

# INFSCI 1072/TELCOM 2700: Introduction to Wireless Networks

## Fall 2016: Syllabus

The objective of this course is to provide an understanding of various wireless networking technologies ranging from cellular networks to wireless personal area networks and how they differ from wired networks (e.g., signal transmission, interference, mobility, etc.). The course will cover the architecture and protocols of cellular networks (1G, 2G, 3G and LTE), IEEE 802.11 networks, and IEEE 802.15 networks. Deployment issues will be discussed. Physical layer details are provided as necessary, but will not be the primary focus. There will be a brief treatment of positioning technologies and location services.

### **Prerequisites (concepts):**

Digital modulation, some calculus, and probability

### **Contact Information:**

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Course webpage: <http://www.sis.pitt.edu/prashk/inf1072>

Office hours: Tuesdays and Thursdays after class or Thursdays: 2:30 a.m. – 3.30 p.m. or by appointment

GSA: Maryam Karimi (mak322 AT pitt DOT edu)

### **Textbooks:**

**No Textbook is Required:** Lectures will be drawn from several sources (books, articles, papers) as most available texts do not cover all of the course material

**Recommended Textbook:** Cory Beard and William Stallings, Wireless Communication Networks and Systems, Pearson 2016

### **References:**

- Principles of Wireless Access and Localization, K. Pahlavan and P. Krishnamurthy, John Wiley and Sons
- Mobile Communications, 2nd Ed. - Jochen Schiller, Addison Wesley, 2004
- Wireless Communications, Andreas Molisch, John Wiley and Sons
- Wireless Communications and Networking, Jon W. Mark and W. Zhuang, Pearson Ed.
- WCDMA for UMTS, H. Holma and A. Toskala, John Wiley and Sons
- Papers from magazines and journals

**Grading:**

Homework 15%, Quiz 15%, Midterm 20%, Final 30%, Project 20%

**Policies:**

- All work must be the student's own unless collaboration is explicitly permitted
- Late assignments will not be accepted unless there are exceptional circumstances.
- Homework is due ONE week after it is assigned unless otherwise mentioned.
  
- Homework will be assigned every week unless otherwise mentioned.
- Check for homework on the webpage even if it is not explicitly mentioned in class
- Check for lab instructions and changes on the webpage regularly
- Keep checking the webpage for other changes regularly
- All written work must be legible and clear to receive credit. Vagueness in your work leading to misinterpretation is not a valid reason for credit.

**Course Outline:**

This schedule is only a guideline and is subject to change depending on the progression of the course.

Week 1: Introduction to the class

Week 2: Overview of Wireless Systems, Channels, Bandwidth, and Spectrum Efficiency

Weeks 3-4: Basics of transmission, Antennas, dB scale

Week 5: Radio Propagation 1 – Large Scale Fading

Week 6: Radio Propagation 2 – Small Scale Fading

Week 7: Spread Spectrum and OFDM

Week 8: Midterm exam;

Week 9: Medium Access

Week 10: Network Deployment and Traffic Engineering

Week 11: Radio Resource and Power Management

Week 12: Mobility Management

Week 13: WiFi in detail

Week 14: LTE in detail

Week 15: Final Exam