

**EE205: DIGITAL CIRCUITS**  
**CREDITS = 6 (L=4, T=0, P=2)**

**Course objective:**

The subject aims to provide the student with:

C1: Basic theoretical as well as practical knowledge about various digital circuits.

C2: The able to design and develop various digital circuits that forms the basis for understanding of subjects like Microcontroller, PLC etc. to come.

**Teaching and assessment scheme:**

Teaching Scheme			Credit	Marks Distribution				Total Marks
L	T	P		Theory Marks		Practical Marks		
4	0	2	6	ESE	CE	ESE	CE	
					70	30	30	20

**Course contents:**

Unit No.	Topics	Teaching Hours
1	<b><u>Binary Systems and Logic Circuits:</u></b> The Advantage of Binary, Number Systems, the Use of Binary in Digital Systems, Logic Gates, Logic Family Terminology.	07
2	<b><u>Boolean Algebra and combinational logic design:</u></b> Boolean Algebra, Karnaugh Maps, Variable Entered Maps, Realizing Logic Function with Gates, Combinational Design Examples, Decoder, Encoder, Multiplexer, DE multiplexer.	09
3	<b><u>Logic Function Realization with MSI Circuits:</u></b> Combinational Logic with Multiplexers and Decoders, Standard Logic Functions with MSI Circuits, Design Problem Using MSI Circuits.	09
4	<b><u>Flip Flops, counters and registers.(Sequential Circuits):</u></b> R-S Flip flop, J-K Flip Flop, D-Flop Flop, Master slave Flip Flop, types of counters, types of registers.	11
5	<b><u>Logic Families:</u></b> TTL, CMOS, ECL, RTL, I2L, DCTL, MOSFET Logic, And TTL Gates, Comparison of logic families.	07

6 **Programmable Logic Devices and Semiconductor Memories:** 09

Detail architecture, Study of PROM, PAL, PLA, Designing combinational circuits using PLDs. General Architecture of FPGA and CPLD  
Semiconductor memories: memory organization and operation, expanding memory size, Classification and characteristics of memories, RAM, ROM, EPROM, EEPROM, NVRAM, SRAM, DRAM.

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**TOTAL 52**

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**List of references:**

1. A. An and Kumar, "*Fundamentals of digital circuits*" 1<sup>st</sup> edition, PHI publication, 2001
2. R.P. Jain, "*Modern digital electronics*", 3rd edition, 12<sup>th</sup> reprint TMH Publication, 2007.
3. Anil K. Maini, "*Digital Electronics Principal and Integrated Circuits*", WILEY-INDIA
4. M. Morris Mano, "*Digital Logic and Computer Design*", PHI
5. Malvino & Brown, "*Digital Computer Electronics*", Tata McGraw Hill

**Course outcomes (COs):**

At the end of this course students will be able to ...

**CO1:** Design and develop Different digital logic circuits.

**CO2:** Analyze different number systems and its inter-conversions.

**CO3:** Apply the concept of Boolean algebra and its different theorems, properties.

**CO4:** Apply simplification of Boolean functions.

**CO5:** Compare different Combinational as well as sequential circuits.

**CO6:** Analyze the advantages and use of Logic families and different memories.