CSC/CPE 469 – Distributed Systems

1. CSC/CPE 469 – Distributed Systems

2. **credit units** 4  **contact hours** 6

3. **Course Coordinator:** Maria Pantoja

4. **Textbook (or other required material):**
   Crosslisted as CSC/CPE 469.

5. a. **Course Description:**
   Foundations of distributed systems, distributed hash tables (peer-to-peer systems), failure
detectors, synchronization, election, inter-process communication, consensus, replication,
key-value stores, and measurements. 3 lectures, 1 laboratory. Crosslisted as CSC/CPE 469.
   
   b. **Prerequisite:** CSC/CPE 357.

   c. **Required/Elective/Selective Elective for CPE, CSC, EE, SE**
   
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6. a. **Course Learning Objectives**
   The student will be able to:
   - Analyze and design programmatic solutions to various constraints as they apply
to distributed systems.
   - Design and implement a distributed computational paradigm used in industry
cloud services.
   - Analyze performance, resilience, and scalability of a distributed system via a
real-world application.
   - Describe the distinction between synchronization and consistency.
   - Analyze trade-offs between message passing and distributed shared memory
systems.
   - Write descriptive reports with minimal grammatical errors and appropriate
scholarly conventions.
   - Compose an effective presentation of verbally discuss design decisions and
experimental results.
   - Compare and contrast engineering decisions made in real-world distributed
systems.
   
   b. **Level at which Student Outcomes are addressed**
   ("B" = Basic level, "I" = Intermediate level, "A" = Advanced level)
   
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7. Major Topics Covered: (number of lecture hours per)
   - Time and Ordering
   - MapReduce and Hadoop
   - Distributed Filesystems
   - Peer-to-Peer Systems
   - Distributed Hash Tables
   - Group Membership
   - Consensus
   - Mutual Exclusion
   - Replication Control
   - Distribute Databases
   - Key-Value Stores
   - Stream Processing and Graph Processing in Clouds
   - Measurements and Characteristics of Real Distributed Systems