THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Parallel Computing

CSE 5441

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Parallel programming models; sequential and parallel performance issues; high-performance computer architecture; design, analysis, implementation and performance evaluation of parallel algorithms.

Prerequisites and Co-requisites:
Prereq: 2231, 2321, and 2421; or 2231, 2321, and 3430; or 2231, 2321, 2451, and ECE 2560; or Grad standing.

Course Goals / Objectives:
- Be competent with the fundamental factors affecting the performance of sequential programs
- Be competent with program transformations to enhance data locality and improve performance
- Be familiar with the prevalent parallel programming models
- Be familiar with design, implementation and analysis performance analysis of parallel programs

Course Topics:

- Fundamental performance issues
- Cache and its impact on performance
- Loop Transformations for performance enhancement
- Data dependence analysis
- Overview of parallel architectures and programming models
- Shared-memory parallel programming
- Message passing
- Programming GPUs
- Programming for high performance with short-vector SIMD instruction sets

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Designation:

Elective