2	To investigate the logic behavior of various logic gates (NAND, NOR, NOT, AND, OR, XOR)	**1**
3	To simulate and Implement a logic function using logic gates.	**1**
4	To design, simulate and Implement Adder and Subtractor circuits.	**1**
5	To design, simulate and implement code converters.	**2**
6	To design, simulate and implement combinational circuits using Multiplexers.	**1**
7	To simulate and implement Flip-flops using NAND and NOR Gates.	**1**
8	To study the operation of shift register.	**1**
9	To study the operation of counter ICs.	**1**
10	To design, simulate and implement the synchronous sequential circuits.	**2**
11	To design an application based on digital circuits.	**2**

Course Outcomes:	
1	Identify the components and design combinational and sequential circuits using them.
2	Compare the different logic families, memories and A/D-D/A converters.
3	Design an application based on digital circuits.

Suggested Books:

Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	Digital Design by Morris Mano, PHI, 4th edition	2008
2	Digital principles and Applications, by Malvino Leach, TMH	2011
3	Digital System Principles and Applications, by R J Tocci (PHI)	2009
4	Modern Digital Electronics, by R P Jain, TMH	2006
5	Digital Integrated Electronics, by Taub Schilling, TMH	2004

Course Name	**:**	**COMMUNICATION ENGINEERING**
Course Code	**:**	**ECN 201**
Credits	**:**	**4**
L T P	**:**	**3-1-0**

Course Objectives:

By the end of this course, the students should be able to analyse a transmission line, do transmission line calculations using smith chart, design rectangular and circular waveguides, explain various analog modulation techniques, their generation and detection, and enlist the various functional blocks in analog communication receiver and transmitter. The students should also be able to describe the basic radiating antennas, antenna arrays, calculate the basic antenna parameters, and identify antenna specifications.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1.	**TRANSMISSION LINES:** Concept of Distributed elements, Equations of Voltage and Current, Types of Transmission lines, Standing Waves and Impedance Transformation, Lossless and Low loss Transmission lines, Power transfer on a transmission line, Transmission line calculations using Smith Chart ,Applications of transmission lines	7
2.	**WAVEGUIDES:** Rectangular Waveguides, Field analysis and characteristics of TE and TM modes, Losses in waveguides, Circular waveguides	7
3.	**INTRODUCTION TO COMMUNICATION SYSTEMS:** Principles of Communication Signal to Noise Ratio, Channel Bandwidth, Rate of	2

	Communication, Modulation.	
4.	**AMPLITUDE MODULATION:** Base band and carrier communication, Amplitude modulation: Double side Band (DSB), Single Side Band (SSB), Vestigial Sideband (VSB), AM Receiver.	7
5.	**ANGLE MODULATION:** Concept of Instantaneous Frequency, Bandwidth of Angle Modulation, Generation of FM wave, Demodulation of FM, Interference of Angle Modulated Systems, FM Receivers.	7
6.	**PULSE MODULATION SYSTEMS:** Sampling theorem, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation, Pulse Code Modulation, Differential PCM, Delta Modulation, Adaptive Delta Modulation.	4
7.	**ANTENNAS AND WAVE PROPOGATION :** The Potential Functions, Elemental Dipole Antennas (The Electric (Hertzian) Dipole, Magnetic Dipole (Loop), Antenna Characteristics, The Long Dipole and Monopole Antennas, Antenna Arrays, Antenna Directivity and Gain, Antenna Coupling, The Friis Transmission Equation, Effect of Ground Reflections on Signal Transmission, Introduction to wave propogation.	8

Course Outcomes: By the end of this course, the students will be able to	
1.	Calculate the basic transmission line parameters, mathematically and using the Smith chart and design impedance matching devices.
2.	Analyse and design rectangular and circular waveguides.
3.	Explain the block diagram of analog communication system and various modulation techniques.
4.	Compute antenna parameters and draw radiation patterns.

Suggested Books:

Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1.	Electronic Communication Systems by G. Kennedy And B. Davis, Mc Graw Hill, 4th Edition	2006
2.	Elements of Electromagnetics by Mathew N.O. Sadiku, Oxford, Sixth Edition	2014
3.	Modern Digital & Analog Communication Systems by B.P. Lathi, Oxford University Press,4th Edition	2009
4.	Electronic Communications,4th Edition, Roddy &Coolen, Prentice Hall	1995
5.	Electromagnetic Waves by RK Shevgaonkar, Tata McGraw-Hill Education	2005
6.	Electromagnetic Waves & Radiating Systems, 2nd Edition by Jordan& Balmain	1968

Course Name	**:**	**SIGNALS AND SYSTEMS**
Course Code	**:**	**ECN 202**
Credits	**:**	**4**
L T P	**:**	**3-1-0**

Course Objectives:

At the end of this course, students should be able to

Analyze continuous and discrete time signals and systems.

Analyze communication systems in time and frequency domain.

Comprehend signals based on Fourier transform and study the impulse response of RC &RL networks, pulse response of RL, RC networks.

Total No. of Lectures – 42

Lecture wise breakup	**Number of Lectures**

1	Describe the fundamentals of feedback amplifiers and oscillators.
2	Draw outputs of the wave shaping circuits and explain operational amplifier along with its applications.
3	Identify the multivibrator circuits and explain the basic principle of phase locked loop.
4	Demonstrate the working behavior of devices and circuits and their applications.

Suggested Books:		
Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	Op-amps and linear integrated circuits by Ramakant A Gayakward Prentice hall 4th edition	2000
2	Electronics Devices & Circuit Theory, RL Boylestead & L Nashelsky, PHI	2008
3	Microelectronic Circuits, AS Sedra & KC Smith, OXFORD	2003
4	Electronics Circuit Analysis and Design, Donald A. Neamen, Tata McGraw Hill	2009

Course Name	**:**	**ENGINEERING ANALYSIS AND DESIGN**
Course Code	**:**	**ECN 206**
Credits	**:**	**4**
L T P	**:**	**3-0-2**

Course Objectives:
At the end of this course, the students should be able to familiarize with the new concepts towards simulation and automation. The students should also be able to demonstrate to control any device by interfacing a computer.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1.	**INTRODUCTION TO SYSTEM MODELLING** Basic simulation modeling review of probability and statistics, random number generation.	**8**
2.	**PROGRAMMING & SIMULATION WITH LAB VIEW** Components, tools, controls & indicators, Local and Global variables, shift registers, formula node, arrays & clusters, data acquisition, instrument interfacing, interfacing of sensors, design of combinational and sequential circuits. applications based on lab view.	**15**
3.	**PROGRAMMING AND SIMULATION WITH MATLAB** Introduction to MATLAB, data types, 2D-3D plotting, histogram, polar plots, matrix manipulation, 2D-3D matrix visualization, spectral analysis of various signals, solving linear / non linear equations, system design & simulation with SIMULINK, use of Communication & Signal Processing tool boxes.	**15**
4.	**CASE STUDIES** Based on Analog / Digital Circuits	**4**

List of Experiments:		**Number of Turns**
1.	Write a program to count Modulus 32 and display the values in decimal, Hexadecimal, octal and binary.	**1**
2.	Set up a temperature simulator. Set up over and under temperature LEDs to light up whenever the deviation is>5ºC. The loop should operate once every second.	**1**
3.	Build a Four-Function Calculator.	**1**
4.	Build a VI to compute and display the linear equation.	**1**
5.	Write a simple program to generate a Voltage at Analog Output 0 using a knob to select the voltage. Verify using a multimeter.	**1**
6.	Design an astable multivibrator circuit and verify the frequency of its output signal by using ELVIS instrument.	**1**

7.	Spectral analysis of various types of signals.	**1**
8.	Generation of Digital Signals.	**1**
9.	Design & Simulation of Filters.	**2**
10.	Design & Simulation of Various Modulation and Demodulation circuits such as AM, FM, PM, ASK, PSK, FSK.	**2**
11.	Simulation of Digital Controllers.	**1**

Course Outcomes: By the end of this course, the students will be able to:	
1	Model a given system
2	Describe the fundamentals of lab view and design & simulate a given system.
3	Analyze, design & simulate various electronic circuits.

Suggested Books:		
Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	Simulation Modelling and Analysis, Averill M.Law and W.David Kelton, McGraw Hill Publications.	**Latest Edition**
2	Getting Started with MATLAB by Rudra Pratap, Oxford University Press.	**Latest Edition**
3	Virtual Instrumentation using Lab View, Electrical Engineering Series by Sanjay Gupta & J.John, Tata McGraw Hill	**Latest Edition**

Course Name	**:**	**COMPUTER NETWORKS**
Course Code	**:**	**ECN 207**
Credits	**:**	**4**
L T P	**:**	**3-1-0**

Course Objectives:
By the end of this course, the students should be able to define the basic concepts of Data communication with different models, classify and compare the physical layer, Data Link Layer, Network Layer and Transport Layer and their functions. The students should also be able to summarize the switching concept, its different types and explain the working of various types of wireless networks and their protocol.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1	**OVERVIEW OF DATA COMMUNICATION AND NETWORKING**: Data communications, Networks, The Internet, Protocols and standards, Layered tasks, OSI model, TCP /IP protocol Architecture, History of the computer network	3
2	**PHYSICAL LAYER:** Data rate limit, Transmission impairments, Line coding, Block coding, Sampling, Transmission mode, Modulation of digital data, Telephone modems, Modulation of analog signal, FDM, WDM, TDM, Guided media, Unguided media	5
3	**DATA LINK LAYER:** Types of errors, Detection, Error correction, Flow and error control, Stop and wait ARQ, go back n ARQ, Selective repeat ARQ, HDLC, Point to point protocol, PPP stack, Random access, Controlled access, Channelization, Traditional Ethernet, Fast Ethernet, Gigabit Ethernet	8
4	**NETWORKING AND INTERNETWORKING DEVICES:** Repeaters, Bridges, Type of Bridges, Routers, Routing concepts, Gateways, Internetworks, ARP, IP, ICMP, IPV6, Unicast routing, Unicast routing protocol, Multicast routing,Multicast routing protocols, introduction to Security, Cryptography, and SSL, Security - firewalls,	8

	DoS, etc.	
5	**TRANSPORT LAYER:** Process to process delivery, User datagram protocol (UDP), Multiplexing and Demultiplexing, Connection less transport (UDP), Principles of reliable data transfer, Transmission control protocol (TCP), Data traffic, Congestion, Congestion control, Quality of service	5
6	**APPLICATION LAYER:** DNS, Electronics mail architecture and services, message formats and transfers, WWW architectural overview, static and dynamic web pages, HTTP, Digital audio and video	4
7	**WIRELESS NETWORKS:** Cordless system, Wimax and IEEE 802.16 broadband wireless access standards, Mobile IP, Wireless Application Protocol, IEEE 802 Architecture, IEEE 802.11 Architecture and Services, IEEE 802.11 Medium Access Control, IEEE 802.11 Physical Layer, Other IEEE 802.11 Standards, Wi-Fi Protocol Access, Bluetooth and IEEE 802.15, ad-hoc wireless, and sensor networks.	5
8	**SWITCHING:** Circuit Switching, Space division switching, Time division switching, Space and time division switching combinations, Packet switching, Data gram approach, Virtual circuit approach, message switching, Network Layer connection oriented and connectionless services, ATM, ISDN, MPLS, GMPLS.	4

Course Outcomes: By the end of this course, the students will be able to	
1	Describe the computer network system and its communication.
2	Identify and compare the various layers of a computer network model, their role and characteristics.
3	Explain various routing algorithms and switching concepts.
4	Identify the various wireless network models.

Suggested Books:		
Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	Introduction to Data Communication & Networking by Behrouz Forouzan, Tata McGraw Hill Edition	2012
2	Data and Computer Communications by William Stallings PHI 8th Edition.	2007
3	Data Communication and Distributed Networks, Ulylers D. Black, PHI 3rd ed.	1999
4	Computer Networks, Andrew S.Tanenbaum, , PHI 2nd ed.	2000

Course Name	**:**	**VLSI DESIGN**
Course Code	**:**	**ECN 208**
Credits	**:**	**4**
L T P	**:**	**3-0-2**

Course Objectives:
By the end of this course, the students should be able to explain the MOS physics and its scaling effects, describe the fabrication process and mask designing of VLSI circuits. The students should also be able to design the basic CMOS circuits like inverters, combinational and sequential circuit, classify the static and dynamic behavior of CMOS circuits and compare the operation of semiconductor memories.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1	**PHYSICS AND MODELING OF MOSFETS**: Basic MOSFET Characteristics – Threshold Voltage,Body Bias concept, Gradual Channel	8

	Approximation, Current-Voltage Characteristics – Square-Law Model, MOSFET Modeling – Drain-Source Resistance, MOSFET Capacitances, Short Channel Effects, Geometric Scaling Theory and its effects– Full-Voltage Scaling, Constant-Voltage Scaling.	
2	**FABRICATION AND LAYOUT OF CMOS INTEGRATED CIRCUITS:** Overview of Integrated CircuitProcessing – Oxidation, Photolithography, Self-Aligned MOSFET, Isolation and Wells – LOCOS, Trench Isolation, CMOS Process flow, Stick Diagram and Layout – MOSFET Dimensions, Design Rules, Latch-up.	4
3	**MOS INVERTERS:** CMOS Inverter: Resistive load inverter, nMOS load inverter, CMOS inverter, switching threshold and noise margin concepts and their evaluation, switching characteristics- delay time calculation.	7
4	**COMBINATIONAL MOS LOGIC CIRCUITS:** Switching Properties of MOSFETs: nMOSFET/ pMOSFET Pass Transistors, Transmission Gate Characteristics, MOSFET Switch Logic, TG-based Switch Logic, MOS and CCOS logic circuits, Power Dissipation in CMOS Digital Circuits	5
5	**DYNAMIC LOGIC CIRCUIT CONCEPTS AND CMOS DYNAMIC LOGIC FAMILIES:** Charge Leakage, Charge Sharing, Dynamic RAM Cell, Bootstrapping, Clocked-CMOS, Pre-Charge/ Evaluate Logic, Domino Logic, Multiple-Output Domino Logic, NORA Logic, Single-Phase Logic.	8

List of Experiments:		**Number of Turns**
1	Familiarization with Simulation Softwares for schematic and layout entry, circuit simulation	2
2	DC transfer Characteristics of Inverters, Transient response, Calculating propagation delays, rise and fall times	2
3	Implementation of Boolean logic using S-Edit for static logic.	2
4	Implementation of Boolean logic using L-Edit for static logic, Design Rule Check (DRC), Electrical Rule Check (ERC) generation of layout and extraction.	2
5	Design of flip-flops, counters, registers using HDL	2
6	Design of state machines using HDL at various abstraction levels	2
7	Creating test benches, Synthesis using FPGA kits	2

Course Outcomes: By the end of this course, the students will be able to	
1	Describe the Physics of MOS device.
2	Classify the CMOS process technology and layout design.
3	Identify the characteristics of CMOS circuits and will be able to design the CMOS circuits using VLSI CAD tools.
4	Compare between static and dynamic CMOS logic circuits.
5	Classify the various semiconductor memories.

Suggested Books:		
Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	CMOS Digital Integrated Circuits – Analysis and Design, S. Kang and Y. Leblebici, Tata McGraw Hill 3rd ed.	2008
2	CMOS VLSI Design: A Circuits and Systems Perspective, N.H.E. Weste and K. Eshraghian, Addision Wesley 2nd ed.	1998
3	Digital Integrated Circuits – A Design Perspective, J.M. Rabaey, A.P. Chandrakasen and B. Nikolic, Pearson Education 2nd ed.	2007
4	CMOS Circuit Design, Layout and Simulation, R.J. Baker, H. W. Lee, and D. E. Boyce, Wiley - IEEE Press 2nd ed.	2004

Course Name	**:**	**DIGITAL SIGNAL PROCESSING**
Course Code	**:**	**ECN 209**
Credits	**:**	**4**
L T P	**:**	**3 0 2**

Course Objectives:
By the end of this course, students should be able to define concepts of DSP such as LTI Systems, stability, causality and differential equations, explain various transformation and design techniques and implementation of IIR and FIR filters.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1	**TRANSFORMATION OF DISCRETE SIGNALS** Typical applications of DSP, Discrete Fourier Transform(DFT) and its properties, IDFT, Fast Fourier Transform (FFT), Decimation in time and decimation in frequency algorithms, IFFT	8
2	**DIGITAL FILTERS** Recursive and non recursive systems, Frequency domain representation of discrete time systems, systems function, Ideal low pass filter	4
3	**DESIGN OF IIR FILTERS** Impulse invariance transformation technique, Bilinear transformation, Design of IIR Filters using Butterworth, chebyshev and elliptic filter , Digital frequency transformation	9
4	**DESIGN OF FIR FILTERS** Design of FIR filters using Window technique, frequency sampling technique, Equiripple Approx. technique, comparison of IIR and FIR filters	8
5	**REALIZATION OF DIGITAL SYSTEMS** Block diagrams and signal flow graphs for FIR and IIR systems, Direct form, cascade and parallel form realization of FIR and IIR systems.	4
6	**DSP PROCESSOR** Introduction to fixed point and floating point processors , architecture of a DSP processor	2
7	**MULTIRATE DSP & APPLICATIONS** Multirate DSP and its applications, Decimation, Interpolation, Sampling Rate Conversion	4
8	**ADAPTIVE WEINER FILTER** Adaptive Weiner filter & its application in echo cancellation and equalization	3

List of Experiments:		**Number of Turns**
1	Hands on Experience on MATLAB and generation of digital signals	1
2	Write a Program for Discrete Convolution, Impulse Response of finite and infinite signals	1
3	Determine and plot Fourier Transform (magnitude and phase) for the infinite duration sequence.	1
4	For a Given a Causal System determine Impulse Response.	1
5	Determine convolution of two signals.	1
6	Determine impulse response and unit step response of the given system.	1
7	Determine frequency response of any LTI system.	1
8	Determine DTFT of the given sequence and plot magnitude and phase response.	1
9	Design an FIR low pass filter for the given specifications and plot frequency response of the filter.	1
10	Design a LP Butterworth filter for the given specifications and plot frequency response of the filter.	1
11	Compute DFT and IDFT for the given signal.	1
12	Compute FFT of a real time input signal using DSP kits.	2

Course Outcomes: By the end of this course student will be able to:	
1	Define LTI systems transform ,DTFT ,FFT
2	Explain various design techniques of IIR and FIR digital filters
3	Explain the realization of IIR and FIR filters
4	Outline the concept of DSP processor

Suggested Books:		
Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	Digital Signal Processing by Proakis & Manolakis, Pearson Education	Latest Edition
2	Digital Signal Processing by A.V Oppenheim and R.W.Schafer, Pearson Education	Latest Edition
3	Digital Signal Processing by E C Ifeachor and B W Jervis.	Latest Edition
4	Digital Signal Processing by S Salivahanan, A Vallavraj, C Gyanapriya, TMH	2011
5	Digital Signal Processing By S. K. Mitra, TMH	2010

Course Name	**:**	**COMMUNICATION THEORY**
Course Code	**:**	**ECN 210**
Credits	**:**	**4**
L T P	**:**	**3-1-0**

Course Objectives:
At the end of this course, the students should be able to evaluate the signals at input and output of a communication system and analyse the performance of basic communication system in terms of on signal transmission through linear networks and noise.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1	**RANDOM SIGNALS:** Definition of a random process, stationarity, ensemble averages, Power spectral density, cross spectral density, Gaussian process.	6
2	**RANDOM SIGNAL THEORY:** Probability, random variables, probability density, statistical moments, different density functions, sum of random variables, transformations of density functions, correlation functions, random processes, correlation functions of random processes, spectral density, white noise	9
3	**SIGNAL TRANSMISSION THROUGH LINEAR NETWORKS:** Convolution theorem, frequency domain analysis, bandpass networks, ideal transfer functions-amplitude distortion , phase distortion, optimum filters, matched filters, minimum mean square error criteria, calculation ,	9
4	**INPUT-OUTPUT RELATIONS WITH RANDOM INPUTS:** Probability density input-output relationships, equivalent noise bandwidth, envelope of sine wave plus gausian noise.	9
5	**NOISE AND INTERFERENCE:** Classification of noise, sources of noise, atmospheric noise, shot noise, thermal and white noise, noise spectral density, noise calculations, Noise Figure of Devices, Circuits and Cascaded Networks, Experimental Determination of NF, Noise Calculations for different Communication Systems.	9

Course Outcomes:	
1	A fundamental understanding of various Laws of thermodynamics and their applications.
2	Understand the efficiencies of Heat Engines and other Engineering Devices.
3	Understand the working principles and applications of various types of steam generators.

Suggested Books:

Sr. No.	Name of Book/ Authors/ Publisher	Year of Publication/ Reprint
1	"Engineering Thermodynamics", Gordon Rogers & Yon Machew	2006
2	"Thermodynamics", Yunus Cengel and Mike Boles	2006
3	"Thermodynamics", Arora.	2005
4	"Engineering Thermodynamics", P.K. Nag	2010
5	"Thermo dynamics", Dr. D.S. Kumar	2012

Course Name	**:**	**ESSENTIALS OF INFORMATION TECHNOLOGY**
Course Code	**:**	**ESC202**
Credits	**:**	**4**
L T P	**:**	**3 1 0**

Course Objectives:
The students should be able to understand the concepts of networking, RBMS, Software Engineering and Web Technology.

Total No. of Lectures – 42

Lecture wise breakup		Number of Lectures
1	**NETWORKING AND COMMUNICATION** Introduction to digital communication: Signal propagation, signal types, signal parameters, Channel effect on transmission. Physical layer characterization: Types of transmission media, physical layer interfaces. Data transmission mechanisms: Communication modes, transmission modes, synchronization, introduction to packet switching, multiplexing, error control methods. Network architectures: Introduction to computer networks, Network topologies, Types of networks: LAN, WAN, MAN, layered network model. Internet Protocols: Introduction, Transport layer protocols: TCP, UDP. Application layer protocols: DNS, SMTP, POP, IMAP. Practical aspects of networking.	**12**
2	**RELATIONAL DATABASE MANAGEMENT SYSTEM** RDBMS- data processing – the database technology – data models- ER modeling concept – notations – converting ER diagram into relational schema - Logical database design - normalization (1NF, 2NF and 3NF). SQL – DDL statements – DML statements – DCL statements - Joins - Sub queries – Views - Database design Issues – SQL fine tuning.	**10**
3	**WEB TECHNOLOGIES AND INTRODUCTION TO USER INTERFACE AND WEB TECHNOLOGIES :** web fundamentals – types web content – HTML – text formatting tags in HTML – HTML form elements - and tags - text formatting using CSS : embedded CSS, inline CSS and external CSS – JavaScript and its features.	**10**
4	**SOFTWARE ENGINEERING** Software Engineering : Definition – role of software and software crisis – SDLC models : waterfall model, incremental model and spiral model – software testing – static & dynamic testing – types testing : unit testing, integration testing, system testing, performance testing and regression testing.	**10**

Course Outcomes:

Course Name	**:**	**TECHNICAL COMMUNICATION**
Course Code	**:**	**XXX-205**
Credits	**:**	**2**
L T P	**:**	**0-0-3**

Course Objectives:
At the end of the course the students should be able to effectively communicate as per their professional requirements.

Total No. of Lectures – 42

Lecture wise breakup		**Number of Lectures**
1	Need for Effective Communication, Overview of Technical and Professional communication	**3**
2	Listening Skills, Reading Skills, Writing Skills	**3**
3	Writing Letters, Official E-mails, Job Applications, Resumes, Cover Letters, Notes. Case Studies	**6**
4	Overview of Research Writing. Information Gathering; Using the Library and Internet Modes, Organizing and Presenting According to Audience and Purpose. Writing Research Proposals, Project Technical Report/ Dissertation/Theses Writing. Case Studies.	**12**
5	Presentation Skills, Interview Skills, Group Discussion skills, Case Studies.	**9**
6	Technology Based Communication- Use of Visuals and Audio to Communicate Effectively.	**3**
7	Ethics, Attitude and Team Communication	**3**
8	Social Media/ Online Communication, Public Speaking; Developing an Authorial Voice	**3**

Course Outcomes: By the end of this course the student will be able to	
1	Develop effective technical communication.
2	Write technical documents in a professional manner.
3	Present professional requirements in an effective manner

Suggested Books:		
Sr. No.	**Name of Book/ Authors/ Publisher**	**Year of Publication/ Reprint**
1	Meenakshi Raman and Sangeeta Sharma, "Fundamentals of Technical Communication", Oxford University Press, India	2014
2	Barun K Mitra, "Effective Technical Communication- A Guide for Scientists and Engineers" ,Oxford University Press, India	2006
3	David f Beer and David McMurrey, " Guide to Writing as an Engineer" ,2nd ed., Wiley	2004
4	Diane Hacker, " Pocket Style Manual", Bedford/St martin's.	2003