CS 4504: Parallel and Distributed Computing

3 Credit Hours

Prerequisite: CS 3305 and CS 3503
Concurrent: CS 3502

This course introduces students to the fundamental principles common to the design and implementation of programs that run on two or more interconnected computer systems - in parallel or distributed configurations. Topics to be covered include: essentials of operating systems, network protocols for process communication, and synchronization using message queues; understanding of client-server paradigms, web-based group or collaborative communication systems; advanced distributed computing paradigms for parallel computing and handling concurrency issues; and sockets. Programming will focus on using API's for parallel or distributed applications (e.g., MPI and RMI).

CS 4512: Systems Programming

3 Credit Hours

Prerequisite: CS 3305 and CS 3502

This course presents an introduction to systems programming in Linux/Unix. Topics include file I/O, process control and communication, threading, and network-aware systems programs.

CS 4514: Real-Time Systems

3 Credit Hours

Prerequisite: CS 3502

This course covers the software-development life cycle as it applies to real-time systems. Alternatives: • Including labs that involve the use of a real-time operating system and an associated development environment, or • Modeling with UML, and object oriented simulation. Introduction to formal specification of real-time systems. A course project is required to be completed by the end of the semester.

CS 4522: HPC & Parallel Programming

3 Credit Hours

Prerequisite: CS 4504

This course will introduce parallel programming techniques for shared memory and distributed memory systems. Topics include threading, OpenMP, and MPI.