

EE309: Computer Organization, Architecture and MicroProcessors

<http://www.ee.iitb.ac.in/~sumantra/courses/up/up.html>

Schedule for classes:

Tue: 09:30 - 10:30, Thu: 10:30 - 11:30, Fri: 08:30 - 09:30

Credits: 6

EE: A-104

References:

1. R. S. Gaonkar. *Microprocessor Architecture, Programming and Applications with the 8085, 4th Edition*. Penram International Publishing (India).
2. P. K. Ghosh, P. K. Sridhar. *0000 to 8085: Intorduction to Microprocessors for Engineers and Scientists, 2nd Edition*. PHI, 2002.
3. J. Uffenbeck. *Microcomputers and Microprocessors, 3rd Edition*. PHI, 2002.
4. K. Hwang, F. A. Briggs. *Computer Architecture and Parallel Processing*. McGraw-Hill Book Co., 1985.
5. M. M. Mano. *Computer System Architecture, Third Edition*. PHI, 1993.
6. P. Kogge. *Architecture of Pipelined Computers*. McGraw-Hill Book Co., 1977.
7. W. Stallings. *Computer Organization and Architecture*. Macmillan Publishing Company, 1986.
8. D. A. Patterson. *Reduced Instruction Set Computers*. Communications of the ACM, vol. 28, no. 1, January 1985, pp. 8-21.
9. K. Hwang. *Advanced Computer Architecture: Parallelism, Scalability, Programmability*. McGraw-Hill, Inc., 1993.
10. D. A. Patterson, J. L. Hennessy. *Computer Organization and Design: The Hardware/Software Interface, Second Edition*. Morgan Kaufmann Publishers, 1997.
11. J. L. Hennessy, D. A. Patterson. *Computer Architecture: A Quantitative Approach, Second Edition*. Morgan Kaufmann Publishers, 1995.

Assignment (Mini Project) ... A combination of theoretical work as well as programming work. Both will be scrutinized in detail for original work and thoroughness. For programming assignments, there will be credit for good coding. Spaghetti coding will be penalized. Program correctness or good programming alone will not fetch you full credit ... also required are results of extensive experimentation with varying various program parameters, and explaining the results thus obtained. Assignments will have to be submitted on or before the due date and time. Late submissions will not be considered at all. Unfair means will be result in assigning as marks, the number said to have been discovered by the ancient Indians, *to both parties (un)concerned*.

Examinations and Grading Information:

Mid-Sem: 40

Mini Project: 15

End-Sem: 45

Attendance Requirements: As per Institute rules for Dual Degree and B.Tech students. **Illness policy:** illness to be certified by the IITB Hospital
Attendance in Examinations is Compulsory.

Proposed Course Outline

I. Introduction to Computer Organization *In a Nutshell ...*

1. A very simple 'Basic Computer'
2. Hardware / Software ? Hardware, Machine Language & Assembly Language
3. Microprogrammed Control
4. CPU Design, Microprocessors
5. Memory Organization
6. I/O Organization

II. The 8085 Microprocessor: A Case Study *Functionality in Simplicity*

...

1. The 8085: Hardware and Interfacing
2. Programming the 8085
3. Interfacing Peripherals and Applications

III. Miscellaneous Topics

1. RISC *The SUN rises ... taking a RISC with SPARCs ...*
2. Arithmetic *The three Rs ...*
3. Performance Measures *He put in his thumb, and pulled out a plum ...*
4. Cache *Money makes the Mare move ...*

IV. Parallelism

1. What is Parallelism ?
2. Vector / Array Processing
3. Pipelining
4. Multiprocessor Systems