Computer Engineering 3151: Digital Engineering Lab II
Prior Number – Computer Engineering 214

Credit and Contact Hours
1 credit hour laboratory (One 1-hour and 50-minute laboratory per week). Computer Engineering 3151 (214) is a laboratory complement to Computer Engineering 3150 (213), taken simultaneously or after Computer Engineering 3150 (213).

Instructor
Graduate Teaching Assistants coordinated by a faculty member
Faculty coordinator varies – J. Stanley, Ph.D.; M. Zawodniok, Ph.D.; M. Choi, Ph.D.

Text(s)
Available at: http://ece.mst.edu/currentcourses/classnotesinfo/


Catalog Information
Advanced digital design techniques, Microcontroller based design, hardware and software codesign.

Prerequisites
Computer Engineering 2210 (111) and 2211 (112). Simultaneous enrollment in (or taken after) Computer Engineering 3150 (213).

Required or Elective
Required

Course Goals
General Outcomes
At the end of this laboratory, students should be able to:
1. Design hardware and software for microcontroller systems
2. Use hardware/software co-verification tools
3. Understand re-use of existing hardware/software modules
4. Keep an engineering notebook and present oral and written reports
5. Work as a team to complete a significant hardware/software design project
Additional objectives include:
6. Laboratory class-sizes will be small, typically at or below 12 students per section
7. Students will perform laboratory exercises in teams of 2-4 students
### Relationship of Course to Program Outcomes

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S – strong connection; M – medium connection; W – weak connection

### Topics Covered

1. Introduction to lab safety, laboratory equipment, and email (1 week)
2. Review of EDA tools (1 week)
3. Design of an eight bit latch (1 week)
4. Hardware/Software co-design with the WIMP51 (2 weeks)
5. Introduction to hardware software co-simulation (1 week)
6. Interfacing the 8051 with address-latched external devices (2 weeks)
7. Using RAM with the 8051 (1 week)
8. Interfacing a Hitachi LCD controller with the 8051 (2 weeks)
9. Interfacing an 8051 with an audio chipset (2 weeks)
10. Serial communication with the 8051 (1 week)
11. Lab practical over the students’ proficiency in the use of laboratory software and equipment, and other material covered (1 week)