DEPARTMENT OF COMPUTER SCIENCE COURSE SYLLABUS

CS 63305/73305  MULTICORE COMPUTING  3 Credit Hours

Instructor’s Name: Qiang Guan


Course Content:
(Slashed with CS 73305) Starting about 2005, hardware architects began putting more than one processing core on a single chip, leading to the recent rapid advancements in multicore processor architectures. This shift has changed almost everything ranging from memory hierarchy and consistency to programming those architectures. The goal of this course is to study multicore processor architectures from the perspective of hardware, software and algorithm design, the challenges, and the technologies that are relevant to those architectures.

Prerequisites or co-requisites:  Graduate standing
Required: BS-CS.
Elective: BS-Other.

Topics to be Covered, 45 hours:
1. Multicore system architecture, 3 hours.
2. Multicore programming model, 6 hours.
3. Share memory computing, 6 hours.
4. Synchronization and scheduling, 6 hours.
5. GPU and GPU programming, 6 hours.
6. Parallel algorithms, 6 hours.
7. Scalable algorithms, 6 hours.
8. Debugging in multicore computing system, 6 hours.

Learning Outcomes:
1. Understand the multicore programming model.
2. Understand the multicore system.
3. Understand the data-level parallelism.
4. Understand the thread-level parallelism.
5. Grasp the programming skills of writing multicore programs.
6. Describe the cutting-edge state of the art in multicore computing.

Topics to be Covered:
1. Four-six moderate length programming assignments.
2. Two-three written assignments on multi-core system.
3. Midterm and final exams.
4. Scientific research paper reading and presentation.
5. Term project.