Jordan University of Science and Technology

Faculty of Computer & Information Technology

Computer Science Department

CS475 Distributed Computer Systems

First Semester 2020-2021

Course Catalog
3 Credit Hours. Definition and characteristics of parallel computing, parallel algorithm, grid computing, autonomic computing, distributed computer systems, architectural and software models, remote procedure calls, distributed objects, processes and threads, logical clocks and ordering of events, distributed algorithms (e.g., mutual exclusion, consensus and election, termination detection), pervasive computing, distributed multimedia systems, distributed file systems, replication. Topics include distributed file systems, concurrency, and distributed process coordination. Introduction to network communication issues and special purpose systems such as real time systems, transaction processing systems, and client-server technology. Network Operating Systems; Distributed Operating Systems.

Text Book	
Title	An Introduction to Parallel Programming
Author(s)	Peter Pacheco
Edition	1st Edition
Short Name	Textbook
Other Information	https://www.cs.usfca.edu/~peter/ipp/

Course References

Short name	Book name	Author(s)	Edition	Other Information
The C Programming Language	The C Programming Language	Brian Kernighan and Dennis Ritchie	1st Edition	
Ref#1	Distributed Systems: Principles and Paradigms	Andrew S. Tanenbaum, Maarten van Steen	2nd Edition	
Ref#2	Introduction to Parallel Computing	Ananth Grama, George Karypis, Vipin Kumar, and Anshul Gupta,	2nd Edition	
Ref#3	Operating System Concepts	Avi Silberschatz, Peter Baer Galvin, and Greg Gagne,	10th Edition	

Instructor	
Name	**Dr. Ziad Al-Sharif**
Office Location	M2 L2, Engineering Building
Office Hours	
Email	zasharif@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 14:30 - 16:00 Room: منصة الكترونية

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
1733750	CS375 Operating Systems	Prerequisite / Study
1734511	CS451 Computer Architecture	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2, 3, 4	Review of C programming under Linux (i.e. Linux VM, WSL, C dynamic memory allocation, gcc, gdb, makefile, etc.)	
Weeks 5, 6	Introduction to parallel computing (Parallel Hardware and Parallel Software)	
Weeks 7, 8	Introduction to parallel programming design process (Parallel Programming Models)	
Weeks 9, 10, 11, 12	Parallel programming using a shared memory address space (Pthreads/OpenMP)	
Weeks 13, 14, 15, 16	Parallel programming using a distributed memory address space (MPI)	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Be able to identify the main C language features that support parallel programming [1SO5]	25%	Midterm Exam, Final Exam, Homework Assignments, Quizzes
Be able to describe the main parallel computing concepts, classes, limits, costs, memory architectures, and the major steps in the parallel solution design process. [1SO5]	25%	Midterm Exam, Final Exam, Homework Assignments, Quizzes
Be able to implement a simple parallel algorithm using Pthreads / OpenMP [1SO1, 1SO5]	25%	Final Exam, Homework Assignments, Quizzes, Final Project

Be able to implement a simple parallel algorithm using MPI [1SO1, 1SO5]	25%	Final Exam, Quizzes, Final Project

Relationship to Program Student Outcomes (Out of 100%)					
SO1	SO2	SO3	SO4	SO5	SO6
25				75	

Evaluation	
Assessment Tool	**Weight**
Midterm Exam	20%
Final Exam	50%
Homework Assignments	10%
Quizzes	10%
Final Project	10%

Policy	
Attendance	Attendance is very important for the course. In accordance with university policy, students missing more than 20% of total classes are subject to failure. Penalties may be assessed without regard to the student's performance. Attendance will be recorded at the beginning or end of each class
Exams	All exams will be CLOSE-BOOK; necessary algorithms/equations/relations will be supplied if required.

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