

# ESE 345: Computer Architecture

Fall 2016

**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 input/output. Students will undertake a design project using a hardware description language and modern CAD tools.

**Prerequisites:** ESE 382 3 credits

**Instructor:** Prof. Mikhail Dorojevets  
**Office:** 243 Light Engineering, 632-8611  
**Office Hours:** Monday, Wednesday 9:50 –11:50 AM  
**E-mail:** [mikhail.dorojevets@stonybrook.edu](mailto:mikhail.dorojevets@stonybrook.edu)

**Course's website:** <http://www.ece.stonybrook.edu/~midor/ESE345/index.html>

**Teaching Assistant:** TBA  
**Email:** TBA

**TA office:** 208 Light Eng.  
**TA hours:** TBA

**Lecture:** MW 7:00-8:20 PM, 152 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.

**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.