KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
COMPUTER ENGINEERING DEPARTMENT

COE 549: Wireless Sensor Networks
Term 141 (Fall 2014)

Course Syllabus

Instructor: Dr. Abdulaziz Barnawi
Lecture: M.W.: 8:00-9:15 PM
Class location: Bldg 24 Room 104
Office hours: U.T.: 11:00-12:00 AM (in 59/2065), M.: 3:00-4:00 PM (in 22/407-4), or by appointment
Office-Tel: 1038
Web site: http://faculty.kfupm.edu.sa/coe/barnawi
e-mail: Only Blackborad's email will be used for correspondence during this course.

Course Description:
Advanced development in wireless communication technologies as well as an increasing interest in applications that involve environment monitoring and control (e.g. wildfire and habitat monitoring, structural control, health care and target tracking in military systems) has lead to the emergence of a new kind of wireless networks, namely wireless sensor networks The objective of this course is to introduce students to the state of the art in wireless sensor actuator networks. Lectures will emphasize aspects of energy management, MAC protocols, routing and data aggregation, localization. Case studies from existing applications will be used.

Prerequisite: Undergraduate level in computer networking and data communication

Textbook:
There is no specific textbook assigned for this course. The main reference in preparing for lecture slides is:

- ***Protocols and Architectures for Wireless Sensor Networks*** by Holger Karl and Andreas Willig, Wiley, ISBN: 0-470-09510-5, June 2005

The following books are also *recommended* as a supporting reading material:

- ***Wireless Sensor Networks***, by Ian F. Akyildiz and Mehmet Can Vuran, John Wiley & Sons 2010, ISBN 978-0-470-03601-3
- ***Wireless Sensor Networks***, by Suraiya Tarannum, ISBN 978-953-307-325-5, Hardcover, 342 pages, Publisher: InTech.
- ***Ad hoc Wireless Networks – Architecture and Protocols,*** by C. Siva Ram Murthy and B. S. Manoj, , Prentice Hall, 2004, ISBN – 013-147-023x.

Tentative Grading Policy:

Class participation	5%	
Reading assignments/presentations	15%	
Project	50%	
Mid-Term	10%	(October 29, 2014 – tentative)
Final	20%	

Important Policies:

- All KFUPM regulations and standards will be enforced. Attendance will be checked each class.
- You have 48 hours to object to the grade of a presentation or assignments from the end of the class time in which the graded submissions have been distributed back.
- Check the course webpage and Blackboard for updates, emails and announcements.
- Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated.

Expected Learning Outcomes

Upon successful completion of this course:

1. Students will be introduced to some existing applications of wireless sensor actuator networks.
2. Students will be introduced to elements of network protocol design and will learn to apply these principles in the context of wireless sensor networks
3. Students will learn the various hardware, software platforms that exist for sensor networks
4. Students will get an overview of the various protocols for MAC layer, routing, time synchronization, aggregation.
5. Students will read and present seminal papers on various issues in sensor networks, opening a path to course project as well as possible research in this area.
6. Students will understand what research problems sensor networks pose in disciplines.

Tentative Class and Lab Schedule

Week	Lecture	Date	Topic
1	1	September 1, 2014	Logistics and introduction
	2	September 3, 2014	Sensor node architecture
2	3	September 8, 2014	Power and Energy Management
	4	September 10, 2014	Basics of Wireless Communications
3	5	September 15, 2014	Sensor Network Architecture
	6	September 17, 2014	*Reading Assignment 1 (A1)*
4	7	September 23, 2014	**National Day – No Class**
	8	September 24, 2014	*Reading Assignment 2 (A2)*
Hajj Holiday 28 September-9 October, 2014			
5	9	October 13, 2014	Network Bootstrapping and Clustering
	10	October 15, 2014	*Reading Assignment 3 (A3)* / ***Project proposal submission starts***
6	11	October 20, 2014	MAC Protocols for Sensor Networks
	12	October 22, 2014	MAC Protocols for Sensor Networks (cont.)
7	13	October 27, 2014	MAC Protocols for Sensor Networks (cont.)
	14	October 29, 2014	Mid-term Exam
8	15	November 3, 2014	Routing and Data Aggregation ***/ Project proposal submission deadline***
	16	November 5, 2014	Routing and Data Aggregation (cont.)
9	17	November 10, 2014	Project proposal presentations
	18	November 12, 2014	*Reading Assignment 4 (A4)*
10	19	November 17, 2014	Reading Assignment 5 *(A5)*
	20	November 19, 2014	Reading Assignment 6 *(A6)*
11	21	November 24, 2014	*Invited Speaker*
	22	November 26, 2014	Selected topics
12	23	December 1, 2014	Selected topics
	24	December 3, 2014	Selected topics
13	25	December 8, 2014	*Invited Speaker*
	26	December 10, 2014	Reading Assignment 7 *(A7)*
14	27	December 15, 2014	Reading Assignment 8 *(A8)*
	28	December 17, 2014	Reading Assignment 9 *(A9)*
15	29	December 22, 2014	Project Presentations
	30	December 24, 2014	Project Presentations