SUMMER TRAINING - 2021

COURSE:-Online Training Program on Industry oriented Electronic Equipments

OBJECTIVE OF THE COURSE

The aim of this program is to provide an exposure to the various modelling and simulation tools and augment the knowledge of students in design and development of electronics and communication equipments for different applications. Design and simulation of Equipments/ Gadgets is meant to reorient the students thinking from basic circuit ideas to practical circuit design approach towards product based design. Talks and online sessions on the tools would also facilitate in innovative learning of various circuit design approaches towards problem solving needs. The course is divided into three modules such as:

DURATION OF THE COURSE: **60 HOURS**

MINIMUM ELIGIBILITY CRITERIA AND PRE-REQUISITE

BASIC KNOWLEDEGE OF DIGITAL ELECTRONICS AND COMMUNICATION ENGINEERNG

- **Module 1 (20 hours):**

  o Brief Introduction ofHDL
  o Introduction to Verilog HDL,Industry demand and career scope
  o Designing in Verilog HDL and its data types
  o Various modeling style used in Verilog HDL
  o Introduction to model Sim and Xilinx
  o To Design Adders and Subtractors using Verilog
  o To Design MUX and De-MUX using Verilog
  o To Design Encoders and Decoders using Verilog
  o To Design SR, JK, D, T and Master Slave Flip Flop
  o To Design different counters using flip flop
  o To Design Mod counters and Shift Registers

- **Module 2 (20 hours):**

  o Introduction to Cadence
  o To Design NOT, NOR, NAND gates using CADENCE and compute the delay
  o To Design 2:1 MUX using CADENCE and compute the delay
  o To Design and simulate D-FLIP FLOP as a MASTER-SLAVE configuration using CADENCE
  o To Design Ring Oscillator using CADENCE and compute the delay
  o To Design and simulate INVERTER Circuit and calculate delay, power for various values of W/L using CADENCE
  o To Design and simulation of diode operation using CADENCE
  o To Design and simulation of different application of diode using CADENCE
  o To Design and simulation of transistor configuration analysis using CADENCE
  o To Design and simulation of switching and amplification operation of transistor using CADENCE
  o To Design and simulation of various configuration of operational amplifier using CADENCE
  o To Design and simulation of different application of operational amplifier using CADENCE
  o To Design and simulation of peak detector circuit using CADENCE
  o To Design and simulation of Wien–bridge Oscillator circuit using CADENCE
  o To Design and simulation of Schmitt Trigger circuit using CADENCE

- **Module 3 (20 hours):**

    o Basic concept of Analog and Digital Communication system
    o Wireless channel, Fading and BER performance of Channel
    o Cognitive radio and Software defined radio (SDR)
    o Fundamentals of MIMO Wireless Communication and Its uses
    o Advance Mobile Communications: 3G, 4G and 5G Technologies
    o Underwater & Underground Communication System
    o Magnetic Induction Communication, Acoustic Communication and Free space optical and its practical applicability
    o Enabling communication technologies for wireless body area networks
    o Overview of satellite communication
    o Basic operation of RADAR system and its practical utilities in Militaries