University of Wisconsin - Madison
College of Engineering [EGR]

Last Offered: 2015-2016 Spring [1164]

Direct Link to this Syllabus:

1. E C E 453, Embedded Microprocessor System Design
2. Credits : 4    Contact Hours : 5.5
3. Textbook and Materials : ECE 453 Course Notes

a. Other Supplemental Materials : None

• Specific Course Information :

a. Brief description of the content of the course (Course Catalog Description) : Hardware and software design for modern microprocessor-based embedded systems; study of the design process; emphasis on major team design project.
b. Pre-requisites or Co-requisites : ECE 315 & 353
c. This is a Selected Elective course.

• Specific Goals for the Course :

a. Course Outcomes :

1. Students will design digital logic in an FPGA
2. Students will develop a hardware schematic to solve an engineering problem
3. Students will fabricate a prototype design on a PCB based on their hardware schematics
4. Students will deploy an embedded operating system to aide in human interaction with the prototype

• ABET Student Learning Outcomes :

(a) Ability to apply mathematics, science and engineering principles.
(b) Ability to design and conduct experiments, analyze and interpret data.
(c) Ability to design a system, component, or process to meet desired needs.
(d) Ability to function on multidisciplinary teams.
(e) Ability to identify, formulate and solve engineering problems.
(g) Ability to communicate effectively.
(h) The broad education necessary to understand the impact of engineering solutions in a
global and societal context.
(i) Recognition of the need for and an ability to engage in life-long learning.
(j) Knowledge of contemporary issues.
(k) Ability to use the techniques, skills and modern engineering tools necessary for
engineering practice.

- **Brief List of Topics to be Covered:**
  1. Utilization of FPGAs in Embedded Systems
  2. Designing Hardware Platforms Using Discrete Integrated Circuits
  3. PCB Fabrication and Design
  4. Embedded Operating System Principles