

COURSE DESCRIPTION

Dept., Number	EL E 385	Course Title	Advanced Digital Systems
Semester hours	3	Course Coordinator	Allen Glisson, Professor

Current Catalog Description

Advanced Digital Systems. Organization and design of digital computing systems. Register transfer language. Computer architecture. Memory. ALU. Addressing modes.

Textbook

M. Morris Mano and Charles R. Kime, *Logic and Computer Design Fundamentals*, 3rd Edition, Prentice Hall: 2004.

References

Course Outcomes

Upon completion of the course, students:

1. can combine MSI circuits into larger or more complex digital circuits;
2. can write a VHDL description of a combinational logic circuit;
3. can write a VHDL description of a sequential state machine;
4. can use current engineering software to compile and simulate circuits, including those described using VHDL;
5. know the architecture of a basic computer system;
6. know the operation of the components of a basic computer system include control, arithmetic processors, registers, and buses;
7. know the relationship between the hardware architecture and a computer's assembly language instruction set.

Relationship between Course Outcomes and Program Outcomes

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

Prerequisites by Topic

- Principles of Digital Systems (ELE 335). Analysis, synthesis, and design of Combinational Logic and Sequential State Machines. Minimization. MSI circuits.
- Principles of Digital Systems Laboratory.

Major Topics Covered in the Course

- Review of prerequisite material (2 classes/3 hours)
- Combining MSI circuits (3 classes/4.5 hours)
- VHDL programming and compiling and simulating (8 classes/12 hours)
- Computer architecture (10 classes/15 hours)
- Tests, solutions, and reviews (5 classes/7.5 hours)

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		