

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II Year B.Tech. EEE-II Sem

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(A40413) ELECTRONIC CIRCUITS

Objective:

Electrical circuits plays significant role in day to day life of entire mankind. This course deals with the concept of different types of amplifiers, oscillators, vibrators, clippers, clampers, switching characteristics of various semiconductor devices, linear wave shaping and frequency response of bipolar junction transistor and field effect transistor.

UNIT-I:

Single Stage Amplifiers Design And Analysis: Review of CE, CB, CC & CS amplifiers-Classification of Amplifiers, Distortion in amplifiers-Approximate analysis, CE, CB, CC amplifiers comparison.

FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics-Voltage series-Voltage shunt, Current series and Current shunt Feedback configurations-Simple problems.

UNIT-II:

BJT & FET Frequency Response: Logarithms-Decibels-General frequency consideration-Low frequency analysis-Low frequency response of BJT amplifiers-Low frequency response of FET amplifier-Miller effect capacitance-High frequency response of BJT amplifier-Square wave testing.

UNIT-III:

Multivibrators: Analysis and Design of Bi-stable, Mono-stable, Astable-Multivibrators and Schmitt trigger using transistors.

Clippers and Clampers: Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.

UNIT -IV:

Large Signal Amplifiers: Class -A Power Amplifier, Maximum Value of Efficiency of Class-A Amplifier, Transformer coupled amplifier- Push Pull Amplifier-Complimentary Symmetry Circuits (Transformer Less Class B Power Amplifier)-Phase Inverters, Transistor Power Dissipation, Thermal Runway, Heat sinks.

LINEAR WAVESHAPING: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs.

UNIT-V:

Switching Characteristics of Devices: Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times.

TEXT BOOKS:

1. Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nasheisky, 9th Edition 2007, Pearson Education.
2. Electronic Devices and Circuits by S. Salivahanan, N. Suresh Kumar and A. Vallavaraj, 2nd edition 2008, Tata McGraw Hill Companies.
3. Solid State Pulse Circuits by David A. Bell, 4th Edition, Prentice Hall of India.

REFERENCES:

1. Introductory Electronic Devices and Circuits (Conventional flow version) – Robert T. Paynter, 7th Edition, 2009, PEI.
2. Electronic Devices and Circuits, Anil K. Maini, Varsha Agrawal, 1st Edition, WILEY.
3. Pulse, Digital & Switching Waveforms by Jacob Milliman, Harbert Taub and Mothiki S Prakash rao, 2nd edition 2008, Tata McGraw Hill Companies.

Outcome:

After going through this course the student gets a thorough knowledge on various electronic circuits like oscillators, multi-vibrators, frequency response analysis, clippers and clampers, switching characteristics of semiconductor devices, concept of wave-shaping, with this knowledge they can apply sufficient knowledge for solving real world problems.