CS 706: PARALLEL PROGRAMMING ON HETEROGENEOUS PLATFORMS   (3-0-0:3)

Basics of Concurrency Theory
> Race Conditions, Mutual Exclusion with Semaphores.
> Scheduling Algorithms

Multicore Architecture, SIMD execution model.

GPUs as Co-Processors for Heterogeneous Computing.
> Nvidia GPU architecture (Fermi and Kepler Architecture)
> CUDA programming model. Introduction to Heterogeneous Programming with CUDA.
> Memory model of GPU. Tiling for conserving memory bandwidth.

Introduction to OpenMP, OpenCL and C++AMP.

Exercise programs in CUDA, OpenMP, C++AMP, OpenCL.

References:

1. A.W. Roscoe, The Theory and Practice of Concurrency Theory.
2. M.J. Flynn, Computer Architecture: Pipelined and Parallel Processor Design, Narosa Publishing House/ Jones and Bartlett.
3. D.A. Patterson, J.L. Hennessy, Computer Architecture: A Quantitative Approach, Morgan Kaufmann Publishers.
4. David Kirk and Wen-mei Hwu, Programming Massively Parallel Processors: A Hands-on Approach (Applications of GPU Computing Series).
5. http://docs.nvidia.com/cuda/cuda-c-programming-guide/index.html