

ENGR 852 Course Syllabus

1. *Course number and name*

ENGR 852: Advanced Digital Design

2. *Credits and contact hours*

3 credit hours; one 2-hour-45-minute lecture sessions/week

3. *Instructor's or course coordinator's name*

Instructor: Hamid Mahmoodi, Assistant Professor of Computer Engineering

Course coordinator: Hamid Mahmoodi, Assistant Professor of Computer Engineering

4. *Text book, title, author, and year*

Advanced Digital Design with the VERILOG HDL by Michael D. Ciletti, Prentice Hall, 2003

a. *other supplemental materials*

Lecture notes

5. *Specific course information*

a. *brief description of the content of the course (catalog description)*

Design of fundamental and pulse mode circuits, design with programmable logic devices, application specific integrated circuits, computer simulation of digital circuits, reliable digital system design techniques, testing and design for testability.

b. *prerequisites or co-requisites*

ENGR 356 or equivalent

c. *indicate whether a required, elective, or selected elective course in the program*

Elective

6. *Specific goals for the course*

• *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

- The student will be able to explain a modern digital design flow
- The student will be able to describe a digital system in Verilog HDL
- The student will be able to perform design optimization and synthesis to gate-level
- The student will be able to use model EDA tools for simulation, verification, and synthesis of digital design
- The student will be able to perform post-synthesis design validation
- The student will be able to map a synthesized design to an ASIC hardware platform
- The student will be able to implement complex digital systems from high-level HDL description down to ASIC implementation

• *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

ENGR 852 Course Syllabus

Course addresses ABET Student Outcome(s): a, b, c, d, e, g, i, j, k.

7. *Brief list of topics to be covered*

- Introduction to digital design methodology
- Review of combinational and sequential logic design fundamentals
- Introduction to logic design with Verilog
- Logic design with behavioral models of combinational and sequential logic
- Synthesis of combinational and sequential logic
- Design and synthesis of datapath controllers
- Post-synthesis tasks
- Introduction to ASICs
- System partitioning
- Floorplanning and Placement
- Routing