

BASIC ELECTRONICS			
[As per Choice Based Credit System (CBCS) scheme]			
SEMESTER - I/II			
Course Code	18ELN14/24	CIA Marks	40
Number of Lecture Hours/Week	03 (02 + 01 Tutorial)	SEE Marks	60
Total Number of Lecture Hours	40 (08 Hours per Module)	Exam Hours	03
Credits - 03			
Module-1			
<p>Semiconductor Diodes and Applications: p-n junction diode, Equivalent circuit of diode, Zener Diode, Zener diode as a voltage regulator, Rectification-Half wave rectifier, Full wave rectifier, Bridge rectifier, Capacitor and Choke filter circuit (only qualitative approach). Refer 2.2, 2.3, 2.4 of Text.</p> <p>Photo diode, LED, Photocoupler. Refer 2.7.4, 2.7.5, 2.7.6 of Text.</p> <p>78XX based Fixed IC voltage regulator. Refer 8.4.4 and 8.4.5 of Text.</p>			
Module-2			
<p>BJT and Applications: BJT as an amplifier, BJT as a switch, Transistor switch circuit to switch ON/OFF an LED and a lamp in a power circuit using a relay (refer 4.4 and 4.5 of Ref. Book 1) Feedback Amplifiers – Principle, Properties and advantages of Negative Feedback, Voltage series feedback, Large Signal amplifiers-Class-B amplifier, Class AB amplifier. Refer 7.1-7.6. Oscillators – Barkhausen's criteria for oscillation, RC Phase Shift oscillator, Wien Bridge oscillator. Refer 7.7-7.9 of Text.</p>			
Module-3			
<p>FET and other Components: Field Effect Transistor (FET) – Construction, Operation, Transfer Characteristics, p-channel FET-construction, operation and drain characteristics, Depletion and Enhancement type Metal Oxide Semiconductor (MOSFET), Complementary Metal Oxide Semiconductor (CMOS). Refer 4.2 (except 4.2.8), 4.3 and 4.5. Silicon Controlled Rectifier (SCR) – Two-transistor model, switching action, Characteristics, Phase control application. Refer 3.4 upto 3.4.5 of Text.</p>			

Module-4

Operational Amplifiers and Applications:

Introduction to Op-Amp, Differential Amplifier Configurations, Ideal Characteristics, Op-Amp parameters-CMRR, PSRR, Slew Rate, Input offset voltage, Bias current, frequency response, Pin Configuration of 741 Op-Amp, Applications-Inverting amplifier, Adder, Voltage follower, Integrator, Differentiator, Comparator. Refer 6.1, 6.2 of Text.
Oscillator using IC 555. Refer 17.3 of Text.

Module-5

Digital Electronics Fundamentals:

Difference between analog and digital signals, Number System-Binary, Hexadecimal, Conversion- Decimal to binary, Hexadecimal to decimal and vice-versa, Boolean algebra, Basic and Universal Gates, Full adder, Multiplexer, Decoder, SR and JK flip-flops, Shift register, Counters. Refer 10.1-10.7 of Text.

Principle of operations of Mobile phone – Refer 18.18 of Text.

Text Book:

D.P.Kothari, I.J.Nagarath, “Basic Electronics”, 2nd edn, Mc Graw Hill, 2018.

Reference Books:

1. Thomas L. Floyd ,” Electronic Devices”, Pearson Education, 9th edition, 2012.
2. D.P.Kothari, I.J.Nagarath, “Basic Electronics”, 1st edn, Mc Graw Hill, 2014.
3. David A. Bell, “Electronic Devices and Circuits”, Oxford University Press, 5th Edition, 2008.
4. Muhammad H. Rashid, “Electronics Devices and Circuits”, Cengage Learning, 2014.