

CS 4523: Programming Massively Parallel Processors

3 Credit Hours

Prerequisite: CS 3305 and CS 3502

A study of practical parallel algorithms with an emphasis on implementation and performance issues on massively parallel processors. Design and implement high performance computing applications using CUDA running on Graphics Processing Unit (GPU). Topics include heterogeneous parallel programming, hardware threading models, synchronization, parallel blocking algorithms, register allocations, memory performance, and inter-thread communication.

CS 4524: Cloud Computing

3 Credit Hours

Prerequisite: CS 4504

This course discusses the fundamental concepts and techniques of cloud computing. Students will develop an understanding of cloud computing architecture, Infrastructure as a Service (IaaS), Platform-as-a-Service (PaaS), Software as a Service (SaaS), Virtualization, and Application Development on Cloud.

CS 4612: Software Security

3 Credit Hours

Prerequisite: CS 3502 and CS 3626

The course introduces the fundamental concepts and principles of software security. Topics covered include buffer overflows, defense mechanisms, return oriented programming, reverse engineering, vulnerabilities analysis. Additional topics: mobile security, hardware platform security, embedded system security.

CS 4622: Computer Networks

3 Credit Hours

Prerequisite: CS 3503 and CS 3622

This course covers computer networking and includes software application-related, protocol-related and security-related issues involved in the Internet. Topics include basic network structures, mechanisms for application-to-application communications, protocol layering, Internet addressing, unicast and multicast routing, connection establishment and termination, data flow and congestion control, and error handling. A specific protocol suite will be examined in detail. More advanced topics that build on the student's understanding of network protocols are also introduced, such as network security, mobile networks and the future Internet.