**Course Number**: CS 420  
**Course Title**: Distributed Systems  
**Semester Hours**: 3  
**Course Coordinator**: Koushik Sinha

**Catalog Description**: A top-down approach addressing the issues to be resolved in the design of distributed systems. Concepts and existing approaches are described using a variety of methods including case studies, abstract models, algorithms and implementation exercises.

**Textbooks**


**References**


**Course Learning Outcomes**

- To learn the basic theoretical concepts of distributed systems  
- To develop practical skills in the area of distributed systems.

**Assessment of the Contribution to Student Outcomes**

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<th>Outcome</th>
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<th>6</th>
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**Prerequisites by Topic**

CS 335 with a grade of C or better or graduate standing.
Major Topics Covered in the Course

1. Introduction to distributed systems: characterization, models, networking and internetworking {5 classes}
2. Inter process communication: data representation, group communication, remote procedure calls, etc. {5 classes}
3. Operating system support: layers, protection, communication and invocation, OS architecture {3 classes}
4. Time and global states: events, process states, logical time, logical clocks, and global state {6 classes}
5. Coordination and agreement: mutual exclusion, elections, consensus, and related problems {6 classes}
6. Transaction and concurrency control {3 classes}
7. Distributed transactions: atomic commit protocols, distributed deadlocks, transaction recovery, etc. {4 classes}
8. Peer-to-peer systems: middleware, routing overlays, etc. {4 classes}
9. Distributed file systems {2 classes}
10. Security issues in distributed systems {2 classes}

NOTE: When course is taken as 500-level credit (CS 591 “Special Topics”), there will be additional requirements such as a research project.