

COURSE DESCRIPTION

Dept., Number	EL E 336	Course Title	Digital Systems Laboratory I
Semester hours	1	Course Coordinator	Allen W. Glisson, Professor

Current Catalog Description

Experiments with digital logic gates. Implementation of combinational and sequential logic circuits, programmable logic devices, flip-flops, and simulation software.

Textbook

A.W. Glisson, *Laboratory Manual for Digital Systems Laboratory EL. E. 336*, 4th edition, Department of Electrical Engineering, University of Mississippi, 2004.

References

Digital Principles and Design, by Donald D. Givone

Logic and Computer Design Fundamentals, by M. M. Mano and C. R. Kime

Course Outcomes

Upon completion of this course, students can:

1. understand and use logic conventions in the implementation of combinational logic circuits;
2. obtain canonical sum-of-products and product-of-sum expressions from logical truth tables;
3. apply DeMorgan's theorem to convert mixed-operation logical expressions into All-Nand operation forms;
4. develop and implement combinational logic circuits from truth tables or logical expressions;
5. develop and implement simple code translation logic circuits;
6. develop and implement programmable logic circuits;
7. understand, use, and describe elementary concepts of assembly language programming;
8. develop, implement, and describe the operation of simple synchronous sequential circuits;

9. use a circuit capture and simulation program to design digital logic circuits;
10. briefly describe in writing what is done in each part of the lab in a clear and concise manner.

Relationship between Course Outcomes and Program Outcomes

Course outcomes 1, 2, and 3 contribute to program outcomes (a) and (j); course outcomes 4, 5, 6, and 8 contribute to program outcome (c); course outcome 7 contributes to program outcome (a); course outcome 9 contributes to program outcome (i); and course outcome 10 contributes to program outcome (f).

Prerequisites by Topic

This is a laboratory meant to be taken with corequisite lecture course EL E 335.

Major Topics Covered in the Course

1. Logic conventions and indicators (1 class)
2. Logic gates and logic operations (1 class)
3. Min-term representations, multiple output networks, and fan-in capability (1 class)
4. Max-term representations, multiple output networks, and fan-in capability (1 class)
5. Code translation (1 class)
6. Controlled circuits, memory addressing (1 class)
7. Construction of flip-flops (1 class)
8. Registers (1 class)
9. Assembly language/Computer simulator (1 class)
10. Circuit simulation and programmable logic devices (2 classes)

Assessment Plan for the Course

The primary assessment tool for this course is an online evaluation done by the students at the end of each semester. Questions on the evaluation address the course objectives. Success is characterized by at least 70% of students either agreeing or strongly agreeing with each evaluation statement. Results are reviewed by an electrical engineering departmental committee once per calendar year to determine if the course objectives are being met, and changes may be made in the course to achieve the course objectives if deemed appropriate by the committee.

How Data in the Course are Used to Assess Program Outcomes (unless adequately covered already in the assessment discussion under Criterion 4)

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Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms			Software design		
Data structures			Concepts of programming languages		