



Code	Subject Title	Cr. Hrs	Semester
PHY-304	Electronic Devices and Circuits	4	V
Year	Discipline		
3	Physics		

BJT and FET Frequency Response: General Frequency Considerations, Low-frequency analysis-Bode Plot, Low-frequency Response in BJT and FET Amplifiers, The Miller effect, High-frequency Response in BJT and FE amplifiers, Multistage Effects.

Negative Feedback and Oscillator Circuits: Feedback Concepts, Feedback Types, Practical Feedback Circuits, Oscillator Operation, Phase-shift Oscillator, Colpitts and Hartley Oscillator, Armstrong Oscillator, Wien Bridge Oscillator, Crystal Oscillator. Astable Multivibrator, Monostable Multivibrator, Bistable Multivibrator, Schmitt-trigger circuit.

Power Amplifiers: Class A, Class B and Class C Amplifiers, Class AB Amplifier, Other Power Amplifier Circuits, Power Transistor and Heat Sink.

Operational Amplifiers: Differential Amplifier Circuit, Inverting and Non-inverting configuration, frequency response operational amplifier, OPAM Basics, Practical OPAM Circuits, Constant-gain Amplifier, Voltage Summing, Voltage Buffer.

Power Supplies: Capacitor Filter,  $\pi$ -Filter,  $\pi$ -R Filter, Discrete Transistor Voltage Regulation, Regulation by Zener Diode.

Special Diodes: Varactor, Light Emitting Diode, Zener Diode, Photodiode, Tunnel Diode, Shockley Diode, SCR, Light-activated SCR, Diac, Triac, Unijunction Transistor, LCD.

Introduction to Digital Electronics: The Number Systems, combinational and sequential systems, adder circuits and flip-flops.

#### **Books Recommended:**

1. *Electronic Devices* by Thomas L. Floyd: 5<sup>th</sup> Edition Prentice-Hall Intern. Inc., Englewood Cliffs, (USA), 1999.
2. *Electronic Principles* by Albert P. Malvino, 5<sup>th</sup> Edition Glencoe-McGraw-Hill Book Co., New York (USA) 1993.
3. *Introductory Electronic Devices and Circuits* by Robert T. Paynter, Prentice-Hall Intern. Inc. Upper Saddle River N.Y. USA, 1997
4. *Electronic Devices and Circuit Theory* by Robert Boylestad and Louis Nashelsky 6<sup>th</sup> Edition, Prentice-Hall International, Inc., (USA), 1996
5. *Electronic Devices and Circuits*, by Theodore F. Bogart, Jr. 4<sup>th</sup> Edition, Prentice-Hall, Upper Saddle River, NJ (USA) 1997.
6. *Electronic Circuits and Systems*, by J. D. Ryder, Charles M. Thomson, Prentice-Hall Inc. Englewood Cliffs, New Jersey (USA) 1976.
7. *Digital Technology* by Louis Nashesky, John Wiley and Sons, New york (USA), 1983.
8. *Digital Fundamentals* by Thomas L. Floyd, #rd Ed. Prentice-Hall Intern. Inc., Englewood Cliffs (USA), 1986.
9. *Digital Systems* by Ronald J.Tocci, Prentice-Hall Intern. Inc., Englewood Cliffs (USA), 1995.