

## COURSE DESCRIPTION

Dept., Number	EL E 386	Course Title	Advanced Digital Systems Laboratory
Semester hours	1	Course Coordinator	Allen Glisson, Professor

### Current Catalog Description

Advanced Digital Systems. MSI Circuits, PLD Devices, VHDL Design and Synthesis, Computer Architecture.

### Textbook

James O. Hamblen, T. S. Hall, and Michael D. Furman, *Rapid Prototyping of Digital Systems*, Quartus II Edition, Springer, 2006.

### References

### Course Outcomes

Upon completion of this course, students can:

1. use PLD's;
2. describe a circuit using a graphical editor and using VHDL;
3. use a modern software tool to simulate a circuit;
4. use a modern software tool to program a PLD;
5. interface multiple levels of MSI circuits to create LSI circuits;
6. design a circuit to meet open-ended design specifications.

### Relationship between Course Outcomes and Program Outcomes

Course outcome 1 contributes to program outcome (a); course outcomes 2, 3, and 4 contribute to program outcome (i); course outcome 5 contributes to program outcome (c); and course outcome 6 contributes to program outcomes (b) and (c).

### Prerequisites by Topic

Advanced Digital Systems (EL E 385): Computer Architecture. Stored program control.

### Major Topics Covered in the Course

- Introduction to Altera PLD's, Graphical Design, and PLD Programming (1 Class)
- Sequential state machine design with graphical tools and VHDL (2 Classes)
- Memory types and interfacing with multiple devices (3 Classes)
- LSI design of an ALU using VHDL (2 Classes)
- Design of a basic computer system with I/O and memory (5 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 is 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		