

EE337 - Microprocessors Lab

Course Outline

Jan 10, 2022

Instructors

TAs

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Staff

Mahesh Bhaganagare, Amit Shetye, Maheshwar Mangat

Faculty

Saravanan Vijayakumaran, Nikhil Karamchandani

Course Objective

- Understand and develop applications on the 8051 microcontroller
- Complements the Microprocessor theory course (EE309)

Skills Gained

- Developing, simulating and debugging programs using the IDE
- Write assembly and embedded C programs for given problem statements
- Interface variety of peripherals like LCD, keypad using appropriate protocols

Prerequisites

- EE 214 Digital circuits
- EE 224 Digital systems
- EE 309 Microprocessors
 - Taking it this semester is also fine
- Basic programming skills

Grading Policy

- Lab experiments (50 %)
 - Approximately 8 labs
 - Follow deadlines for submissions
 - Penalty for late submissions:
 - 10% for delay upto 1 day from the deadline
 - Additional 20% for delay between 1 and 2 days from the deadline
 - Additional 30% for delay between 2 and 3 days from the deadline
 - Additional 40% for delay more than 3 days from the deadline.
- Assignments (20 %)
 - Once a week in Moodle
- Endsem (30 %)
- Relative grading
 - Last year, grade thresholds were set to penalize malpractice

Lab Experiment Evaluation

- One TA will be assigned for a group of approximately 6 students
- You will show your work to the TA by sharing your screen using MS Teams
- TA will ask questions to test your understanding
- You are encouraged to discuss, but prepare your own solution
- **Penalties for any academic dishonesty**

What counts as malpractice?

- Copying code from the web, getting others to solve etc
- Sharing your code with your classmates
 - Multiple instances of this last year
 - Both parties (source and receiver) get the same penalty
 - Source is first adamant he/she did not copy or share
 - After evidence, they admit they shared but receiver promised they will not copy as is. Only for inspiration dude!
 - Then receiver writes to instructors praising source's stellar academic record and integrity. And requests that source be spared
- Sharing your code on a public Github repo or webpage
 - If you want to showcase your skills, pick something other than assigned lab exercise solutions to share
- Above list is not exhaustive.

Timings and Venue

- Lab slot: **Mondays : 2 to 5 PM**
 - Don't register for any other course in this slot
- Attend your assigned slot by joining relevant channel in MS Teams
- Additional lecture sessions as needed - mostly during lab time

Website and Logistics

- Course website <https://ee337.github.io>
- MS Teams for meetings/interaction
- Course Moodle will be used for announcements, assignments, grades
 - Separate Moodle forum for debugging board issues
- Always check your marks in Moodle
 - Students got zero for malpractice but did not realize it until the end
 - TA forgot to enter marks but students didn't notice until grade was assigned

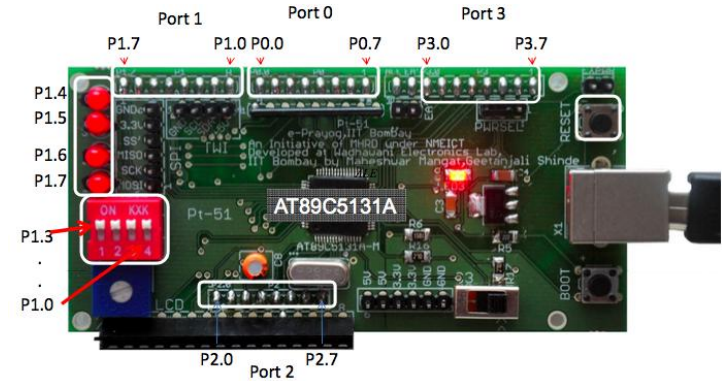
Attendance

- Attendance is mandatory
 - Penalties for missed lab evaluation sessions will be applicable.
 - If network issues prevent you from attending, SMS/call your TA.
- If you cannot attend a lab session for medical reasons, inform us and your TA
 - Email sarva@ee.iitb.ac.in, nikhilk@ee.iitb.ac.in with CC to TA

Reference Texts

- The 8051 Microcontroller and Embedded Systems - Using Assembly and C, Second edition
 - Muhammad Ali Mazidi, Janice Gillispie Mazidi, and Rolin D. McKinlay
 - <https://www.amazon.in/dp/8131710262>
- The 8051 Microcontroller, Third Edition
 - Kenneth J. Ayala
 - <https://www.amazon.in/dp/8131502007>

Lab kit and software



- Every student will receive a lab kit
 - A Pt-51 board, LCD, a keypad, a USB cable
- Install the software (Keil and Flip) on your personal laptops and make sure the kit is working correctly (see the self-test procedure)

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) once you come back !

Download links for softwares

- ARM Keil-C51 download

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

(requires registration)

- FLIP download

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

Programming is rewarding



Programming Wisdom
@CodeWisdom



“Programming is the art of doing one thing at a time” -
Michael Feathers

6:07 PM · Aug 20, 2019



 908  194 people are Tweeting about this



Programming Wisdom
@CodeWisdom



"Debugging is like being the detective in a crime movie
where you are also the murderer." - Filipe Fortes

1:33 AM · Aug 17, 2017



 3.7K  2.4K people are Tweeting about this

How to avoid cheating?

- Read/watch all resources shared by instructors
- Contact us in case something is not clear
- Start early on assigned work
 - Why is starting early important?
- Let me explain using some writing by Jeff Bezos
 - [2017 Letter to Shareholders](#)
 - How do you stay ahead of ever-rising customer expectations?
 - Ans: High standards
 - Are high standards universal or domain specific?
 - Ans: Domain specific
 - Are high standards intrinsic or teachable?
 - Ans: Teachable

What do you need to achieve high standards in a particular domain area?

- Recognition and scope
- First, you have to be able to **recognize** what good looks like in that domain
- Second, you must have realistic expectations for how hard it should be (how much work it will take) to achieve that result – the **scope**.
- A story about perfect handstands (in Bezos' words)
 - A close friend recently decided to learn to do a perfect free-standing handstand. No leaning against a wall.
 - Not for just a few seconds. Instagram good.
 - She decided to start her journey by taking a handstand workshop at her yoga studio.
 - She then practiced for a while but wasn't getting the results she wanted. So, she hired a handstand coach.
 - In the very first lesson, the coach gave her some wonderful advice. "Most people," he said, "think that if they work hard, they should be able to master a handstand in about two weeks. **The reality is that it takes about six months of daily practice. If you think you should be able to do it in two weeks, you're just going to end up quitting.**"
 - Unrealistic beliefs on scope – often hidden and undiscussed – kill high standards.

What does this story have to do with EE337?

- Recall I started this digression as an answer to “Why is starting early important”?
- Handstand coach said:
 - The reality is that it (perfect handstands) takes about **six months** of daily practice. If you think you should be able to do it in **two weeks**, you’re just going to end up quitting
- EE 337 Instructors say:
 - The reality is that a particular lab assignment may take about **twelve hours** of work. If you think you should be able to do it in **two hours**, you’re just going to end up quitting.
 - And you might end up copying.
- So start early!
- What about recognition? How to recognize what is a good result?
 - Labsheets will have clearly defined goals to be achieved. So this is easy.

**Thank you for your
attention.
Good luck!**

<https://ee337.github.io/>