

CIS 9590 Ad Hoc Networks

● Course Description:

Ad Hoc Networks. Credit 3. A comprehensive approach to fundamentals of ad hoc networks including media access protocols, routing protocols, implementation and communication performance. Prerequisite: Discrete Mathematics and Introduction to Data Communications.

● Textbooks:

J. Wu, Handbook on Theoretical and Algorithmic Aspects of Sensor, Ad Hoc Wireless, and Peer-to-Peer Networks, CRC Press, 2005.

C. Siva Ram Murthy and B. S. Manoj, Ad Hoc Wireless Networks: Architectures and Protocols, Prentice Hall, 2004.

Classnotes and handouts

● References:

S. Basagni, M. Conti, S. Giordano, and I. Stojmenovic, Mobile Ad Hoc Networking, IEEE Press & Wiley Inter-Science, 2004

M. Ilyas, The Handbook of Ad Hoc Wireless Networks, CRC Press, 2002.

I. Stojmenovic, Handbook of Wireless Networks and Mobile Computing, John Wiley & Sons, 2002

C.E. Perkins, Ad Hoc Networking, Addison Wesley, 2001.

D. P. Agrawal and Q.-A. Zeng, Introduction to Wireless and Mobile Systems, Thomson Brooks/Cole, 2003.

W. Stallings, Wireless Communications and Networking, Prentice Hall, 2002.

● Instructor:

Jie Wu, Chair Professor of Computer and Information Sciences, Temple University.

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● **Office Hours:**

Monday: 3:00 pm - 4:50 pm

● **Goals:**

An understanding of basic of the ad hoc wireless networking. Covers media access, routing, data management, power optimization, transport protocol, and much more. Current and future developments in the field.

● **Prerequisites by Topic:**

1. Basic graph theory
2. Fundamentals of computer networks

● **Topics:**

1. Introduction to Wireless Networks
2. Ad Hoc Wireless Networks and Their Origins
3. Topics in Infrastructured Networks (cellular architecture)
 - Handoffs
 - Location Management (Mobile IP)
 - Channel Assignment
4. Topics in Infrastructurless Networks (MANETs)
 - Wireless Media Access Protocols
 - Ad Hoc Routing Protocols
 - Multicasting and Broadcasting
 - Reliability and QoS
 - Power Optimization
 - Security
 - Network Coding
5. Applications
 - Sensor Networks and Indoor Wireless Environments
 - Pervasive Computing
 - Peer-to-Peer Networks
 - Social Networks
6. Sample On-going Projects