

ENG105 Design of Logic Systems

Level: 1

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY SEMESTER

Synopsis:

The central theme of this course is the analysis, specification and design of a wide variety of digital circuits. Students will learn the theory and application of logic design methods, and use computer-based design packages widely employed in industry. They will undertake design exercises, translating system specifications into circuits that could then be simulated on the computer.

Topics:

- Introduction to VHDL
- VHDL for combinational logic devices
- VHDL for sequential logic devices
- Logic Function Optimization
- Synchronous sequential circuit design
- Synchronous sequential circuit analysis
- Asynchronous sequential circuit analysis
- Asynchronous sequential circuit design
- State reduction and assignment in asynchronous sequential circuit design
- Hazards in asynchronous sequential circuit
- Testing of digital logic circuits

Textbooks:

Stephen Brown and Zvonko Vranesic: Fundamentals of Digital Logic with VHDL Design (Alt ISBN: 9780071284288) 3rd edition McGraw-Hill
ISBN-13: 9780071268806

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Learning Outcome:

- Draw gate-level schematic diagrams and signal waveforms for logic circuits.
- Use Boolean Algebra, Karnaugh map, Quine-Mc-Cluskey methods to simplify logic circuits for optimal costs.
- Identify the prime implicants, static hazards and other characteristics of logic circuits.
- Present the state diagram, excitation table, state table and flow table for FSM.
- Implement logic circuits and logic functions using suitable components.
- Give cost, minimized expression, test vectors for logic circuits.
- Write VHDL code for corresponding logic circuits and logic functions.
- Design logic systems for the specified requirements.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
CLASS TEST	10
CLASS TEST	10
LAB TEST	10
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**