COMP 790-033  Fall 2022  
Wed 2.45 – 5.15 PM in SN 011*
Topics in Parallel Computing  
(3 credit hours)  
Instructor: Jan Prins

This graduate seminar in Computer Science will examine programming languages and models for parallel computation. We will study a variety of current parallel programming languages and consider advantages and shortcomings for shared-memory and distributed-memory processors, and examine their performance scalability using current hardware.

We will also explore emerging quantum computing models that may potentially be the source of greatly increased performance for a restricted class of parallel computation.

Participants in this seminar will be expected to make a presentation of a programming project with scalable performance using one of the parallel computing models.

**Topics**

- PRAM: Parallel Random Access Machines
- Shared Memory Machines
- Cache-coherent Non-uniform memory machines
- Bulk-Synchronous Processors
- Message Passing Processors
- Collective Communication
- Partitioned Global Address Spaces
- Quantum Computing

**Instructor information**

Office FB 334, office hours TBA  email: prins@cs.unc.edu

**Requisites**

Graduate standing.

**Goals/student learning outcomes**

Determining parallel architectures, parallel algorithms, and parallel programming languages that offer best performance for a given problem.

**Course Materials**


**Grading**

Based on class participation and course project.

* classroom may change