ECE 6095 Advanced Multicore Architectures
Spring 2016

Class Meeting Time:
TuTh 12:30-1:45pm, OAK 401 (Lectures)

Instructor:
Prof. Omer Khan
Office: ITEB 447
Email: khan@uconn.edu
Office Hours: by appointment via email
Course website: http://www.engr.uconn.edu/~omer.khan/courses/multicore_s16/index.html

Course Overview:

With the aggressive adoption of multicore processors by the computer industry, parallel computing is no longer a forward looking research topic, rather it has come mainstream. This course focuses on how to architect, design and to program multicores. Accordingly, the course caters both to students interested in writing software for multicores, and to those interested in parallel computing architectures.

The (tentative) schedule for the course is as follows:
1. Overview of Multicore Architectures
2. Parallel computation models
3. Parallel programming patterns
4. Shared memory model
5. Cache coherence
6. Memory consistency model
7. Multicore cache architectures
8. Interconnection networks-on-chip
9. Advanced topics: Transactional memory, GPUs, Emerging technologies

The course will comprise lectures, readings, a laboratory component that will involve programming and power/performance analysis using a multicore simulator. The students will do a final project at the end of the term.

Grading Policy:

One Written Exam	30%
Labs (3-4 assignments)	30%
Project	40%

Rules:
- Completion of labs is ***required.*** Lab assignments are due on the date and at the time specified. Late penalties will be outlined in the assignment handouts and strictly enforced.

- I strongly encourage you to form a group of up to two students and work together on the project. The project must be a quantitative architectural evaluation of a parallel application

using the multicore simulator. The application must be designed by the students and configured to achieve high performance and energy efficiency. The project related deadlines are required and no late submissions will be accepted (unless prior instructor consent is granted):

- o March 8: 1-page project proposal due including your application's sequential pseudo-code
- o March 25: Project plan due (quantify all intermediate and final deliverables)
- o April 28: Final deliverables and report due
- o May 2—7: Meet the instructor to present and discuss the project

- There will be one exam in class. Make-up exam will be given only in extraordinary situations. Excused absence from an exam must be obtained in advance except under very rare circumstances. The exams will be closed book, with two exceptions:
  - o The student may bring into the exam 4 sheets of paper on which the student is free to write anything he/she wishes. All four sheets must be original sheets in the student's own handwriting.
  - o Each student may bring into the exam any handouts that have been expressly permitted by the instructor prior to the exam.