MVN UNIVERSITY

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

SCHEME & SYLLABUS

4th SEM

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

<table>
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<tr>
<th>S. No</th>
<th>Course Title</th>
<th>Paper Code</th>
<th>Teaching Schedule</th>
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<td>Electronic Measurement &amp; Instrumentation</td>
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<td>2</td>
<td>Analog Integrated Circuits</td>
<td>ECL034</td>
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<td>Audio Video System</td>
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<td>Signals and Systems</td>
<td>ECL038</td>
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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:

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
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: Waveform 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:**

**Reference Books:**

**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
5. Realize Integrator 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
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.
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

Text Books:

Reference Books:
2. HSU & Ranjan, “Schaume Series on Signals & Systems”, TMH, India
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:
Reference Books:
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) Silicon
   ii) Germanium
3. Draw the input and output wave form of Half wave rectifier using semiconductor diode.
4. Draw the input and output wave form of full wave rectifier using semiconductor 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
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
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:
Reference Books: