Digital Logic & Design

Course # COMP 2021

Credits 6

Pre-requisites and Co-requisites: Physics II

Course Description

Digital Logic Design is a technological subject which is intended to make students familiar with different types of designs as sequential logic circuits, combinational logic circuits, trouble shooting of various digital systems, study of various digital systems. It is an introductory electronics course covering Basic Electron Theory, Resistors, Analog and Digital Wave forms, Number systems, Conversions, Logic Gates, Boolean Algebra, Combination Circuit Design, Flip-Flops, Shift Registers and Counters. After reading this course students would have complete understanding about the low-level architecture of any digital system of diverse areas like computer systems, embedded systems, telephony, data processing system, radar, navigation, military systems, medical instruments, process controls etc.

Course Learning Outcomes

Upon completion of this course, students will be able to:

- Identifying and manipulating various number systems and codes.
- Analyze and discuss the principles of logic gates, combinational circuits, and Boolean Algebra.
- Apply Karnaugh maps to simplify Boolean expressions effectively.
- Design a range of combinational circuits, including comparators, adders, detectors, and others.
- Explain the principles and functions of encoders, decoders, multiplexers, and demultiplexers.
- Apply the operations of latches, flip-flops, synchronous and asynchronous counters, clocks, and shift registers in practical scenarios.
- Analyze memory architecture and perform basic memory operations.
- Examine the working of a basic computer processor, including its essential components and operations.

Course Assessments and Grading

Item	**Weight**
Presentations	10%
Quiz activities	10%
Assignments	10%
Mid exam	20%

Item	Weight
Final exam	30%
Project	20%