



# CSC 8260: Wireless Networking and Cyber-Physical Systems

—Today's research, tomorrow's infrastructure

Winter 2012

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**Class ref number:** 25060

**Class timings:** MW 3:00pm-4:20pm

**Class webpage:** <http://www.cs.wayne.edu/~hzhang/courses/8260/8260.html>

## Overview

Seamlessly integrating sensing, networking, and computation with the control of physical devices and processes, cyber-physical systems (CPS) are expected to transform how we interact with and manipulate the physical world. Accordingly, CPS will have far-reaching impact on science and engineering, and are critical to a wide range of applications such as smart energy grid, smart transportation, and smart health. One basic enabler of CPS is pervasive wireless networking that builds the coordination foundation for sensing, computing, and control. In supporting mission-critical, real-time, and closed loop sensing and control, CPS wireless networks represent a significant departure from traditional wireless and sensor networks, and it is critical to ensure controllable, predictable messaging quality in CPS.

This course is designed for students who are interested in cyber-physical systems in general and CPS wireless networking in particular. We will examine a wide range of topics including CPS applications (e.g., smart energy grid, smart transportation, and smart health), fundamentals of wireless communication (e.g., wireless channel, signal propagation, modulation, link models), wireless networking in a local region (e.g., MAC), large scale wireless networking (e.g., routing, transport), real-time wireless networking, predictable wireless networking in an uncertain world (e.g., wireless system and environmental dynamics, jamming), and wireless networked control. This course is expected to prepare students for innovative development and research in wireless cyber-physical systems.

## Prerequisites

Basic knowledge of computer networks (e.g., materials covered in CSC6290 or equivalent), elementary probability theory and statistics. Or consent of instructor.

*For more information, please visit the class webpage or contact Dr. Hongwei Zhang (hongwei At wayne.edu).*

