

**SREENIVASA INSTITUTE of TECHNOLOGY and MANAGEMENT STUDIES
(AUTONOMOUS): CHITTOOR
DEPARTMENT of ELECTRONICS and COMMUNICATION ENGINEERING**

II Year B.Tech. I semester

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**16ECE 211 ELECTRONIC DEVICES AND CIRCUITS
(Common to ECE, EEE)**

Course Educational Objectives:

- The course intends to provide an overview of the principles, operation and application of the analog building blocks like diodes, BJT, FET etc for performing various functions
- This course relies on elementary treatment and qualitative analysis and makes use of simple models and equations to illustrate the concepts involved.
- To provide an overview of devices, Biasing & Bias stabilizations.

UNIT -1: JUNCTION DIODES AND CHARACTERISTICS

PN Diode construction and operation, PN Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical Static and Dynamic Resistances, Diode Equivalent circuits, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

UNIT-2: APPLICATIONS OF PN JUNCTION DIODE

PN Junction as a Rectifier, Half wave rectifier, ripple factor, full wave rectifier, Bridge Rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter, π - section filter & Use of Zener Diode as a Regulator.

UNIT -3: TRANSISTOR CHARACTERISTICS

Transistor construction, BJT Operation, BJT Symbol, Transistor as an Amplifier, Common Emitter, Common Base and Common Collector Configurations and its characteristics, Transistor Biasing-Feedback bias & Voltage divider bias.

UNIT -4: FET CHARACTERISTICS

The Junction Field Effect Transistor (Construction, Principle of Operation, Symbol) - Pinch-Off Voltage – Volt-Ampere Characteristics, FET as Voltage Variable Resistor, Comparison between BJT and FET, MOSFET- Basic Concepts, Construction, modes(depletion & enhancement), symbol, principle of operation, characteristics, FET Biasing-Feed back bias & Voltage divider bias.

UNIT -5: SPECIAL PURPOSE ELECTRONIC DEVICES

Tunnel Diode, Varactor Diode, Schottky Barrier Diode, Silicon Control Rectifier, Diac, Triac, LDR, LED, Photo diodes & LCD, Uni-Junction Transistor (UJT), Photo transistors.

Course Outcomes:

- ✓ Know the complete internal structure of PN junction including different types of bias.
- ✓ Acquire sound knowledge on all the electronic devices.
- ✓ Acquire Complete knowledge on different transistors

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Text Books:

1. J. Millman and Christos.C. Halkias, Satyabrata, "Electronic Devices and Circuits", TMH Third edition, 2012,
2. K. Lal kishore, "Electronic Devices and Circuits", BSP. 2nd edition, 2005.

Reference Books:

1. R.L. Boylestad, "Introductory Circuit Analysis", PEARSON, 12th edition, 2013.
2. David A. Bell, "Electronic Devices and Circuits", Oxford University press, 5th Edition, 2008.
3. A. S. Sedra and K. C. Smith, "Microelectronic Circuits", Oxford University Press, 5th Ed.

SITAMS, CHITTOOR