NARSIMHAREDDYENGINEERINGCOLLEGE
UGCAUTONOMOUS
ApprovedbyAICTE,NewDelhi&AffiliatedtoJNTUH,HyderabadAccredite dbyNBA&NAAC withAGrade

ANALOG AND DIGITAL ELECTRONICS

B.Tech. II Year I Semester								
Course Code	Category	Hours / Week			Credits	Maxumum Marks		
EC2101ES	Foundation	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact classes: 60	Tutorial Classes : NIL	Practical classes : NIL				Total Classes :60		
Prerequisites: No Prerequisites								

CourseObjectives:
- To introduce components such as diodes, BJT sand FETs.
- To know the applications of components.
- To give understanding of various types of amplifier circuits
- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand the concepts of combinational logic circuits and sequential circuits.

Course Outcomes:

- Know the characteristics of various components.
- Understand the utilization of components.
- Design and analyze small signal amplifier circuits.
- Learn Postulates of Boolean algebra and to minimize combinational functions
- Design and analyze combinational and sequential circuits
- Know about the logic families and realization of logic gates.

COURSE SYLLABUS

MODULE- I
Diodes and Applications: Junction diode characteristics: Open circuited p-n junction, p-n junction asa rectifier, V-I characteristics, effect of temperature, diode resistance, diffusion capacitance, diode switching times, break down diodes,Tunnel diodes, photo diode,LED.
Diode Applications - clipping circuits, comparators, half wave rectifier, Full wave rectifier, rectifier withcapacitorfilter.

MODULE- II

BJTs:Transistorcharacteristics:The junction transistor,transistoras an amplifier,CB,CE,CC configurations, comparison of transistor configurations, the operating point, self-bias or Emitter bias,biascompensation,thermalrunawayandstability,transistoratlowfrequenci es,CEamplifierresponse,gain bandwidth product, Emitter follower, RC coupled amplifier, two cascaded CE and multi stage CEamplifiers.

MODULE- III

FETs and Digital Circuits: FETs: JFET, V-I characteristics, MOSFET, low frequency CS and CDamplifiers, CS and CD amplifiers.

Digital Circuits: Digital (binary) operations of a system, OR gate, AND gate, NOT, EXCLUSIVE OR gate, De Morgan Laws, NAND and NOR DTL gates, modified DTL gates, HTL and TTL gates, output stages, RTL and DCTL, CMOS,Comparison of logic families.

MODULE- IV

Combinational Logic Circuits: Basic Theorems and Properties of Boolean Algebra, Canonical and Standard Forms, Digital Logic Gates, The Map Method, Product - of-Sums Simplification, Don't -Care Conditions, NAND and NOR Implementation, Exclusive - OR Function, BinaryAdder - Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

MODULE- V

Sequential Logic Circuits: Sequential Circuits, Storage Elements: Latches and flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Shift Registers, Ripple Counters, Synchronous Counters, Random-Access Memory, Read only Memory.

TEXT BOOKS:
1. Integrated Electronics: Analog and Digital Circuits and Systems, 2/e,Jaccob Millman,Christos Halkias and Chethan D.Parikh, *Tata McGraw-Hill Education*,India,2010.
2. Digital Design, 5/e, Morris Mano and MichaelD. Cilette, *Pearson, 2011*.

REFERENCE BOOKS:
1. Electronic Devices and Circuits, Jimmy J Cathey, *Schaum soutline series*, 1988.
2. Digital Principles, 3/e, Roger L.Tokheim, *Schaum's outline series*, 1994.