ESE 345: Computer Architecture

Fall 2017

Description: This course focuses on the fundamental techniques of designing and evaluating modern computer architectures and tradeoffs present at the hardware/software boundary. The emphasis is on instruction set design, processor design, memory and parallel processing. Students will undertake a design project using a hardware description language and modern CAD tools.

Prerequisites: ESE380 ESE382 3 credits

Instructor: Prof. Mikhail Dorojevets
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Course's website: http://www.ece.stonybrook.edu/~midor/ESE345/index.html

Teaching Assistants: Tianchu Ji
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TA hours: Tue & Thu 10:00 -11:00 AM

Lecture: MW 7:00-8:20 PM, 102 Light Engineering

Text: David A. Patterson and John L. Hennessy "Computer Organization &
                        Design The Hardware/Software Interface," Fifth Edition by David A. Patterson
                        and John L. Hennessy, 2014 by Elsevier Inc. ISBN:978-0-12-407726-3

Recommended Books on the VHDL:

1. Peter J. Ashenden. The Designer's Guide to VHDL, 3rd edition, Morgan Kaufmann Publishers, 2008, ISBN: 978-0-12-088785-9.

Project Deadline: Last week of classes

Course Grading: Homeworks: 15%
                        Exams: (two in-class midterms): 65%
                        Project: 20%

Course Learning Outcomes:

Upon completion of this course, students will learn: 1) computer performance and instruction set design principles, 2) MIPS architecture and basics of assembly

language programming, 3) integer and floating-point arithmetic, 4) processor, caches, and memory design, and 5) use of VHDL/Verilog languages in the processor datapath design and verification.