

ENEE446: Digital Computer Design

Credits: 3

Description

Prerequisite: ENEE350; and completion of all lower-division technical courses in the EE curriculum.

Restriction: Permission of ENGR-Electrical & Computer Engineering department.

Credit only granted for: ENEE446 or CMSC411.

Hardware design of digital computers. Arithmetic and logic units, adders, multipliers and dividers. Floating-point arithmetic units. Bus and register structures. Control units, both hardwired and microprogrammed. Index registers, stacks, and other addressing schemes. Interrupts, DMA and interfacing.

Semesters Offered

Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021

[Testudo](#)

Learning Objectives

- Introduction to quantitative principles of digital computer design
- Understanding the architecture of current digital computers
- Contemporary issues in computer architecture
- A developmental understanding of computer architecture
- Current and potential roles for parallelism in computer architecture

Topics Covered

- Principles of computer design
- Cost/performance of design options
- Processor design
- Instruction set design and implementation
- Pipelining and instruction-level parallelism
- Floating-point arithmetic
- Memory-hierarchy design: caches, main memory, virtual memory
- Input/output design and performance measures, types of I/O devices, connections of I/O to CPU and main memory
- The increasing role of parallelism from fine-grained to coarse-grained; what forms of parallelisms appear to be easier for programmers