Course Title	Logic Design
Course Code	EE3301
No. of Credit Hrs (Lecture + Tutorial + Lab)	3 (2+0+1)
No. of Contact Hrs (Lecture + Tutorial + Lab)	4 (2+0+2)
Level-Year	5-3
Prerequisite (if any)	EE2401

1) **Course Objectives:**
This course provides students with a comprehensive overview of Logic Design concepts and ideas, number systems, design and optimization of different logic function using gate circuits, logic design for replacing the switches in control system, Sequential clocked synchronous circuits, work in the field of electronics operation and maintenance. In addition, it highlights the topics and concepts taught in logic design lab.

2) **Expected Learning Outcomes:**
After completing this course, the students should be able to:
1. Define and convert between number systems; explain binary arithmetic and Boolean algebra principles. PLO1 [1]
2. Analyze and design combinational logic circuits including adders, encoders, decoders, and multiplexers. PLO2 [2]
3. Design and evaluate sequential logic circuits including flip-flops, registers, and counters. PLO3 [6]
4. Communicate logic circuit designs effectively and relate lab results with theoretical expectations. PLO8 [3]

3) **Course Contents:**
1. Introduction to Number System, Binary, Octal, Decimal and Hexadecimal numbers and Base Conversions.
2. Complements, Binary Codes; Code Converters.
3. Boolean Functions.
4. Basic Logic Gates (OR, AND & NOT, NOR, NAND XOR & XNOR Gates).
5. Adder and Subtractor.
6. Decoders and Encoders.
7. Multiplexers.
8. Latches, Flip-Flops.
9. Registers and Shift Registers.
10. Synchronous and Asynchronous Counters.
11. Introduction to Sequential Circuits.

4) **Logic Design Lab Contents:**
1. Experiment 1: Logic Gates
2. Experiment 2: Adders
3. Experiment 3: Subtractors
4. Experiment 4: Encoder & Decoder
5. Experiment 5: Multiplexer
6. Experiment 6: De-Multiplexer
7. Experiment 7: Flip Flops
8. Experiment 8: Shift Registers
9. Experiment 9: Asynchronous Binary Counters
10. Experiment 10: Synchronous Binary Counters

5) **Teaching Methods:**
- Lectures and Discussion
- Videos
- Self-learning

- Laboratory demonstrations

6) Mode of Evaluation:

Course Assessment Methods

- Quizzes , Assignment, Homeworks, Reports, Presentations etc.
- Lab Work
- Mid Exam
- Final Exam

Evaluation

No	Assessment Activities *	Percentage
1.	Assignments/Quizzes/HomeWorks/Mini-Projects/Presentations/Reports+Quizzes	15%
2.	Mid Exam	25%
3.	Lab/Tutorial (Lab Exam)	10%
4.	Lab/Tutorial (Lab Reports)	10%
5.	Final Exam	40%

7) Textbook(s):

- Digital Design, M. Morris Mano, Michael D. Ciletti , 4th Edition, Prentice Hall.
- Lab Manual

8) References:

1. Digital Logic Design: Tutorial and Laboratory Exercises, John Passafiume and Michael Douglas,Wiley, 2008.