ESE 565 Parallel Processing Architectures Fall 2020

The goal of this course is to provide in-depth understanding of modern parallel computer architectures and the introduction to parallel programming with ISPC, Pthreads, and OpenMP. We will seek to understand the fundamental design issues, engineering tradeoffs, and essential interplay of hardware and software that cut across parallel machines, rather than simply consider a descriptive taxonomy. The emphasis is on shared memory and data parallel systems. Students will undertake a system design/analysis/parallel programming project either of their own choice or the "default" one on multi-core VHDL design suggested by the Instructor.

Prerequisites: ESE 545 or equivalent. 3 credits

Web page: http://www.ece.sunysb.edu/~midor/ESE565/index.html

Instructor: Prof. Mikhail Dorojevets

Office: 243 Light Engineering, 632-8611

Office hours: Wednesday 10:00-11:00 AM **by Skype**

E-mail: mikhail.dorojevets@stonybrook.edu

Lectures: Thursday **6:30-9:20 PM by Skype**.

Please email me your Skype name to have you included in the ESE565 group before the semester starts.

Textbooks (recommended):

- D. Culler and J. Singh, Parallel Computer Architecture, ISBN 1-55860-343-3, Morgan Kaufmann Publishers, 1999
- Dubois, Annavaram, Stenstrom, Parallel Computer Organization and Design, Cambridge Univ. Press, 2012.
- J. Hennessy and D. Patterson, Computer Architecture: A Quantitative Approach**, Sixth edition**, Morgan Kaufmann Publishers (Elsevier), 2019, ISBN: 978-0-12-811905-1.

Course Grading:

- **Individual** parallel programming assignments with POSIX threads, OpenMP, and ISPC - 25%
- Quiz - 15%
- Project (one or two people teams) - 60%

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would urge that you contact the staff in the Disabled Student Services office (DSS), room 133 Humanities, 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.