

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

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**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,  $\pi$ - 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. 2<sup>nd</sup> edition, 2005.

**Reference Books:**

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

SITAMS, CHITTOOR