EE337 - Course Outline

Rajbabu Velmurugan, Shankar Balachandran

21 July 2015

Course Overview

Objective

- Understand and develop applications on a microcontroller
- Understand, design, and realize a microprocessor on a FPGA using HDL

Complements the Microprocessor theory course (EE309)

Course Overview

Prerequisites

- Digital design using Verilog (EE214)
- Digital system design (EE214)
- Basic programming skills

Course Overview

Skills gained after completion

Microcontroller

- use IDE for developing, simulating and debugging programs
- write assembly and embedded C programs for given problem statements
- interface variety of peripherals like LCD, motors, keypads, etc using appropriate protocols (SPI)

Course Overview

Skills gained after completion

Processor design

- design processor for the given specifications
- implement (using) FSM
- test individual blocks and processor

Course Overview

Microcontroller - Reference text

- The 8051 Microcontroller and Embedded Systems - Using Assembly and C
  a. Kenneth J. Ayala, Dhananjay V. Gadre
  b. Muhammad Ali Mazidi, Janice Gillispie Mazidi, and Rolin D. McKinlay

Website and Logistics

- Course ‘moodle’ site will be used for all communications and information
  http://moodle.iitb.ac.in/course/view.php?id=1965
- WEL lab link will have additional reference material
  http://wel.ee.iitb.ac.in/teaching_labs/Microprocessor/

Timings and Venue

- Two batches: Batch A (BTech), Batch B (DD)
  - Batch A: Monday 2-5 PM
  - Batch B: Tuesday 2-5 PM
- Lab will be held in WEL lab, there might be some lecture sessions for which venue will be announced when needed

Grading Policy

- Lab sessions
  - Microcontroller - 25 %
  - Processor design - 10 %
- Lab exams
  - Exam 1 - 10 %
  - Exam 2 - 20 %
  - Exam 3 - 35 %

Attendance

- Attendance is mandatory
- If you can not attend a lab session for medical reasons, please inform your TA and the lab staff
  - In such situations complete your work before the next lab turn
- All experiments must be completed

Lab Organization

Experiment No. 1 to 8 (microcontroller)

- Will be done independently (on a kit)

Processor design (4 lab sessions)

- Will be done in groups of three

Lab Organization

Prelab and/or homework

- Homework will be assigned on weekly basis
  - due at the beginning of the following turn
  - counted towards in-session work
- You are encouraged to discuss, but bring your own solution
- Your TA will conduct a viva to test your understanding

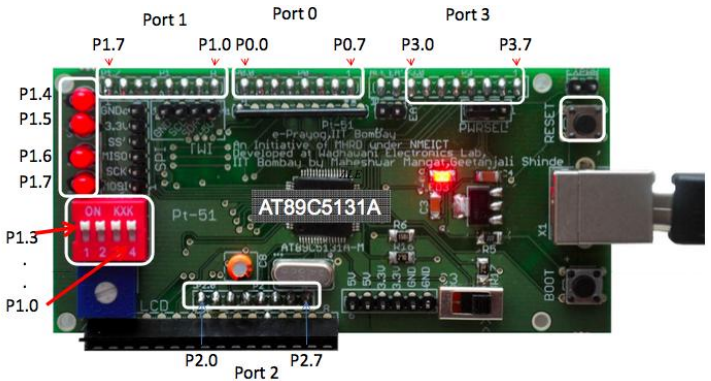
Copying will be considered as cheating. You will get 0 points for that experiment.

Lab Organization

Lab report

- Maintain a lab book for noting down the in-session work, prelab work, design etc.
- You should get it checked by your TA before you start the lab (for pre-lab work) and at the end of the lab for your in-session work.
- 48 pages A-4 size book should suffice.

Lab Organization



Lab kit

- Every student will be issued a lab kit (containing a Pt-51 board, LCD and a keypad, a USB cable, and a screw driver)
- Lab entry without the kit (for relevant sessions) is not acceptable

Note: The development board Pt-51 has been developed, soldered and tested in WEL. Thanks to Maheshwar, Shekhar, Shahin, Sadanand, Amit and Co.!

So please respect their efforts and use the boards carefully and return it (the lab kit) after your end sem exam

Lab Organization

Lab help

- Feel free to ask !
- we, RAs and lab-staff are here to make this lab a good/interesting learning platform