Phys 3701	**ELECTORNICS-I**	**(CR3)**
Preq.	**Phys 2003**	

Objectives

To make students acquire a basic knowledge in solid state electronics including diodes, BJT, FET etc.

Syllabus

The Semiconductor Diode, P-type, N-type semiconductors, the junction diode (biasing and characteristics). The Diode as Rectifier and Switch: The ideal diode model, the half wave rectifier, the full wave rectifier, the bridge rectifier, measurement of ripple factor, the capacitor filter, the π filter, the π -R filter, diode wave shaping circuits (clippers and clampers). Special Diodes: Zener Diode, Light Emitting Diode, Photodiode, Tunnel Diode, Shockley Diode, Other diodes. Circuit Theory and Analysis: Models for circuit, one-port and two-port networks, network theorems, hybrid parameters and equivalent circuit, Power in decibels. The Junction Transistor as an Amplifier: Transistor voltage and current designations, the junction transistors, the volt-ampere curve of a transistor, the current amplification factors, the load line and Q point, the common emitter amplifier, the trans-conductance g_m, performance of a CE amplifier, relation between A_i and A_v, the CB amplifier, the CC amplifier, comparison of amplifier performance. DC Bias for the Transistor: Choice of Q point, variation of Q point, fixed transistor bias, the four resistor bias circuit, design of a voltage feedback bias circuit, Common emitter, common collector, common base biasing. Field Effect Transistor: introduction to field effect transistor (FET), Junction field effect transistor (JFET): operation and static characteristics. Metal oxide semiconductor Field Effect Transistor (MOSFET): operation in enhancement and depletion modes. FET configurations and biasing: Common drain, common source and common gate, load line, fixed bias, self-bias and voltage-divider bias.

Recommended Books
1. *Electronic Devices, by T. L. Floyd, Pearson, (10th Edition), (2017).*
2. *Electronics Fundamentals: Circuits, Devices and Applications, by T. L. Floyd, D. M. Buchla, Prentice Hall, (8th Edition), (2009).*
3. *Electronic Principles, by A. P. Malvino, D. J. Bates, McGraw-Hill, (8th Edition), (2015).*
4. *Solid State Electronic Devices, by B. Streetman and S. K. Banerjee, Pearson, (7th edition), (2015)*
5. *Grob's Basic Electronics, by M. E Schultz, McGraw-Hill, (12th edition), (2015)*
6. *Electronic Devices and Circuit Theory, by R. L. Boylestad, L. Nashelsky, Pearson, (11th Edition), (2012).*
7. *Introductory Electronic Devices and Circuits, by R. T. Paynter, Prentice Hall, (7th edition), (2005).*