

Wireless Sensor Networks

ELC 659/ELC 724

Fall 2017

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Office Hours: Sunday 4:00-5:00 (or by e-mail appointment)

Course Webpage: eece.cu.edu.eg/~akhattab/elc659_724.html

Credit Hours: 3

Course Overview: This course covers the challenges and the latest research results related to the design and management of wireless sensor networks (WSNs). WSNs have recently gained tremendous popularity due to the wide range of applications they can be used for such as disaster management, military, building and road monitoring, health care, etc. WSNs are infrastructures wireless networks that are significantly constrained in the amount of available resources such as energy, storage and computation. Such constraints make the design and operation of sensor networks considerably different from contemporary wireless networks, and necessitate the development of resource conscious protocols and management techniques. This course covers the following topics:

- Sensor node architecture.
- WSN network architecture and deployment strategies.
- Medium access control (MAC) in WSN.
- Routing protocols in WSN.
- Data centric and content-based networking.

Textbook: Holger Karl, Andreas Willig, "Protocols and Architectures for Wireless Sensor Networks," Wiley, May 2005.

Other References: Jun Zheng and Abbas Jamalipour (Eds.), "Wireless Sensor Networks: A Networking Perspective," Institute of Electrical and Electronics Engineers 2009.

Note: Lecture notes are the primary reference.

Course Outcomes:

After completing this course the students should:

1. Understand and explain common wireless sensor node architectures.
2. Be able to carry out simple analysis and planning of WSNs.
3. Demonstrate knowledge of MAC protocols developed for WSN.
4. Demonstrate knowledge of routing protocols developed for WSN.
5. Understand and explain mobile data-centric networking principles.
6. Be familiar with WSN standards.

Grading System:

Final Exam	60 %
Research Report	20 %
Project/Midterm	20 %

Classroom Policy:

No chatting or use of mobile phones is allowed during lectures.