**Syllabus for B.Tech. II year I Semester**

**Computer Science and Engineering**

**ANALOG ELECTRONIC CIRCUITS**

**(Common to CSE & IT)**

**L T P/D C**

**Code: 7C354 2 1 0 3**

**COURSE OBJECTIVES:**

* *The objective of this course is to provide the learners with a comprehensive understanding of electronic devices, circuits and their applications*

**COURSE OUTCOMES:**

*After studying this course, the students will be able to*

1. *Learning the operation of diode and its application as rectifiers*
2. *Understand the Fundamentals of BJT operation, Characteristics, different biasing circuits of BJT amplifiers*
3. *Analyze small signal model of BJT with h-parameters*
4. *Describe the working and construction of FETs and characteristics*
5. *Learn the biasing of FET and Analyze the small signal model of FET*
6. *Understand the feedback and analysis of oscillators*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 3 | 3 |  | 3 |  |  |  | 2 |  |  | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 |  |  |  | 2 |  |  | 2 |
| CO3 | 3 | 3 | 3 | 3 |  |  |  |  |  |  |  |  |
| CO4 | 3 | 3 | 3 |  | 3 |  |  |  | 2 |  |  | 2 |
| CO5 | 3 | 3 | 3 | 3 |  |  |  |  |  |  |  |  |
| CO6 | 3 | 3 | 3 | 3 | 3 |  |  |  | 2 |  |  | 2 |
| Overall | 3 | 3 | 3 | 2 | 2 |  |  |  | 1 |  |  | 1 |

**Syllabus Content**

**UNIT-I**

PN JUNCTION DIODE: working of P-N junction diode, its characteristics and Zener Diode Characteristics.

Diode applications: Half wave Rectifier, Full wave Rectifier, Bridge Rectifier: construction, Working, Ripple factor, form factor & amp; Efficiency calculations.

**UNIT- II**

BIPOLAR JUNCTION TRANSISTOR: Definition of Emitter, Base and collector. Basic operation of BJT and current flow. I/P and O/P Characteristics of CE, CB and CC configurations. Transistor as a switch. Switching characteristics (Rise time, Fall time, Delay Time and Storage time), BJT Biasing Methods & Amplification; Stabilization - Fixed Bias, self-Bias and Problems, Concept of Thermal runway in BJTs.

**UNIT-III**

Small signal analysis of BJT: Small signal Model of BJT, h-parameter representation – Exact analysis of CE Amplifier-Approximate analysis of CE and CB Amplifiers - Problems. Frequency response of single stage RC coupled Amplifier.

**UNIT-IV**

FIELD EFFECT TRANSISTOR: Construction & Working of JFET, JFET characteristics, FET Parameters, Construction & Working of MOSFET, MOSFET characteristics (Enhancement and depletion mode), Comparison of JFET & MOSFET.

**UNIT-V**

Biasing and Small Signal Analysis of JFET: Biasing of JFET - Self bias and fixed bias. Small signal Analysis of common source, common drain and common gate amplifier configurations.

**UNIT-VI**

Oscillators: Concept of feedback, Classification of Oscillators. Condition for Oscillations. RC Phase Shift Oscillator, Colpitts Oscillator, Hartley Oscillator and Quartz Crystal Oscillator.

TEXTBOOKS:

1. Electronic Devices and Crcuits- J. Millman, C. C. Halkias and satyabrathajit, Tata McGraw Hill, 2 Ed. 2007

2. Electronic devices and Circuit Theory-Robert L. Boylstead, Louis Nashelsky, 9ht ed., 2008, PE

3. Integrated electronics-J.Milliman and C.C.Halkias, MC Graw –Hill-1972

REFERENCEBOOKS:

1. Electronic circuit analysis -K. Lal Kisshore, 2004, BSP.

2. Electronic Devices: Systems and Applications – Robert Diffenderter, 2nd Indian Reprint., 2010.

3. Electronic Devices and Crcuits by Sanjeev Guptha, Dhapat Rai Publications.

4. Electronic Devices and Circuits by S.Salivahanan and N.Suresh Kumar, Tata Mc Graw Hill Publications.