C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology & Engineering (Diploma Engineering)
DEPARTMENT OF: -Electronics & Communication Engineering
SEMESTER: -__IV__   **CODE**: -2TE04LIC1
NAME –Linear Integrated Circuits (LIC)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total
							Theory				Practical (Marks)			
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
2TE04LIC1	Linear Integrated Circuits (LIC)	03	00	02	05	04	30	1.5	70	03	30	20	---	150

Objectives:-
- To developed the basic knowledge & concept of Operational Amplifier & its Applications.
- Understanding of Principles and working of Timer ICs, Voltage regulator ICs.

Prerequisites:-
- Basic knowledge of Operational Amplifier & its Applications.
- Basic knowledge of Analog ICs.

Course Outlines:-

Sr. No.	Course Contents	Hours
1	**IC Fabrication:-** IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching, diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance, resistance and FETs.	8
2	**Characteristics of Op-Amp:-** Ideal OP-AMP characteristics, DC characteristics, AC characteristics, offset voltage and current: voltage series feedback and shunt feedback amplifiers, differential amplifier; frequency response of OP-AMP; Basic applications of op-amp – summer, differentiator and integrator.	9
3	**Applications of Op-Amp:-** Instrumentation amplifier, first and second order active filters, V/I & I/V converters, comparators, multivibrators, waveform generators, clippers, clampers, peak detector, S/H circuit, D/A converter (R-2R ladder and weighted resistor types), A/D converter - Dual slope, successive approximation and flash types.	9
4	**Special ICs:-** 555 Timer circuit – Functional block, characteristics & applications; 566-voltage controlled oscillator circuit; 565-phase lock loop circuit functioning and applications, Analog multiplier ICs	9
5	**Application ICs:-** IC voltage regulators - LM317, 723 regulators, switching regulator, MA 7840, LM 380 power amplifier, ICL 8038 function generator IC, isolation amplifiers, optocoupler, opto electronic ICs.	7

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Experiment List:-
- To Perform Inverting Amplifier using Op Amp.
- To Perform Non inverting Amplifier using Op Amp.
- To Perform Differential Amplifier using Op Amp.
- To Perform Integrator using Op Amp.
- To Perform Differentiator using Op Amp.
- To Perform Summing Amplifier using Op Amp.
- To Perform Astable Multivibrator using 555 IC.
- To Perform Monostable Multivibrator using 555 IC.
- To Perform Schmitt Trigger Circuits- using IC 741.
- To Perform Schmitt Trigger Circuits- using IC555.
- To Design Power Supply using Voltage Regulator ICs.

Learning Outcomes:-
- Definition & identification of various high power devices used in industry
- Knowledge of different Industrial dc/ac motor speed control
- Knowledge of different biomedical Instruments

Books Recommended:-
- Op-amps and Linear Integrated Circuits, **Ramakant A. Gayakward** ,IV edition, Pearson Education, 2003 / PHI. (2000)
- Linear Integrated Circuits,**D.Roy Choudhary, Sheil B.Jani,** II edition, New Age, 2003
- Integrated Electronics - Analog and Digital circuits system,**Jacob Millman, Christos C.Halkias**, Tata McGraw Hill, 2003.

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FACULTY OF: -Technology & Engineering (Diploma Engineering)
DEPARTMENT OF: -Electronics & Communication Engineering
SEMESTER: -___IV___ **CODE**: -2TE04PEA1
NAME – Power Electronics & its Applications (PEA)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total
							Theory				Practical (Marks)			
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
2TE04PEA1	Power Electronics & its Applications (PEA)	04	00	02	06	05	30	1.5	70	03	30	20	---	150

Objectives:-
- To developed the basic knowledge & concept of Industrial Electronics.
- Understanding of Principles and working of industry oriented components.

Prerequisites:-
- Basic knowledge of Electronics Device & Circuits.
- Basic knowledge of Electronics Networks.

Course Outlines:-

Sr. No.	Course Contents	Hours
1	**Control System :-** Introduction to automatic control system Open loop control systems Close loop control systems Basic elements of a servo mechanism. Example on automatic control system, Synchronous Servo-Motor, AC and DC Stepper motor	**08**
2	**Thyristors and their Applications:-** Introduction, applications, symbolic representations, specifications, thyristors ratings, Thyristor construction, Principle of operation of an SCR, Two transistor analogy of SCR, comparison between thyristors and transistors, methods of triggering a thyristor, commutation of a thyristor, DIAC, TRIAC, Unijunction transistor, Rectifier circuits using SCR, SCR as a static switch.	**10**
3	**Polyphase Rectifiers And Inverters :-** Advantages of polyphase Rectifiers, Types of polyphase Rectifiers- Three phase half wave and full wave, Three phase half wave with inter phase transformer using solid state devices, Principles of operation of controlled rectifiers, Parallel, series & Bridge Invertors, DC & AC Choppers, 1-phase and 3-phase cyclo-converters, UPS-Uninterrupted power supply.	**08**
4	**Solid state control of AC and DC motors :-** Introduction, Advantages of electronic control of Devices, D.C. motor speed control, Over voltage and Over load protection of DC motors, an AC motor speed control, Speed control of 1-phase induction motor, Speed control of Universal series motor.	**08**

5	**Timers And Automatic Controllers:-** Principles of R.C. timing circuit, R.C. timer using transistor and IC, SCR delay timer, Light Operated photo relay.	**06**
6	**Resistance Welding:-** Resistance welding, Digital weld control timer, Types of resistance welding, Electronics control in resistance welding, Heat control, Non-synchronous timer, Synchronous weld timer, Sequence timer, Energy-Storage Welding Systems.	**06**
7	**RF Heating:-** Induction Heating, Application of Induction Heating, High-frequency power source for induction heating, Dielectric Heating, Electrical Problems in Dielectric Heating, Electrodes used in Dielectric Heating, Thermal losses in Dielectric Heating, Power calculations, Application of dielectric heating, Resistance heating, Skin effect, depth of penetration, Calculation for heat control, Design of resistance heating elements, Power required for rapid heating, Application of resistance heating.	**10**

Experiment List:-

- To plot the V-I characteristics of a diode.
- To plot the characteristics curve of Uni-Junction transistor (UJT).
- To perform UJT as a relaxation oscillator.
- To plot the characteristics of SCR.
- To study of the forced commutation.
- To plot the characteristics of TRIAC.
- To study the phase control using TRIAC
- To perform position control using synchronous transmitter and receiver.
- To demonstrate the operation of the photo electric relay
- To study the timer circuits using IC 555.
- To study invertors circuit.

Learning Outcomes:-

- Definition & identification of various high power devices used in industry
- Knowledge of different Industrial dc/ac motor speed control
- Knowledge of different biomedical Instruments

Books Recommended:-

- Industrial Electronics & control, **S. K. Bhattacharya and S. Chatterjee**, TTTI, Chandigarh
- Industrial and Power Electronics, **Harish. C. Rai,** Umesh Publication
- Power Electronics, **M.H. Rashid,** Pearson
- Bio-medical Instrumentation and Measurements, **Leslie Cromwell,** PHI

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FACULTY OF: -Technology & Engineering (Diploma Engineering)
DEPARTMENT OF: -Electronics & Communication Engineering
SEMESTER: -__IV__   **CODE**: -2TE04DCM1
NAME – Digital Communication (DCM)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total
							Theory				Practical (Marks)			
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
2TE04DCM1	Digital Communication (DCM)	04	00	02	06	05	30	1.5	70	03	30	20	---	150

Objectives:-

- To developed the basic knowledge & concept of Digital Communication Systems. Understanding of working principle of Different types of Pulse Modulation and Demodulation Techniques & the advantages of Digital Modulation and Demodulation Techniques.

Prerequisites:-

- Basicconcept of Digital Communication Systems..

Course Outlines:-

Sr. No.	Course Contents	Hours
1	**Pulse Modulation Techniques :-** Sampling Process : Statement of sampling theorem, Nyquist rate, Nyquist interval, effect of under sampling (Aliasing), Sampling techniques : Instantaneous sampling and waveforms, Natural sampling, Flat-top sampling, Comparison of the sampling techniques, Pulse modulation Technique : Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation, Comparison of PAM, PWM and PPM, Time Division Multiplexing	**12**
2	**Source Coding :-** Discretization in amplitude (quantization process): Basics of quantization, step-size, resolution, quantization noise, uniform and non - uniform quantizer, companding, Pulse Code Modulation (PCM), Delta modulation (DM), Differential PCM (DPCM), Comparison of PCM, DM, ADM and DPCM, Channel coding techniques: RZ, NRZ, Bipolar, Manchester, Differential Manchester	**12**
3	**Digital Multiplexing :-** Digital multiplexing: Principle, advantages, 4-level multiplexing hierarchy, multiplexing of different types of signals, PCM-TDM system: Block diagram and operation, Frame structure and synchronization, Bit rate and bandwidth, Channel associated signalling.	**12**
4	**Digital Modulation :-** Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying: Binary PSK, QPSK, 8-PSK, Quadrature Amplitude Modulation (QAM).	**10**

5	**Data Communication:-** Introduction, Data communications hardware, Asynchronous serial data communication, Serial data transmission standards: RS232, RS422A, Synchronous serial data communication protocols: BISYNC, SDLC, Data communication modems, Block diagram of an asynchronous FSK Modem, Bluetooth communication technique.	**10**

Experiment List:-
- To study and perform Pulse Amplitude Modulation and Demodulation and Draw output waveforms.
- To study and perform Pulse Position Modulation and Demodulation and Draw output waveforms.
- To study and perform Pulse Width Modulation and Demodulation and Draw output waveforms.
- To study and perform PCM-TDM System
- To study and perform Amplitude Shift Keying Modulation.
- To study and perform Amplitude Shift Keying Demodulation.
- To study and perform Frequency Shift Keying Modulation.
- To study and perform Frequency Shift Keying Demodulation.
- To study of different types of MODEMS.

Learning Outcomes:-
- Definition & identification of various Digital Communication Terms.
- Knowledge of different types of Pulse Modulation and Demodulation Techniques.
- Knowledge of different types of Digital Modulation and Demodulation Techniques.
- Knowledge of Data Communication Techniques.

Books Recommended:-
- Electronic Communication systems, **George Kennedy**, MGH
- Electronic Communications, **Dennis Roddy-John Coolen**– Pearson
- Electronics Communication, **Sanjeev Gupta** - Khanna

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FACULTY OF: -Technology & Engineering (Diploma Engineering)
DEPARTMENT OF: -Electronics & Communication Engineering
SEMESTER: -IV   **CODE**: -2TE04MPI1
NAME – Microprocessor and Interfacing (MPI)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total
							Theory				Practical (Marks)			
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
2TE04MPI1	Microprocessor And Interfacing (MPI)	04	00	02	06	05	30	1.5	70	03	30	20	---	150

Objectives:-
- This course provides information about the basic architecture, instructions and interfacing of 8085 microprocessor.

Prerequisites:-
- Basic concepts of digital logic design and number system

Course Outlines:-

Sr. No.	Course Contents	Hours
1	**Basic microprocessor architecture :-** 8085 Microprocessor Architecture and its operation, 8085 BUS organization, Internal data operations and 8085 registers, Memory read and write operation, 8085 Microprocessor: Block diagram, Address and data bus, control and status signals, Power-supply and clock frequency, Interrupts and externally initiated operations, serial I/O ports, BUS timings, Flags.	**10**
2	**8085 instruction and timing :-** Classification of instruction, Instruction Formats: Single bytes, Two bytes and Three bytes instructions, Opcode format, Instruction Timings and operation status, simple programs.	**10**
3	**8085 instruction set :-** Data transfer instructions, Programs using data transfer Instructions, Arithmetic Instructions, Programs using arithmetic Instructions, Logical operations, Programs using logical Instructions, Branch operations, Programs using branch Instructions, Stack, I/O and Machine control Instructions, Programs using push-pop Instructions	**10**
4	**8085 Programming :-** Program related to Looping, Counting and Indexing, Logical programs, Program related to Counter and Timing delays, Program related toCode conversion, BCD Arithmetic and 16 Bit data operations	14
5	**Interfacing With 8085 :-** Interfacing Concepts, Ports, Interfacing Of I/O Devices, Interrupts In 8085, Interfacing of Data Converters (D-To-A And A-To-D), Programmable Interfacing Devices Like 8279,	**12**

Keyboard/Display Interface, 8255A PPI, Serial I/O Concepts, SID And SOD, 8251A USART. Interfacing of above chips With 8085.	

Experiment List:-
- Study the architecture of microprocessor.
- Study the architecture of 8085 a microprocessor.
- Program related to data transfer instruction.
- Program related to arithmetic instruction.
- Program related to logical instruction.
- Program related to branching instruction.
- Program related to looping ,counting and indexing
- Study the 8085-trainer kit
- Programs on 8085-trainer kit

Learning Outcomes:-
- Student can acquire the basic Knowledge of 8085 Microprocessor.
- Students will be able to know about basic architecture of 8085 microprocessors and instruction of microprocessor and they are able to do programming of 8085.

Books Recommended:-
- Microprocessor Architecture, Programming, and Applications with the 8085, **Ramesh S. Gaonkar ,** Penram International.
- Microcomputers and Microprocessors: The 8080,8085 and Z-80 Programming,Interfacing and Troubleshooting,**John E. Uffenbeck**.
- Microprocessor and Microcontroller fundamentals. The 8085 and 8051 Hardware and Software,**William Kleitz.**

FACULTY OF: -Technology & Engineering (Diploma Engineering)
DEPARTMENT OF: -Electronics & Communication Engineering
SEMESTER: -IV__   **CODE**: -2TE04AVS1
NAME – Audio Video Systems (AVS)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total
							Theory				Practical (Marks)			
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
2TE04AVS1	Audio Video Systems (AVS)	03	00	02	05	04	30	1.5	70	03	30	20	---	150

Objectives:-
- This course provides information about the basic introduction of Electro Acoustic Transducers like Microphones & Loud Speakers. The students will learn the concepts of Electro Acoustic Transducers. They also learn different Applications of Microphones & Loud Speakers. The content of the course includes various basic concepts of Video System like TV also.

Prerequisites:-
- Basic concepts of Audio & Television System.

Course Outlines:-

Sr. No.	Course Contents	Hours
1	**Audio System:-** Microphones:construction, working principles and applications of microphones, their types viz: a) Carbon b) moving coil, c) velocity, d) crystal, e) condenser, e) cordless etc, Loud Speaker: Direct radiating, horn loaded woofer, tweeter, mid range, multi-speaker system, baffles and enclosures, Sound recording on magnetic tape & disc, Hi-Fi system, pre-amplifier, amplifier and equalizer system, stereo amplifiers	**10**
2	**Television:-** Elements of TV communication system, Scanning, Progressive scanning, interlaced scanning, resolution and band width requirement, tonal gradation, Composite Video signal (CVS) at the end of even and odd fields. equalizing pulses and their need, Monochrome picture tube, comparison of magnetic and electric deflection of beam, camera tube: vidicon and plumbicon, Block diagram of TV camera and the transmitter chain, Block diagram of a TV receiver, Major specification of the CCIR, Concept of positive and negative modulation VSB Transmission Turner: Typical circuits of scanning and EHT stages of TV receiver, keyed AGC, function and location of brightness contrast V-hold, H-hold of centering control, Identification of faulty stage by analyzing the symptoms and basic idea of a few important faults and there remedies, Colour Schemes: Introduction to PAL, NTSC, SECAM systems, advertisement and disadvantages block diagram of video camera and its explanation, Construction and working principles of	**10**

	trinitran and PIL types of colour picture tubes, Concept of convergence, purity of beam shifting, Block diagram of PAL TV receiver	
3	**Colour TV:-** Primary colours, tristimulus values, trichromatic coefficients, concepts of additive and subtracting mixing of colours, concepts of luminance, Hue and Saturation, Representation of a colour in colour triangle, non spectral colour, visibility curve, Compatibility of colour TV system with monochrome system, Block diagram of colour TV camera, Concepts of trinitron and PIL types of colour picture tubes, PAL TV receiver	**10**
4	**Cable Television:-** Block diagram and principles of working of cable TV, Block diagram and principles of working of DTH, Block diagram and principles of working of cable TV using internet.	**09**
5	**VCR, VCD and DVD:**- Principle of video recording on magnetic tapes, Block diagram of VCR, VHS tape transport mechanism, Study of VCD and DVD	**06**

Experiment List:-
- To plot the frequency response of a microphones.
- To plot the frequency response of a loud speakers.
- Demonstration of a tape-transport mechanism.
- Trouble shooting of tape-recorder system.
- To observe the wave forms and voltage B/W and colour T.V receiver.
- Fault finding of colour T.V.
- Trouble shooting of C.D. Player.
- Demonstration of DVD Player.
- Demonstration and study to VCD especially its transport mechanism.
- Study of a TV cable network system through internet.

Learning Outcomes:-
- Student can acquire the basic Knowledge of Audio Devices & TV.
- Students will be able to know about microphones, Loud Speakers, TV, VCD, DVD, etc Devices which will helpful for Understanding of new applications and techniques for Audio & Video System.

Books Recommended:-
- Colour Television-principles & practice, **R.R Gulati**, Wiley Eastern Limited, New Delhi
- Complete Satellite & cable Television, **R.R Gulati**, New age International Publisher
- Colour Television Servicing, **RC Vijay,** BPB Publication, New Delhi
- Colour Television & Video Technology, **A.K. Maini**, CSB Publishers
- VCR-principles, maintenance & repair, **S.P. Sharma**, Tata Mc Graw Hill, New Delhi
- Colour TV, **A. Dhake**

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FACULTY OF: -Technology & Engineering (Diploma Engineering)
DEPARTMENT OF: -Electronics & Communication Engineering
SEMESTER: -IV__   **CODE**: -2TE04PDT1
NAME – PCB Designing Tools (PDT)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total
							Theory				Practical (Marks)			
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
2TE04PDT1	**PCB Designing Tools (PDT)**	00	00	02	02	01	---	---	---	---	50	50	---	100

Objectives:-

- In the era of miniature electronic gadgets and automation, it is required to have electronic circuit simulation for better design and cost effective PCB layout for better performance. This course aims to teach students about how to simulate the electronic circuit and how to design PCB layout of given circuit using available circuit simulation and PCB layout design tools (free or licensed). This course helps the student to simulate the circuit and develop complete hardware circuit on PCB.

Prerequisites: -

- Simulate/test the electronic circuit using circuit Simulation Tools.
- Fabricate PCB layout of electronic circuits by using PCB layout design tools

Course Outlines:-

Sr. No.	Course Contents	Hours
1	**Circuit Simulation and PCB Design Software:-** Circuit simulation software, PCB layout design software.	**8**
2	**Design of Schematic Electronic Circuits Using Software :-** Wire, bus, junction, probe, voltage source, current source, and ground etc. used in circuit simulation software , Create new project, and schematic file, Search, add and create new electronic part, Edit, Connect or wire the circuit.	**10**
3	**Simulation of Electronic Circuits :-** Test RC, LC or RLC based electronic circuit , Test diode, transistor or MOSFET based electronic circuit, Test analog/digital IC based electronic circuit, Transient analysis of RC, LC, or RLC based electronic circuit, Bias point analysis or characteristic curve of diode, transistor or MOSFET based electronic circuit, Transient analysis of diode, transistor or MOSFET etc. based electronic circuit, Frequency response (AC Analysis) of RC, diode, and transistor etc. based electronic circuit, Frequency response (AC Analysis) analog/ digital IC based electronic circuit	**10**
4	**PCB Layout Design:-** Net list file, back annotation, bill of material, foot print, PTH, track width, mil, etc. transfer circuit to PCB layout, Search, add and create footprint, Place, route and generate	**8**

	PCB Layout	
5	**PCB Fabrication Techniques :-** Drawing and printing layout on board, photo etching process, masking process, etc, PCB manufacturing techniques	**6**

Experiment List:-

- Evaluate different Circuit simulation tools for Circuit Simulation (Presentation)
- List and compare different PCB layout design tools used for PCB Layout Design (Presentation)
- Create and save new schematic file with Project using circuit simulation software.
- Use different options like wire, Bus, junction, AC and DC voltage source, current source, probe, Pulse generator, ground, probe etc. of circuit simulation software library.
- Search, create and add the electronic component to the schematic file from the library used in circuit simulation software.
- Connect the electronic circuit using Place and route method used in circuit simulation software.
- Connect, simulate and test the RC, LC, and RLC based electronic circuit using circuit simulation software.
- Connect, simulate and test the Diode, Transistor, MOSFET based electronic circuit using circuit simulation software.
- Connect, simulate and test IC based electronic circuit using circuit simulation software.
- Calculate the Bias point and verify V- I characteristic (DC Analysis) curve of given diode or transistor based circuitry using circuit simulation software.
- Draw the Transient analysis curve of a given diode circuit using circuit simulation software.
- Draw the Transient analysis curve of a given transistorized electronic using circuit simulation software.
- Draw the Transient analysis curve of a given Analog IC based electronic circuit using circuit simulation software.
- Draw the Frequency response (AC Analysis) curve to check the functionality of RC, LC and RLC based circuit using circuit simulation software.
- Draw the Frequency response (AC Analysis) curve to check the functionality of Transistorized based circuit using circuit simulation software.
- Draw the Frequency response (AC Analysis) curve to check the functionality of analog IC based circuit using circuit simulation software.
- Use the following options netlist file, back annotation , Bill of material, single layer PCB, double layer PCB, PTH, footprint, track width, mil, etc. and develop a complete project.
- Synthesize and Transfer an electronic circuit using circuit simulation software to the PCB layout design software.
- Search, create and add footprint of different electronic components to the PCB layout design file .
- Synthesize the PCB Layout of the given RC, RLC, diode or transistor based electronic circuit with manual and auto routing technique using PCB design software.
- Synthesize the PCB Layout of given analog or digital IC based electronic circuit with manual and auto routing technique using PCB design software.
- Synthesize complete PCB for a given electronic circuit (mini project)
- Synthesize complete PCB through following Fabrication Techniques step by step.

Learning Outcomes:-

- The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.
- Compare different circuit simulation and PCB layout design software.
- Make schematic electronic circuits in the software
- Simulate simple electronics in the software
- Design and develop layout of PCB using PCB layout design tool with fabrication (free or licensed).

Books Recommended:-

- Printed Circuit Boards: Design and Technology , **Bossart** , TMH, New Delhi 2008 or latest edition
- Multisim user manual , **National Instruments**, www.ni.com
- Ultiboard user manual , **National Instruments**, www.ni.com