### Dept Number
CS 540

### Course Title
Advanced Computer Networks

### Semester Hours
3

### Course Coordinator
Bidyut Gupta

### Catalog Description
Topics include routing protocols used in internet; data compression techniques; telecommunication systems - its services, architecture and protocols; high speed networks; routing protocols in mobile ad-hoc networks; and a detailed performance analysis of different window flow control and congestion control mechanisms using queuing theory.

### Textbooks

### References

### Course Learning Outcomes

### Assessment of the Contribution to Program Outcomes

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### Prerequisites by Topic
CS 440 with a grade of C or better, or consent of the instructor.
1. Queuing Theory
   M/M/1 queue
   State-dependent queues - M/M/N/N queue etc. {4 classes}

2. Performance analysis
   Data Link Layer protocols
   Flow Control and Congestion Control Mechanisms
   Virtual circuit model, Sliding window model {4 classes}

3. Queuing Networks
   Open Queuing Networks
   Closed Queuing Networks {3 classes}

4. Internet Routing
   Static Routing
   Dynamic routing
   Routing in The Global Internet
   Interior Gateway Protocols
   Exterior Gateway Protocols {8 classes}

5. Data Compression Techniques
   Run length encoding
   Arithmetic coding
   String matching Algorithms {4 classes}

6. Routing Protocols in Unidirectional Networks {2 classes}

7. High Speed Networks
   ATM
   High speed LANs {4 classes}

8. Introduction to Telecommunication Systems
   GSM - Services, Architecture, and Protocols {5 classes}

9. Routing Protocols in Mobile Ad-hoc Networks {4 classes}

10. Quality of Service {2 classes}

11. Term Paper, There may be some Lab(s) which is up to the instructor.