Course code	Course Name	L-T-P - Credits	Year of Introduction
EE331	Digital Circuits and Embedded Systems Lab	0-0-3-1	2016

Prerequisite: EE309 Microprocessor and embedded systems

Course Objectives
- To impart practical experience in the design and setup of digital circuits and embedded systems.

List of Exercises/Experiments : (Out of 18 experiments listed, 12 experiments are mandatory.)

DIGITAL CIRCUITS EXPERIMENTS : (at least 7 experiments are mandatory)
1. Realisation of SOP & POS functions after K map reduction
2. Half adder & Full adder realization using NAND gates
3. 4-bit adder/subtractor & BCD adder using IC 7483
4. BCD to decimal decoder and BCD to 7-segment decoder & display
5. Study of multiplexer IC and Realization of combinational circuits using multiplexers.
6. Study of counter ICs (7490, 7493)
7. Design of synchronous up, down & modulo N counters
8. Study of shift register IC 7495, ring counter and Johnsons counter
9. VHDL implementation of full adder, 4 bit magnitude comparator

EMBEDDED SYSTEM EXPERIMENTS: (**Out of first six, any two experiments using 8085 and any two using 8086. Out of the last 3 experiments, any two experiments using 8051 or any other open source hardware platforms like PIC, Arduino, MSP430, ARM etc)** (at least 5 experiments are mandatory)
1. Data transfer instructions using different addressing modes and block transfer.
2. Arithmetic operations in binary and BCD-addition, subtraction, multiplication and division
3. Logical instructions- sorting of arrays in ascending and descending order
4. Binary to BCD conversion and vice versa.
5. Interfacing D/A converter- generation of simple waveforms-triangular wave, ramp etc
6. Interfacing A/D converter
7. Square wave generation.
8. LED and LCD display interfacing
9. Motor control

Expected outcome.
The students will be able to
i. design, setup and analyse various digital circuits.
ii. design an embedded system for a particular application