EE337 - Microprocessors Lab

Course Outline

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Course Overview

Objective

- Understand and develop applications on a microcontroller

Complements the Microprocessor theory course (EE309)

Course Overview

Prerequisites

- Digital circuits (EE214)
- Digital systems (EE224)
- 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

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 https://moodle.iitb.ac.in/course/view.php?id=7750
- WEL lab link will have lab handouts and additional reference material

  http://wel.ee.iitb.ac.in/teaching_labs/Microprocessor/

Timings and Venue

- Two batches: Batch A (DD), Batch B (BTech)
  - Batch A: Monday 2-5 PM
  - Batch B: Tuesday 2-5 PM
- Lab will be held in WEL 1 lab
  - some additional lecture sessions for which venue will be announced when needed

Grading Policy

- Lab sessions
  - Microcontroller - 30 %
  - Includes participation and preparation for lab
- Lab exams
  - Exam 1 - 15 %
  - Exam 2 - 20 %
  - Exam 3 - 35 %

Attendance

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

Lab Organization

- About 8 experiments will be done independently (on a kit)
- Two experiments will be done in a team of two

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
- TAs conduct a viva to test your understanding based on your solution

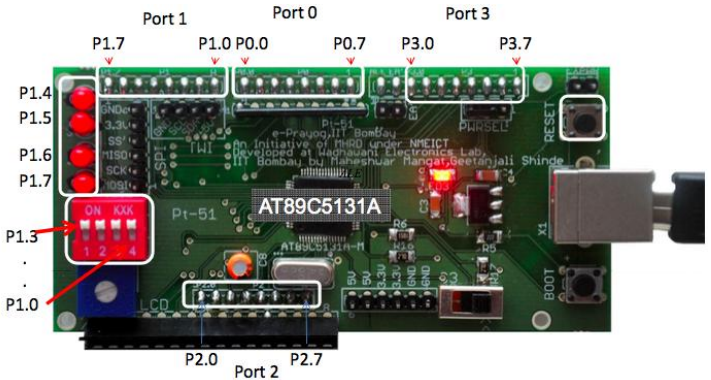
Copying will be considered as cheating. You will get 0 points for that experiment.

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 and softwares

- Every student will be issued a lab kit (containing a Pt-51 board, LCD and a keypad, a USB cable, and a screwdriver)
- Entry without the kit and tool kit (for relevant sessions) is not acceptable
- Install the softwares (Keil and Flip) on your personal laptops and bring it from next lab session.

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

Download links for softwares

- FLIP download

  https://www.microchip.com/developmenttools/ProductDetails/FLIP

- ARM Keil-C51 download

  https://www.keil.com/demo/eval/c51.htm#/DOWNLOAD

  (requires registration)

Lab Organization

Lab help

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