San José State University
Computer Science Department
CS259, Advanced Parallel Processing, Section 1, Fall 2020

Course and Contact Information

Instructor: Robert Chun

Office Location: MH 413

Telephone: (408) 924-5137

Email: Robert.Chun@sjsu.edu

Office Houedu

assignments (including the scheduled oral presentations) or exams are not accepted. All students must uphold academic honesty, especially for the required term paper, per university policy detailed at

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/

CS259 Fall 2020 Tentative Course Schedule

Lecture	Topic
1 - 3	Introduction, Motivation and Overview of Parallel Processing with an emphasis on the Micro- and Macro-Hardware Evolutionary Trends leading to Parallelism and the Software Challenges of Parallelism
4 - 6	Hardware Pipelining and Instruction-Level Parallelism (ILP)
7 - 8	Multi-Function Parallelism in Hardware
9	Data dependency analysis and control hazard analysis including RAW, WAR, WAW, and Branch Prediction
10	Limitations of Hardware-based, Software-transparent ILP
11 - 17	Software Challenges of Parallel Processing including Concurrent vs. Parallel Execution Models, Amdahl's Law, Deadlocks, Race Conditions, Semaphores
18	Models of Parallelism such as Shared Memory, Message Passing
19 - 21	Parallel Programming Paradigms including Unix Process Forking, PVM, MPI, OpenMP, CUDA, OpenCL, Hadoop Map-Reduce, GPGPU Computing, Toolsets for Parallel Program Software Development and Debugging.
Final Exam	Wednesday, May 13, 2020 at 1715-1930