

CS510 Concurrent Systems

Jonathan Walpole



Course Overview

About the Instructor

Instructor – Jonathan Walpole

Professor at PSU

Research Interests: Operating Systems,
Parallel and Distributed Systems

Teaching Assistant – Ted Cooper

PhD student doing research in concurrency

Course Overview

Based on ~30 research papers and articles

- Read them carefully BEFORE each class!

Class structure

- Formal lectures with in-class discussion
- Sequence of related programming assignments

Course web page

www.cs.pdx.edu/~walpole/class/cs510/winter2018/home.html

Brief Summary of Topics

Concurrency, race conditions and synchronization

Locking at application and kernel level

Scalable synchronization mechanisms

Non-blocking synchronization and lock-free algorithms

Hardware and compiler-level memory reordering

Memory Consistency Models (HW, C++11, Linux)

Concurrent memory reclamation techniques

Read Copy Update (RCU)

Relativistic programming using RCU

Transactional memory

Comparison of approaches

Grade Structure

In-class midterm exam - 50%

In-class final exam - 50%

Programming assignments:

- designed to reinforce key concepts
- exam papers will contain questions directly related to the assignments

Before Class 2

Study the class web page carefully:

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Start first programming assignment

Read paper for class 2