Course Outline

1. Document Information

Degree Program	Computer Science
Course Number	CS 520
Course Title	Advanced Topics in Parallel & Distributed Computing
Semester Hours	3
Course Coordinator	Khaled Ahmed
Revision Term	Fall 2020
Latest Revision	Spring 2021

2. Catalog Description

An advanced treatment of parallel and distributed computing; review of hardware and software considerations for parallel computation; development and analysis of parallel algorithms (with particular attention to the communication and synchronization costs associated with parallel algorithms); effect of granularity on performance; a comparison of the parallel and distributed programming paradigms including a detailed study of the central features of each approach; software systems for distributed computing including exposure to one or more distributed programming environments; the direction of parallel computing as suggested by recent, high level parallel languages; parallelizing serial programs; parallelizing compilers; future directions of parallel and distributed computing systems. The course will include a student project.

3. Textbooks

4. References

5. Course Learning Outcomes

6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6	7
Assessed	X	X	X				X

7. Prerequisites by Topic

CS 420.

8. Major Topics Covered in the Course

1. Review of hardware and software considerations for parallel computation.
2. Components of parallel processing.
3. Development and analysis of parallel algorithms.
4. Comparison of parallel and distributed programming paradigms.
5. Recent high level parallel languages.
6. Parallel compilers.
7. Future directions of parallel and distributed computing systems