Wireless Sensor Networks

Course Description

This is a graduate level course on wireless sensor networks; one of the fastest developing areas in computer science and engineering. The focus of this course is on the design of optimized architectures and protocols for such unique networks. Topics include the design principles of wireless sensor networks, energy management, MAC protocols, naming and addressing, localization, routing protocols, applications of wireless sensor networks, and associated challenges and measures.

Learning Objectives

The course is designed to achieve the following objectives:

- Demonstrate an understanding of the fundamentals of wireless sensor networks.
- Understand the design principles of wireless sensor networks.
- Understand standard communication algorithms including routing and naming protocols.
- Familiarize with the wide range of WSN applications.
- Understand major architectural and protocol challenges and solutions.
- Understand major vulnerabilities and counter measures.
- Familiarize with state-of-the-art WSN research.

Major Course Requirements

- 2 Exams → 50%; Tentatively Exam 1 on June 14th and Exam 2 on June 28th
- Presentations, Labs, and Assignments → 35%; Tentatively Presentations on June 11th, 18th, 25th
- Quizzes and Class Participation → 15%

Recommended Readings

- Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, and Leonidas Guibas,
Course Website


Course Policies

Submitted Work

• Assignments are due at the beginning of the class on the due date. Late submissions will be graded at 50% of the maximum score. Under no circumstances, submissions will be accepted after 24 hours of the due date.
• Assignments must be submitted in a neat computer-generated format. Handwritten submissions will not be accepted.
• Assignments can only be submitted in class; email submissions will be discarded unless instructed otherwise. In case of late submissions, please stop by my office. If I am not available, ask the secretary to date and time your submission and put it in my mailbox.
• Graded work can only be discussed after 48 hours and no later than one week of releasing the scores.
• In case of programming assignments, submissions that do not compile will receive no credit.
• Start working on your assignments early; last day questions that show carelessness will not be responded to.
• It is always recommended to keep your graded work.

Exams and Quizzes

• Exams and quizzes are NOT open-book unless instructed otherwise.
• Not all quizzes times will be announced; pop-up quizzes are likely.
• NO makeup exams or quizzes will be allowed unless I have agreed prior to the exam or quiz time and been provided with official supporting documents.

Class Participation

Class discussions and information provided in class are considered regular course material; it is your responsibility to take appropriate notes. You are expected to attend lectures and actively participate in class discussions. I will be frequently taking attendance. You are also required to turn off your cell phone and/or pager in class and pay attention to class discussions. Use of laptops and other electronic devices is restricted to taking notes. Unethical behavior will result in final grade deduction or an automatic F.

Academic Honesty

You are required to abide by the university academic honesty code. All submissions must reflect the student’s own work; no collaboration will be allowed unless instructed otherwise. You must properly acknowledge all materials that you may use. Plagiarism will result in no credit and/or an automatic F. It is your responsibility to
protect your own work; all parties participating in copying, cheating and/or academic dishonesty will be treated indifferently. Academic dishonesty cases will be reported to the appropriate university authorities.

Classroom Environment
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Grade Appeals
As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disabilities Accommodations
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101. If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Announcements
Announcements will be made available in class, on course web page, and/or through email. It is your responsibility to regularly check for announcements.

Syllabus
This syllabus provides a framework for the course format and policies. Changes and/or additions to this syllabus may be made at the instructor’s discretion. Students will be notified with changes.
**Tentative Course Outline**

**Week 1**
- Overview of Basic Networking Concepts
- Ad Hoc Networking
- WSN Single Node Architecture
- WSN Architecture

**Week 2**
- WSN Medium Access Control (MAC) Protocols
- Link Layer Protocols

**Week 3**
- Naming and Addressing
- Localization and Positioning

**Week 4**
- Topology Control
- Routing Protocols

**Week 5**
- Transport Protocols