MVN UNIVERSITY

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

SCHEME & SYLLABUS

4^{th} SEM

Integrated B. Tech.

6 year regular degree course: Integrated B Tech(ECE) with exit option after 3 years with a Diploma in Engineering

Semester:IV

S. No	Course Title	Paper Code	Teaching Schedule			Total	Credit
			L	T	P		
1	Electronic Measurement & Instrumentation	ECL032	3	1	2	6	5
2	Analog Integrated Circuits	ECL034	3	1	2	6	5
3	Audio Video System	ECL036	3	1	2	6	5
4	Signals and Systems	ECL038	3	1	0	4	4
5	Computer Architecture & Organization	CSL036	3	1	0	4	4
6	Electronic Workshop	ECP042	0	0	2	2	1
7	Language Communication - IV	AHP 032	1	0	2	3	NC
8	Basics Of EVS	AHL 034	2	0	0	2	2
	Total		18	5	10	33	26

CL 032	ELECTRONIC MEASUREMENT & INSTRUMENTATION	L	T	P	Cr
		3	1	2	5

Objective: The objective of the course is to provide fundamental knowledge of measuring devices and circuits. It covers basic principle of operations and usefulness of some of the electronic measuring instruments that help us in measuring and trouble shooting of electronic circuits.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Basics of Measurements

Measurement, method of measurement, types of instruments, Specifications of instruments: Accuracy, precision, sensitivity, resolution, range, errors in measurement, sources of errors, limiting errors loading effect, requirements, importance and applications of standards, calibration

UNIT 2: Multimeter

Principles of measurement of DC voltage, DC current, AC voltage, AC current, moving coil and moving iron type instruments (voltmeter and Ammeter), Block diagram of multimeter and measurement of voltage, current and resistance using multimeter, Specifications of multimeter and their applications, Limitations with regard to frequency and input impedance.

UNIT 3: Electronic Voltmeter

Advantages over conventional multimeter for volt measurement with respect to input impedance and sensitivity, Principles of voltage, current and resistance measurement (block diagram only)

Specifications of electronics voltmeter, Types of AC milli voltmeters and their block diagram description, Typical specifications and their significance.

SECTION – B

UNIT 4: Cathode Ray Oscilloscope (CRO)

Construction and working of different blocks used in CRT, Time base operation and need for blanking during flyback, synchronization, Block diagram description of a basic CRO and triggered sweep oscilloscope, front panel controls, Specifications of CRO and their explanation

Measurement of current, voltage, frequency, time period and phase using CRO, CRO probes, special features of dual beam, dual trace,delay sweep, Digital storage oscilloscope: block diagram and working principle

UNIT 5: Impedance Bridges and Q Meters

Wheat stone bridge, AC bridges: Maxwell's induction bridge, Hay's bridge, De-Sauty's bridge,

Schering bridge and Anderson bridge, Block diagram description of laboratory type RLC bridge, specifications of RLC bridge, Block diagram and working principle of Q meter

UNIT 6: Digital Instruments

Comparison of analog and digital instruments, Working principle of ramp, dual slope and integration type digital voltmeter, Block diagram and working of a digital multimeter, Measurement of time interval, time period and frequency using universal, counter/frequency counter, Working principle of logic probe, logic pulser, logic analyzer, logic comparator, signature analyzer and logic analyzer

Text Books:

1. A.K. Sawhney, "Electronics Measurement and Instrumentation" Dhanpat Rai & Sons, Delhi

Reference Books:

1. Electronics Instrumentation by Cooper, Prentice Hall of India
2. Electronics Test and Instrumentation by Rajiv Sapra, Ishan Publications, Ambala
3. Electronics Instrumentation by JB Gupta, Satya Prakashan, New Delhi

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

List of Experiments:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance
2. To observe the limitations of a multimeter for measuring high frequency voltage
3. Measurement of voltage, frequency, time period and phase using CRO
4. Measurement of rise time and fall time using CRO
5. Measurement of Q of a coil and its dependence on frequency
6. Measurement of voltage, frequency, time and phase using DSO
7. Measurement of resistance and inductance of coil using RLC meter
8. Measurement of distortion of RF signal generator using distortion factor meter
   Use of logic pulser and logic probe
9. Measurement of time period, frequency, average period using universal counter/ frequency
   counter
10. Study of operation and features of a logic analyser

ECL 034	ANALOG INTEGRATED CIRCUITS	L	T	P	Cr
		3	1	2	5

Objective: The objective of the course is to provide fundamental knowledge of electronic components, devices and circuits. It covers basic principle of operations and usefulness of some of the electronic measuring instruments that help us in trouble shooting of electronic circuits. It is also helpful to design electronic circuits using Operational amplifier.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Field effect Transistors

Construction, operation and characteristics of FET and its - Construction, operation and characteristics of MOSFET Comparison of JFET, MOSFET and BJT. FET amplifier circuit and its working principle.

UNIT 2: Operational Amplifiers

Ideal and practical operational amplifiers, characteristics of op amp,inverting and non-inverting amplifier, differential amplifier, offset error : voltage and current, slew rate,common mode rejection ratio (CMRR) .

UNIT 3: Op-Amp Circuit Applications

Current to voltage converters, V to I converters, current amplifier, difference Amplifiers, Instrumentation Amplifiers, integrators and differentiators

SECTION – B

UNIT 4: Non- Linear Amplifiers

Comparators, sample & hold circuits, Logarithmic amplifier, anti-log amplifier, logarithmic multiplier, waveform generators , Miller & Bootstrap sweep generators, regenerative comparator (Schmitt Trigger), multivibrators, ADC.

UNIT 5: Wavefor Generator

Square wave generators: 555 Timer, Ramp Generator: Triangle generator, Sawtooth generator, Function Generators: Multi op-amp function generators, IC function generators

UNIT 6: Oscillators

Crystal controlled Oscillator, Wien-bridge, R-C Phase Shift and twin-T oscillators and their applications.

Text Books:

1. N.N. Bhargava, "Basic Electronics and Linear Circuits", Tata McGraw Hills, New Delhi
2. V.K. Mehta, "Principles of Electronics", S. Chand & Company Ltd, 2000.

Reference Books:

1. Millman and Halkias, "Electronic Devices and Circuits", McGraw Hills, New Delhi.
2. Donald Schilling & Charles Belove, "Electronics Circuits Discrete and Integrated", Third edition, McGraw Hill International edition, 1989.
3. Sedra and Smith, "Microelectronic Circuits", Oxford University press, 5th Edition, 2005.
4. J. Michael Jacob, "Applications and design with Analog Integrated Circuits", PHI, 2nd Edition, 2004..

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

List of Experiments:

1. Plot the transfer characteristics of MOSFET .
2. Plot the transfer characteristics of JFET .
3. Realize Inverting and Non-Inverting Amplifier using Op-AMP(IC-741).
4. Realize Adder and subtractor circuits using Op-AMP(IC-741).
5. Realize Integrator Circuit using Op-AMP(IC-741)
6. Realize Differentiator circuit using Op-AMP(IC-741).
7. Study the functioning of Function generator
8. Realize working of saw tooth generator.
9. Realize working of Wein- Bridge Oscillator
10. Realize working of RC Phase Shift Oscillator

ECL 036	AUDIO VIDEO SYSTEM	L	T	P	Cr
		3	1	2	5

Objective: To understand the basic concepts of audio and video systems that will be helpful for the students to design and troubleshoot these systems. The basic idea is to provide the sound knowledge of today's communication systems to the students.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Introduction to Audio Systems

Properties of sound, Hi-Fi and stereo systems, disc recording and reproduction. magnetic recording and reproduction, optical recording. Working of CD player, MP3 player, DVD player.

UNIT 2: TV Picture & Composite Video Signal

Picture elements. Horizontal and vertical scanning, frame and field frequencies, Horizontal and vertical synchronisation, Horizontal and vertical blanking. T.V. Channel standards.

UNIT 3: Composite Video Signal

Construction of composite Video signal, Horizontal blanking time and vertical blanking time. Linear scanning, standard scanning pattern. Flicker, sync Pulses, blanking signals.

SECTION – B

UNIT 4: Monochrome Television

T.V. Camera tubes, image orthicon, silicon diode array camera tube. Block diagram of TV receiver, constructional features of deflection yoke,

UNIT 5: Colour Television

Fundamental concepts of 3 colours systems. Additive and subtractive mixing of colours, different Colour systems like NTSC, PAL, and SECAM. Colour TV Transmitter block diagram. Colour TV receiver block diagram (PAL). Colour video signal processing, operating and service controls, colour picture tube, degaussing.

UNIT 6: Satellite and Cable TV

Cable TV, DTH system, DTH receiver, HD TV, Remote Control.

Text Books:

1. Audio and Video system by R.G. Gupta TMH
2. Audio and Video systems by Ajay Sharma, Dhanpat Ray & sons

Reference Books:

1. Colour Television by R.R.Gulati. TMH
2. Communication Electronics by Frenzel TMH
3. Television Engineering by Dhake.
4. Satellite TC and Cable TV system by R.R.Gulati TMH

5. Multimedia Sound & Video by Jose‟Lozans. PHI
6. Basic Radio And Television Sharma TMH.

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

List of Experiments:

1. To study working knowledge of CD Player.
2. To study working knowledge of MP 3 Player.
3. To study working knowledge of DVD Player.
4. To study the working of Monochrome TV Picture Tube.
5. To study the troubleshooting of Monochrome TV Picture Tube.
6. To study the working of Color TV Picture Tube.
7. To study the troubleshooting of Color TV Picture Tube.
8. To study the functioning of Satellite TV.
9. To study the functioning of Cable TV.
10. To study the function of Remote Control.

ECL 038	SIGNALS AND SYSTEMS	L	T	P	Cr
		3	1	0	4

Objective: The objective of the course is to introduce the various types of signals and their behavior. After the study of this course, the students will be able to understand signal and their effect on various types of systems.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Signals

Definition, types of signals and their representations: continuous-time and discrete-time, periodic and non-periodic, even and odd, energy and power, deterministic and random, one-dimensional and multi-dimensional.

UNIT 2: Commonly used signals Unit impulse, unit step, unit ramp, exponential, rectangular pulse, sinusoidal.

UNIT 3: Fourier Transforms (FT)

Definition, conditions of existence of FT, properties

SECTION – B

UNIT 4: Laplace-Transform (LT)

One-sided LT of some common signals, important theorems and properties of LT

UNIT 5: Inverse Laplace-Transform (ILT)

Inverse Laplace Transform, Regions of convergence (ROC)

UNIT 6: Introduction to Communication Systems

Introduction to Communication, Communication System, Analog Communication System, Digital Communication System, Analog Versus Digital Communication, Fundamental limitations of Communication System

Text Books:

1. I J Nagrath, R. Ranjan & Sharan, "Signal and Systems", 2009 Edn., TMH, New Delhi
2. P. Ramesh Babu, R. Anandanatarajan, "Signal and Systems", Fourth Edition, Scitech Publications

Reference Books:

1. V. Oppenheim, A.S. Willsky and S. Hamid Nawab, "Signals & System", PEARSON Education, Second edition, 2003.
2. HSU & Ranjan, "Schaume Series on Signals & Systems", TMH, India

CSL 036	COMPUETR ARCHITECTURE & ORGANIZATION	L	T	P	Cr
		3	1	0	4

Objective: This subject focuses on better understanding and deeper knowledge of the basic computer architecture and organization, it emphasizes on the basic circuits and techniques used in CPU, memory, and input/output communication to/from computer.

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1:
Review of Basic Computer Architecture and Microprocessors; Von Neumann architecture: principles, instruction sets, instruction format, addressing modes.

UNIT 2:
CISC versus RISC architectures, Storage system and their technology: memory hierarchy, main memory organization and operations, cycle time, bandwidth and interleaving; cache memory: addressing mapping, block size, replacement and store policy.

UNIT 3:
virtual memory: page table , TLB; I/O fundamentals: handshaking, buffering, programmed I/O, interrupts-driven I/O; Buses: types, bus protocols, arbitration,

SECTION – B

UNIT 4:
Direct Memory Access, Pipelining: principles, Instruction pipelines, Pipelines difficulties and solutions, Introduction to SIMD, MIMD.

UNIT 5:
subroutine call and return mechanism; Control unit: hardwired, micro-programmed, micro instruction mapping, micro program sequencer.

UNIT 6:
Architecture of 8086, Instruction set of 8086, Assembly/machine language programming (8086).

Text Books:

1. Morris Mano, “Computer System Architecture”, Prentice Hall, 2007.

Reference Books:

2. Patterson, D. A. and Hennessy, J. L., "Computer Organization and Design: The Hardware/ Software Interface", 2nd Edition, Morgan Kaufmann 1998.
3. William Stallings, "Computer Architecture & Organization: Design for Performance", Prentice Hall, 2000.
4. J. Van de Goor, "Computer Architecture and Design", 1989
5. John P Hayes, "Computer Architecture and Organization", Prentice Hall
6. David A Patterson, "Computer Architecture A Quantitative Approach", Pearson Education Asia

ECP 042	ELECTRONIC WORKSHOP	L	T	P	Cr
		0	0	2	1

LAB:

Note: At least ten experiments are to be performed during the semester. At least eight experiments should be performed from the list of experiments. Two experiments may either be performed from the given list of experiments or may be designed by the concern faculty in consultation with H.O.D as per the scope of syllabus.

List of Experiments: (Experiments to be performed using Simulation Software)

1. To study, Identification & testing of passive Components, Resistor Compactor.
2. Draw the V-I characteristics of P-N Junction Diode in forward and reverse Bias.
   - **i) S**ilicon
   - **ii)** Germanium
3. Draw the input and output wave form of Half wave rectifier using semi conductor diode.
4. Draw the input and output wave form of full wave rectifier using semi conductor diode.
5. Draw input and output characteristics of Transistor in common base configuration.
6. Draw the V-I characteristics of zener diode.
7. Design of unregulated power supply using half wave rectifier
8. Design of unregulated power supply using Full wave rectifier
9. Design of regulated power supply using Shunt regulator
10. Design of regulated power supply using series regulator
11. Study and design a D.C amplifier
12. Study and design an A.C amplifier

AHP032	LANGUAGE COMMUNICATION-IV	L	T	P	Cr
		1	0	2	0

Objective: As the importance of English is budding with each day as a global language for professionals. Therefore, this course has been designed by keeping in mind its importance.

UNIT-1: Phonetics

- Phonetic Transcription of Words-IV
- Words Commonly Mispronounced- IV
- Word Stress-II

UNIT-2: Reading Practice

- Reading newspaper articles
- Reading story books
- Reading magazines

UNIT-3: Oral Practice

- Group Discussion
- Debate
- Role Plays and Simulations
- Mock Interview
- Classroom Presentations

UNIT-4: Study Skills

- Commonly Misspell Words-IV
- Dictation
- Looking up a dictionary
- Learning pronunciation from a dictionary (Practical implementation of IPA symbols)
- Learning classification and context of words from the dictionary
- Crosswords

AHL 034	BASICS OF ENVIRONMENTAL STUDIES	L	T	P	Cr
		2	0	0	2

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: The Multidisciplinary Nature of Environmental studies

Definition of environment; multidisciplinary nature of environmental studies; need for public awareness; concept of ecomark.

UNIT 2: Ecosystems

Concept; ecosystem characteristics (structure and functions of ecosystem: food chains, food webs and ecological pyramids); primary production; ecosystem regulation; some types of ecosystem-forest ecosystem, grassland ecosystem.

UNIT 3: Natural resources

Renewable and non-renewable resources, natural resources and associated problems:

a) Forest resource: Use and over-exploitation, deforestation.

b) **Food resources**: World food problems, changes caused by agriculture and over-grazing, fertilizer-pesticide problem, water logging.

c) Land resources: Land as a resource, land degradation, soil erosion and desertification, water logging.

SECTION – B

UNIT 4: Environmental Pollution

Definition, cause, effects and control measures of different types of pollutions-air pollution; water pollution; soil pollution; thermal pollution, solid waste management- causes; role of an individual in prevention of pollution.

UNIT 5: Social issues and environment

Urban problems related to energy; water conservation; rain water harvesting; global warming, acid rain; ozone layer depletion, waste-land reclamation.

UNIT 6: Environmental legislation

Air (prevention and control of pollution) Act; water (prevention and control of pollution) Act; Forest conservation Act; public awareness.

Text Books:

1. Kaushik Anubha, C.P. Kaushik, “Perspective in Environmental Studies”, New Age.International (P) Ltd. Publishers
2. Joseph Benny, “Environmental Studies”, Tata McGraw Hill Publishing Company Ltd., New Delhi

Reference Books:

1. Ubaroi, N.K., "Environment Management", Excel Books, New Delhi
2. Rajagopalan R, "Environmental Studies", Oxford University Press, New Delhi