATIC PROBLEM SOLVING 2

Inventive Principles of TRIZ - Engineering applications of TRIZ principles - Practical exercises and brainstorming

UNIT –III INTELLECTUAL PROPERTY AND PATENT LAWS 2

Introduction to patents – Types of patents (Utility Patents, Design Patents , Plant Patents , Provisional Patents , Non-Provisional Patents , Software Patents , Business Method Patents) – comparison - copyrights and trademarks - Patent filing process and IP rights

UNIT –IV OPEN-SOURCE INNOVATION AND KNOWLEDGE SHARING 2

Methods of problem identification, Reverse engineering and product analysis- Future Trends and Innovations

UNIT –V ETHICS IN ENGINEERING AND INNOVATION 2

Importance of ethics in engineering - Professional codes of ethics (IEEE, ASME, ASCE, etc.)

Case studies of ethical dilemmas in engineering.

UNIT –VI PRACTICAL IMPLEMENTATION & CASE STUDIES 2

Case studies of famous Patent and their impact analysis on industry, economy, and society

TOTAL: 12 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

1. Demonstrate an understanding of how engineering innovations emerge and their impact on society
2. Utilize systematic TRIZ-based approaches to address engineering challenges effectively
3. Understand the importance of intellectual property protection and the procedures involved in securing patents.
4. Apply open-source methodologies, reverse engineering, and product analysis for innovative problem-solving
5. Evaluate past engineering innovations to extract key lessons and best practices
6. Create and refine innovative ideas using structured methodologies like TRIZ and other inventive principles

TEXT BOOKS:

1. "And Suddenly the Inventor Appeared: TRIZ, the Theory of Inventive Problem" Solving, Genrich Altshuller, Technical Innovation Center, Inc., 2nd Edition, 1996.
2. "Engineering Design: A Project-Based Introduction", Clive L. Dym, Patrick Little WileyPublisher, 4th Edition, 2013.
3. "Intellectual Property: Patents, Trademarks, and Copyright, Richard Stim Cengage LearningPublisher, 14th Edition, 2020.
4. "Open Innovation: The New Imperative for Creating and Profiting from Technology", Henry Chesbrough, Harvard Business Review Press, 1st Edition, 2003.

REFERENCE BOOKS:

1. "TRIZ for Engineers: Enabling Inventive Problem Solving", Karen Gadd, Wiley Publisher, 1st Edition, 2011.
2. "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail", Clayton M. Christensen,Harvard Business Review Press, 1st Edition, 1997.
3. "Engineering Ethics: Concepts and Cases", Charles E. Harris Jr., Michael S. Pritchard, Michael J. Rabins, Cengage LearningPublisher, 6th Edition, 2018.
4. "Reverse Engineering: Mechanisms, Structures, Systems & Materials", Wego Wang CRC Press, 1st Edition, 2010.

(XXXXX) Subject Code	LIFE SKILL IV – PUBLIC SPEAKING PRACTICES	L T P C 2 0 0 1

COURSE OBJECTIVES:

- ✓ To develop proficiency in public speaking, including its history, significance, and benefits. **(C 18)**
- ✓ To explore the history and evolution of public speaking. **(C 19)**
- ✓ To engage with the audience, especially in high-pressure situations like press meets.
- ✓ To apply structured debate formats to evaluate arguments critically and develop reasoning skills.
- ✓ To synthesize and articulate ideas effectively by engaging in complex and abstract discussions
- ✓ To demonstrate public speaking skills in real-world contexts by presenting on topics related to education, history, entertainment, and current affairs.

UNIT - I BASICS OF PUBLIC SPEAKING 2

History of public speaking – benefits

Practice :Effective practices for public speaking- Public speaking topics

UNIT - II LISTENING TO FAMOUS SPEECHES 2

TED talks – presentations, Josh talks **(C 20)**

Practice: Key elements of TED talk presentations - prioritize simplicity in visuals and strong stage presence

UNIT - III RESPONDING AND TACKLING THE QUESTIONS 2

Facing the audience (Press meet)

Practice: Engaging with the audience in a press meet – Handling Challenging questions **(C21)**

UNIT - IV GROUP DEBATE 2

Dos and Don'ts of group debate – Practicing various types of debate format **(C 22)**

Practice : Structuring a debate session - Focusing on moral reasoning **(C 23)**

UNIT - V GROUP DISCUSSION LEVEL 2 2

Engaging in discussions on complex and contemporary topics **(C 24)**

Practice: Argument structure & logical flow

UNIT - VI PUBLIC SPEAKING PRACTICES 2

Topics in Education, History, Entertainment, Current affairs

Practice: Content, delivery, engagement, and overall effectiveness

TOTAL: 12 PERIODS

OUTCOMES:

At the end of the course the students would be able to

1. Initiate and manage professional conversations with correct greetings and courtesies.
2. Demonstrate proficiency in asking clear and appropriate questions in professional and technical conversations.
3. Adjust their tone and intonation based on the context of the conversation.
4. Demonstrate confidence in handling one-on-one interviews and personal conversations through effective communication strategies.
5. Students will be able to formulate and ask open-ended brainstorming questions.
6. Understand the importance and purpose of group discussions in professional and academic settings.

REFERENCES:

1. "Advanced Communication Skills" by Mathew Richardson, Charlie Creative Lab, 2020
2. Andy Gillett, Using English for Academic purposes for students in higher Education. https://www.uefap.org/reading/
3. Meenakshi Raman & Sangeeta Sharma (2017). Technical Communication: Principles and Practice (3rd Edition). Oxford University Press, India.
4. Rajendra Pal & J.S. Korlahalli (2011). Essentials of Business Communication. Sultan Chand & Sons, New Delhi.

CO – PO MAPPING

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
2	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
3	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
4	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
5	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
LOW (1) ; MEDIUM (2) ; HIGH (3)															

	ANALOG AND DIGITAL COMMUNICATION LAB	L T P C 0 0 3 1.5
COURSE OBJECTIVES:		
✓	Design AM and FM modulation and demodulation circuits and gain the knowledge in analog communication systems	
✓	Design A/D converter and construct circuit to test pulse modulation scheme.	
✓	Design encoding system to reduce the probabilities of error in passband communication.	
LIST OF EXPERIMENTS:		
1.	Design and construct the analog modulation scheme to generate AM wave and reconstruct the original signal.	
2.	Design and construct the analog modulation scheme to generate FM wave and reconstruct the original signal.	
3.	Design and construct the circuit to convert an analog waveform into discrete digital waveform.	
4.	Design and construct the circuit to test the output waveforms of PAM, PPM and pulse width modulation scheme for the better base band transmission.	
6.	Construct a pulse code modulation circuit and differential pulse code modulation circuit and analyzeits performance characteristics to transmit the encoded signal.	
7.	Construct the delta modulation and adaptive delta modulation circuit to find thesuitable quantizer network to transmit the sampled signals.	
8.	Construct and find the error probability of coherent amplitude shift keying and binary phase shift keying.	
9	Construct and draw the constellation diagram of coherent binary frequency shift keying and Quadrature phase shift keying.	
10.	Simulation: AM and FM	
11.	Simulation: Sampling theorem, PAM, PPM, PWM, PCM and DM	
12.	Simulation: BPSK, BFSK, QPSK, Convolutional codes and Linear block codes	
		TOTAL : 30 PERIODS
COURSE OUTCOMES		
After the completion of this laboratory course, the students will be able to		
1.	Design AM and FM circuits to transmit and receive AM and FM signal.	
2.	Develop different pulse modulation circuit with suitable quantization technique to reduce the error rate and noise in base band transmission.	
3.	Design different shift keying methods to transmit the digital signals in pass band communication.	

LABORATORY REQUIREMENTS: **TOTAL: 30 STUDENTS**

MAJOR EQUIPMENTS

TrainerKitsforAM, FM, – Each2 Nos

TrainerKits for Signal Sampling,PAM,PPM andPWM, TDM–Each 2 Nos

TrainerkitsforPCM, DM,DPCM,ADMandLineCodingSchemes-Each2 Nos

Trainerkitsfor ASK,PSK, FSK,QPSK -Each2Nos

AMandFM–TransreceiverTrainerKits–Each2Nos

CRO/ DSO – 30 MHz–15 Nos

SpectrumanalyzerwithTrackingGenerator- 1Nos

Functiongenerator –2MHz– 15Nos

RegulatedPowerSupply–(0-30V) / 2A– 5Nos

Matlab or Lab View or equivalentopen sourcesoftware –5 users

Desk top computers – 15 Nos

Bread Board – 10 nos

Consumables

CO – PO MAPPING

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

	LINEAR INTEGRATED CIRCUITS LAB	L T P C 0 0 3 1.5

COURSE OBJECTIVES:

✓	To design arithmetic and logical functional circuits using IC 741.
✓	Todesign active filters and wave form generators using operational amplifier IC 741.
✓	To design wave shaping networks and comparators using IC 741

LIST OF EXPERIMENTS:

1.	Design and test the inverting and non-inverting amplifier configurations, measuring gain and verifying their behavior using op-amp IC 741.
2.	Design and test op-amp circuits that perform addition and subtraction of input signals using IC 741.
3.	Design and explore the use of op-amps as comparators to detect voltage levels or to compare the signals using IC 741.
4.	Design and explore the use of op-amps to build high-gain, low-noise instrumentation amplifiers using IC 741.
5.	Design and test circuits that generate sinusoidal waveforms, such as Wien bridge and RC phase-shift oscillators using op – amp IC 741.
6.	Design and implement the first-order and higher-order active low-pass (LPF), high-pass (HPF), and band-pass filters using op-amp IC 741.
7.	Design and test circuits that convert a signal into a square wave or pulse based on threshold levels with the help of operational amplifier IC 741.
8.	Design and explore the use of op-amplifier IC 741 to generate various waveforms like sine, square, and triangular waveforms.
9.	Design and test circuits that perform the function of integration and differentiation for the given input signals.
10.	Design and construct the astable multivibrator circuit to generate the square wave form using IC 555.
11.	Simulation: Differentiator, Integrator, Clipper, Clamper, Schmitt trigger and Multivibrators

TOTAL : 30 PERIODS

COURSE OUTCOMES

After the completion of this laboratory course, the students will be able to

1.	Design and verify arithmetic and logical functions using IC 741.
2.	Design and implement filters and waveform generators using IC 741
3.	Design circuits tocompare andto change the shape of input signals using IC 741.

LIST OF MAJOR EQUIPMENTS FOR A BATCH OF 30 STUDENTS

1) Digital IC trainer kit - 10 Nos
2) Dual RPS (0 - 30)V / 2A – 10 Nos
3) +/- 15 V / 2A - fixed power supply – 10 Nos
4) +/- 5V / 2A - fixed power supply – 10 Nos
5) Function Generator 2 MHz – 10 Nos
6) Cathode Ray Oscilloscope 30 MHz – 10 Nos
7) Bread Board – 10 Nos
8) P spice or Lab view - open source simulation software – 5 Nos
9) Desk top computers – 10 Nos

CONSUMABLES

1) OP-AMP IC 741, IC 353, LM 354, LM356, NE 555 each 10 nos

2) Resistors, 3) Capacitors, 4) Transistors, 5) Diodes

CO – PO MAPPING

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