F.Y.B.Sc.Comp.Sc. (Electronics)revised 2023-24 syllabus for implementation of NEP 2020 for autonomy

Progressive Education Society's Modern College of Arts, Science and Commerce, Ganeshkhind,Pune-411016

F.Y.B.Sc.Comp.Sc. (Electronics)

Revised Syllabus to be implemented from Academic Year 2024-2025

as per guidelins of

National Education Policy -2020 (NEP -2020)

Choice Based Credit System (CBCS) Syllabus of an Autonomous college

Semester- I

Course Title: Analog and Digital Electronics Lab (Practical)

Course Type: SEC **Course Code: CELE 11401**

Teaching Scheme:4 Hours / week

No. of Credits: 2Cr (P)

Examination Scheme: **CIE:** 20 Marks , **ESE**: 30 Marks

Course Objective

- To understand the working operations of various Electronic Devices and Circuits.
- To understand the organization the computer system.

Course Outcomes:- On completion of this course, students will be able

- To understand the working operations of various Electronic Circuits.
- To understand the working operations of various Electronic Components.
- To understand the operation of different Sequential Circuit ICS.
- To know the functional operation of memories.

Course Content

List of Experiments

1. Identification of Electronic Components and introduction to Digital Multimeter
2. Study of Logic gates
3. Study of Half adder/Full adder
4. Study of 4 bit Adder/subtractor
5. Study of Multiplexer / De-multiplexer
6. Study of Flip-flop
7. Study of 3 bit Counter/ Decade Counter
8. Study of Encoder/Decoder
9. Read/write action of RAM (IC 7489)
10. Study of Code converter: 4 bit R-2R DAC
11. Study of 4 bit ALU
12. Virtual Lab Practical- 4 bit Up/Down Counter
13. Virtual Lab Practical- 4 Shift Register
14. Virtual Lab Practical- 4 bit Ring Counter
15. Seat belt Warning System using basic AND and NOT gate :IIT Bombay

https://da-iitb.vlabs.ac.in/exp/seat-belt-warning-system/procedure.html

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Semester- II

Course Title: Smart Instrumentation Systems

Course Type: Minor **Course Code: CELE 12201**

Teaching Scheme: 2 Hours / Week

No. of Credits: 2Cr (T)

Examination Scheme :- CIE: 20 Marks , ESE: 30 Marks

Course Objectives

- To get familiar with concepts of digital electronics and learn basic combinational and sequential circuits
- To understand the importance of instrumentation system
- To study Basic Computer Organization.
- To study Memory Architecture.

Course Outcomes:- On completion of this course, students will be able to :

- To understand how to use Combinational Logic circuits using Logic Gates and using ICs.
- To know the operations of sequential circuits.
- To understand the basic computer system and general organization of different blocks.
- To understand the organization of memory in the computer system and know different types of memories.

Course Contents

Chapter 1 : Digital Circuits **[10 H]**

Introduction to Combinational circuits, Study Half adder and full adder, Multiplexer (4:1) and De- multiplexer, Encoders: Decimal to BCD, Decoder- 3:8 decoder

Introduction to Sequential circuits, Concept of clock signal, Types of Flip flop: clocked RS Flip Flop, D Flip Flop, J K Flip Flop, Concept and types of Shift registers, Counters-3-bit Up/Down counter

Chapter 2 : Sensors and Signal Conditioning **[10 H]**

Block diagram of smart instrumentation system

Sensors : Working principle ,specifications of thermal sensors (LM35),optical sensor(LDR),Motion Sensor(PIR),Ultrasonic ,Image ,Nano sensors

Introduction to Operational Amplifier (OPAMP) :symbol ,basic parameters(input and output impedance ,common mode and differential mode gain, CMRR), opamp as inverting and non-inverting amplifier , opamp as adder subtractor and comparator (Numerical problems)

Chapter 3 : Basics of Computer Organization **[10 H]**

Block diagram of Computer System, Concept of Address Bus, Data Bus, and Control Bus,

CPU organization: Block Diagram of CPU and explanation of each block,

I/O organization: Basic I/O devices, need of I/O interface,

Memory Organization-Types of memories, memory and data read/ write process, vertical and horizontal memory expansion, introduction of cache memory and virtual memory.

Reference Books:

1. Digital Fundamentals: Floyd T.M., Jain R.P., Pearson Education
2. Digital Electronics: Jain R.P., Tata McGraw Hill
3. Sensors and Transducers: D. Patranabis, PHI publication, 2nd Edition
4. Op Amp and Linear Integrated Circuits: Ramakant Gaykwad
5. Digital Logic and Computer Design: M. Morris Mano, Pearson Education
6. Computer Organization and Architecture, William Stallings, Pearson, 10th Ed

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