



CENG 311

Computer Architecture

Asst. Prof. Tolga Ayav, Ph.D.

Department of Computer Engineering
İzmir Institute of Technology

Course Objectives

- Basic computer organization and design
- MIPS architecture
- Microprocessor design and implementation using FPGAs
- VHDL
- Assembly
- Pipelining and other performance issues

Course Info

- **Homepage:**
<http://www.iyte.edu.tr/~tolgaayav/courses/ceng311>
- **Lecture:** Wednesday 8:45 – 11:30, Thursday 15:30 – 17:15
- **Credits:** 3 + 2 (4)
- **Instructor:** Asst. Prof. Dr. Tolga AYAV (Room: 103, Phone: 750 7878)
- **Lab Assistants:** Res. Asst. Orhan Dağdeviren, Res. Asst. Murat ÖZKAN

Course Contents

- Introduction to Computer Architecture and Basic Computer Organization (1 week)
- VHDL, Introduction to FPGA (1 week)
- Arithmetic for Computers (1 week)
- MIPS architecture and Assembly (1 week)
- Design of a very simple microprocessor: μ Pabs (2 weeks)
- Software: Compilers, assemblers, linkers etc. (1 week)
- Design of a general purpose microprocessor: μ P311 (3 weeks)
- Pipelining (1 week)

Bibliography

- David A. Patterson, John L. Hennessy. *Computer Organization and Design*. 3rd Ed. 2005. Morgan Kaufmann Pub. (TEXTBOOK)
- Brey, B.B. (1991). *The Intel Microprocessors*. 3rd Ed. New York and Toronto : Macmillan.
- Mano, M. (1988). *Computer Engineering: Hardware Design*. Englewood Cliffs, NJ: Prentice-Hall .
- Tanenbaum, A.S. (1999). *Structured Computer Organization*. 4th Ed. Englewood Cliffs, NJ: Prentice-Hall.
- Herman Lam, John O'Malley, *Fundamentals of Computer Engineering: Logic Design and Microprocessors*, Wiley.
- Enoch O. Hwang, *Digital Logic and Microprocessor Design with VHDL* ([online](#)).

Grading

Written Midterm Exam I	% 20
Written Midterm Exam II	% 20
Written Final Exam	% 35
Laboratory Work	% 20
Assignments	-
Quiz	% 5
Term Project	-

Laboratory Works

- Check the lab work on the website and complete the “to-do”s given in pre-lab section and please always get prepared before the lab hours.
- You are supposed to have checked your lab results immediately or in the following lab hours.
- No later than the following lab hours.
- No cooperation on the lab works.