COURSE CONTENT

DIGITAL ELECTRONICS								
I Semester: EEE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
2530460	**Core**	2	0	0	2	40	60	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		
Prerequisites: Electronic Devices and Circuits								

Course Overview:

This course introduces the fundamentals of digital systems, including number systems, logic gates, and Boolean algebra. It covers the design and analysis of combinational and sequential logic circuits. Students will also explore semiconductor memories and programmable logic devices used in modern digital design.

Course Objectives: The students will try to learn

1. Fundamental concepts of digital system design and common forms of number representations and their conversions.
2. Implementation and design logical operations using combinational logic circuits and sequential logic circuits.
3. Semiconductor memories and programmable logic devices.
4. Logical expressions using Boolean algebra and Karnaugh maps for efficient circuit design
5. Various types of semiconductor memories and the architecture of programmable logic devices.

Course Outcomes: After successful completion of the course, students shall be able to

1. Understand the working of logic families and logic gates.
2. Design and implement Combinational and Sequential logic circuits.
3. Implement the given logical problems using programmable logic devices.
4. Simplify and optimize logical functions using Boolean algebra and K-map techniques for hardware implementation.
5. Acquire knowledge of memory organization and the functionality of programmable logic devices used in digital system design.

UNIT-I: Fundamentals of Digital Systems and Logic Families

Digital signals, Digital circuits, AND, OR, NOT, NAND, NOR and Exclusive-OR operations, Boolean algebra, Examples of IC gates, Number systems-binary, Signed binary, Octal hexadecimal number, Binary arithmetic, One's and Two's complements arithmetic.

UNIT-II: Combinational Circuits-I

Standard representation for logic functions, K-map representation and simplification of logic functions using K- map, Minimization of logical functions, Don't care conditions, Multiplexer, De-Multiplexer

UNIT-III: Combinational Circuits-II

Adders, Subtractors, Carry look ahead adder, Digital comparator, Parity checker/generator, Code converters, Priority encoders, Decoders/Drivers for display devices, Q-M method of function

realization

UNIT-IV: Sequential Circuits
Introduction to flip-flops, SR, JK, T and D type's flip-flops, Shift registers, Conversion of flip-flops, Ring counter, Ripple (Asynchronous) counters, Synchronous counters

UNIT-V: Semiconductor Memories and Programmable Logic Devices
Memory organization and operation, expanding memory size, classification and characteristics of memories, sequential memory, read-only memory (ROM), ROM types, Read and write memory (RAM) types, Programmable logic array, Programmable array logic, Field Programmable Gate Array (FPGA).

TEXT BOOKS:

1. Lagune1,Kursbuch,DeutschalsFremdsprache,HarmutAufderstraße,JuttaMüller,Thomas Storz
2. Lagune1,Arbeitsbuch,DeutschalsFremdsprache,HarmutAufderstraße,JuttaMüller, Thomas Storz

REFERENCEBOOKS:

1. Lagune 1, Kursbuch, Deutsch als Fremdsprache, Hueber Verlag, Jutta Müller, Thomas Storz
2. Lagune 1, Arbeitsbuch, Deutsch als Fremdsprache, Hueber Verlag, Jutta Müller, Thomas Storz
3. Menschen A1, Kursbuch, Deutsch als Fremdsprache, Hueber Verlag, Eveline Pude, Angela Dorn, Sylvia Schmitt
4. Studio d A1, Kurs- und Übungsbuch, Deutsch als Fremdsprache, Cornelsen Verlag, Hermann Funk, Christina Kuhn
5. Schritte International Neu A1, Kursbuch, Deutsch als Fremdsprache, Hueber Verlag, Daniela Niebisch, Silvia Storch

ELECTRONICRESOURCES:

1. https://learngerman.dw.com
2. **https://www.goethe.de/ins/in/en/sta/ban/kur/dfd.html**
3. **https://www.duolingo.com/course/de/en/Learn-German**
4. **https://vhs-lernportal.de**
5. **https://www.bbc.co.uk/languages/german**

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper–I
8. Model question paper–II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)