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Texts:  
James Kurose and Keith Ross  
Automated Network Management Systems  
Douglas Comer  

Course Description: This course provides a survey of contemporary topics in communication networks after covering the fundamentals of communication networks (e.g., protocol layering, error recovery, congestion control, computing shortest paths). In Spring 2021, these topics will include network management (and its automation), software defined networking, and multimedia networks.  

Prerequisite: Ideally, an introductory course in communication networks. However, it is not necessary as we will cover the fundamentals of communication networks.  

Class Hours: Mondays and Wednesdays 4:30PM to 5:50PM, Online  

Office Hours: Mondays and Wednesdays 10:30AM to 12PM, Online  

Course Outline:  
Week 1: Introduction and Course Overview  
Week 2: Network Performance Measures and Protocol Layering  
Week 3: Transport Layer Design Principles: TCP, and UDP  
Week 4: Error Recovery and its Implementation in TCP  
Weeks 4-5: Congestion Control and its Implementation in TCP  
Week 5: Network Layer Design Principles: IP, and Router Architecture  
Week 6-7: Routing Algorithms: RIP, OSPF, and BGP  
Week 7: Software-Defined Networking (SDN)  
Week 8: Midterm Exam  
Weeks 9-10: Network Management: FCAPS model  
Week 11: Link Layer Design Principles: Error Detection/Correction, and Ethernet  
Weeks 11-12: Media Access Control Protocols: Ethernet CSMA/CD  
Weeks 12-13: Fundamentals of Data Analytics (incl. clustering and outlier detection)  
Week 13: Network Data Analytics (Packet, Flow, Interface Stats)  
Week 14: Protocols for Delivering Video over Packet Switched Networks  
Week 14: Providing Delay and Bandwidth Guarantees  
Week 15: Rate Limiting Devices, Link Sharing Packet Schedulers
Grading:
Course Portfolio/Participation 10%
Assignments/Quizzes 30%
Project 20%
Midterm 20%
Final 20%

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