

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE MODULE OF THE COURSE TAUGHT FOR THE SESSION SEP-FEB: 2026-27

Course Syllabus with CO's

Faculty Member: Mrs. Swathi C A			Academic Year: 2026-27				
Department: Electrical & Electronics Engineering							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs./Sessions
				L	T	P	
1BEE304	Digital Electronic Circuits	Core	Basic Electronics	3	-	-	42 Hrs Theory
Course Objectives	<						

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Flip-Flops Applications: Registers, binary ripple counters, synchronous binary counters, Counters based on shift registers, Design of a synchronous counter, Design of a synchronous mod-n counter using clocked T, JK, D and SR flip-flops.

9 Hours

Module-4:

Sequential systems: Analysis of Clocked Sequential circuits, State Reduction and Assignment, Design Procedure, Design with State Equations, Sequence detector.

Sequential Circuit Design: Mealy and Moore models, State machine notation, Synchronous Sequential circuit analysis. Construction of state diagrams, counter design.

9 Hours

Module-5:

Memories: Read only and Read/Write Memories, Programmable ROM, EPROM, Flash memory.

Logic Families: Characteristic of Digital ICs, Transistor – Transistor Logic (NOT, NAND, NOR), Complementary MOS Logic (NOT, NAND, NOR), Comparison of TTL and CMOS families.

8 Hours

List of Textbooks and Reference Books

Textbooks:

1. Digital Principles and Design, Donald D. Givone, McGraw Hill, 2002.
2. Digital Design, Morris Mano, Prentice Hall of India, Third Edition.

Reference Books:

1. Digital Logic Applications and Design, John M Yarbrough, Thomson Learning, 2001.
2. Fundamentals of logic design, Charles H Roth, Jr, Cengage Learning. Fifth Edition.
3. Digital Systems Design, A Nagoor Kani, CBS Publishers and Distributors, 2026.

Web links and Video Lectures (e-Resources):

1. https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee177
2. <https://nptel.ac.in/courses/106105185/>

Teaching-Learning Process (Innovative Delivery Methods):

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

1. Technology Integration, 2. Collaborative Learning, 3. Flipped Classroom, 4. Visual Based Learning

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Course Outcome	At the end of the course, the student will be able to: 1. Apply Boolean algebra and Karnaugh Maps (K-Maps) to simplify logic expressions and realise digital logic functions. [L3] 2. Design and Analyse combinational logic circuits including decoders, encoders, multiplexers, adders, subtractors, and binary comparators. [L4] 3. Analyse and design sequential logic circuits using latches, flip-flops, registers, and counters. [L4] 4. Develop state diagrams and design synchronous sequential circuits using Mealy and Moore models. [L3] 5. Explain the characteristics and applications of digital integrated circuits, memory devices, and logic families such as TTL and CMOS. [L2]
Assessment Structure: The assessment in each course is divided equally between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each carrying 50% weightage. 1. To qualify and become eligible to appear for SEE, in the CIE, a student must score at least 40% of 50 marks, i.e., 20 marks. 2. To pass the SEE, a student must score at least 35% of 50 marks, i.e., 18 marks. 3. Not- withstanding the above, a student is considered to have passed the course, provided the combined total of CIE and SEE is at least 40 out of 100 marks.	
Continuous Comprehensive Assessments (CCA): CCA will be conducted for a total of 25 marks. It is recommended to include a maximum of two learning activities aimed at enhancing the holistic development of students. These activities should align with course objectives and promote higher-order thinking and application-based learning. Learning Activity -1: (Marks- 15) Learning Activity -2: (Marks-10)	

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Course Code: 1BEE304			TITLE: Digital Electronic Circuits					Faculty Member: Mrs. Swathi C A						
List of Course Outcomes	Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	
	CO-1	3	3	2	2	2	-	-	-	-	-	1	-	2
	CO-2	3	3	3	2	2	-	-	-	-	-	1	-	2
	CO-3	3	3	3	3	2	-	-	-	-	-	1	-	2
	CO-4	3	3	3	3	2	-	-	-	-	-	2	-	2
	CO-5	3	2	2	2	2	1	-	-	-	-	3	-	2

Note: 3= Strong Contribution 2=Average Contribution 1=Weak Contribution '-' = No Contribution

Course coordinator

Vertical Head

HoD