

University of Kashmir

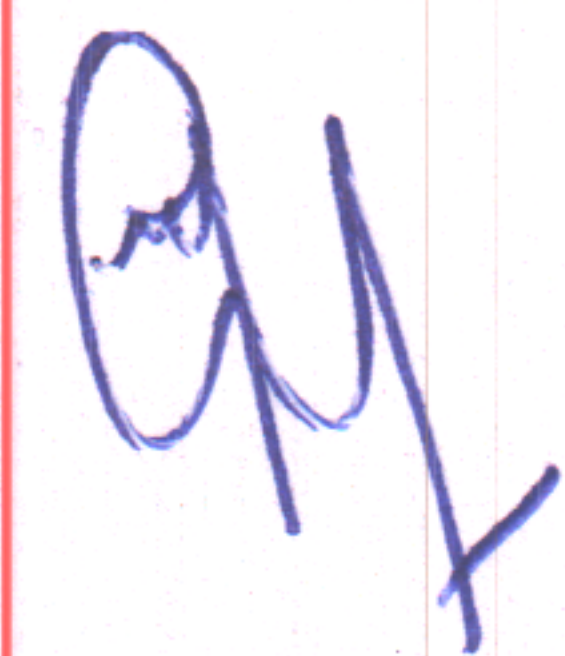
Course Title: **Electronics Equipment and Maintenance**

Semester-I

Course Code: EEM-DSC 1A

Paper-I: Principles of Electronics-I

Unit I:	Introduction to components and Semiconductor diodes Introduction to Passive Components (Resistor, Capacitor, Inductor), Transformer, Relay, Fuses, Switches and Cable Connectors, Transducers (LDR, Thermistor, Photodiode, IR diode, LVDT), PCB design Conductor, semi-conductor, Insulator, Intrinsic and Extrinsic Semi-Conductors (P, N type) Diffused junctions, Depletion layer, Barrier Potential, Energy Band diagram. Junction Diodes: Rectifying Diodes, Forward and Reverse Bias Characteristics, Switching diode, Varactor diode, Photo diode, Light emitting diode, IR sources and Detectors, Optical Isolators, Zener diode.
Unit II:	Semiconductor devices Bipolar Junction Transistors: CB, CE, CC Configurations, Operating point, Biasing circuits, Bias Stability, Thermal runaway and thermal stability. Field Effect Transistors: FET & MOSFET, characteristics, biasing and small signal low frequency analysis of CD, CS and CG configurations Amplifiers: Different terms used in Amplifiers (Signal, Source, Input Output voltage, Current Gain, Power Gain, Decibel, Input and Output Impedances), Classifications according to Frequency response, RC coupled common emitter amplifier
Unit III:	Amplifiers and Transistor Power amplifiers: Transistor Power Amplifier: Circuits and operations of class-A, Class-B and Class-C amplifiers, Push-Pull amplifiers Unijunction Transistor: Basic working principle (Qualitative), Characteristics, Applications as switch. Power control Devices: Four layer diode (PNPN), Silicon Controlled Rectifier (SCR), Triacs, Diacs, Principles and Characteristics.
Unit IV	Feedback in Amplifiers and Oscillators: Concept of negative feedback, Voltage series, Voltage shunt, Current series and Current shunt feedbacks Oscillators: Concept of positive feedback, Barkhausen criterion, RC Phase shift oscillator, Hartley, Colpitt and Crystal oscillators. Power Supplies Regulated Power Supply, Zener Regulated power supply, Series and shunt Regulated power Supply, Block diagram of IC 723 Regulated Power Supply, Three terminal Ics Power Supply, Study of Power Supply w.r.to variation in Load and Line voltages, Switch mode Power Supply, Design principles and applications.



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References:

1. A.P. Malvino, Electronic Principles, Tata McGraw Hill Pub. Company (Third Edition)
2. Millman & Halkias, Integrated Electronics, McGraw Hill.
3. Mitchel E. Schultz, Grob's Basic Electronics, 10th Edn. Tata McGraw Hill
4. R. L. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, Pearson Education.
5. B. L. Theraja, A Text Book of Electrical Technology, Volume I, Nirja Construction and Development Co

EEM LAB: DSC 1A LAB: Principles of Electronics-I LAB 60 Lectures

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

Practical

1. Study of Electronic components and analog multimeter.
2. Verification of KVL and KCL.
3. Study of CRO and determination of amplitude, frequency and time period of observed voltage waveform.
4. Verification of Superposition Theorem.
5. Verification of Thevenin's theorem.
6. Verification of Norton's theorem.
7. Study of Maximum power transfer theorem and determination of internal resistance of a source.
8. Study of P-N junction diode characteristics and determination of bulk resistance.
9. Study of zener diode characteristics and determination of breakdown voltage.
10. Study the Applications of diode as, clippers and Clampers,.
11. Study of Common-Emitter transistor characteristics and determination of β_{dc} .
12. Study of series resonance circuit and determination of its bandwidth and Q factor.
13. Study of Half wave rectifier and determination of ripple factor and efficiency (η)
14. Study of Full wave rectifier and determination of ripple factor and efficiency (η).
15. Study of Zener shunt regulator, line and load regulation characteristics.
16. Study the I-V characters of JFET & MOSFET.

