Introduction to Wireless Sensor Networks
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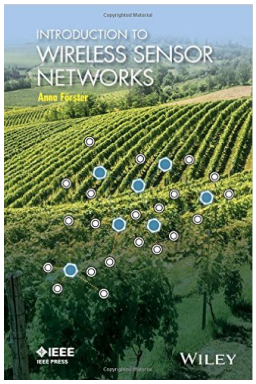

SAMPLE CURRICCULUM
for a 14-week, 2 hours per week university-level course

This is a sample curriculum for a university-level course, either at an advanced undergraduate level or graduate level. It requires students to be able to program in C. Networking or microcontroller experience is not required, even if an advantage. Each student group needs to have 2 sensor nodes, two USB cables for debugging/programming and laptops to bring to class with installed Contiki image on them.

The schedule is broken up into weeks, with each week having one lecture and/or tutorial and one homework assignment. Towards the middle of the semester, assignments develop into a project. Assignments and projects are better suited for working in small groups (2 students).

It is very important to design the class to be interactive - it is better to leave out details for the students to read at home and make instead in-class small assignments and tutorials.

In this curriculum, it is assumed that we do not teach everything from the individual chapters to the students. Instead, we select the most important parts. If the course ha more time (3+ hours), we can teach them also all details and discuss more exercises. It can be also modified to have no homework at all and work only inn class. However, this requires at least 3 hours per week, better 4.

I would be happy to hear whether you used this curriculum and how exactly. I am also happy to discuss your particular arrangements and restrictions and work out together a tailored curriculum.

Bremen, August 2016.

Weeks	Lecture	In-class assignment / tutorial	Homework	Reading
Week 1	What are wireless sensor networks? (1 hour)	Installation of Contiki on students laptops, run a small Cooja simulation (1 hour)	Find online an exciting application of wireless sensor networks and report in the next class	Chapter 1, online slides of Contiki
Week 2	Anatomy of a sensor node	Students report about their homework	Finalize Contiki installation	Chapter 2, sensor node specifications
Week 3	Radio communications	Discuss Exercise 3.5	Run Contiki tutorial iii (from book site)	Chapter 3
Week 4	Link Management	Discuss Exercise 4.6	Exercise 4.1	Chapter 4
Week 5	Multi-Hop Communications (up to 5.3.1)	Discuss Exercise 5.2	Exercise 5.3	Chapter 5, up to 5.3.1
Week 6	Multi-Hop Communications (from 5.3.2)	Discuss Exercise 5.6 and/or Exercise 5.4	Run CTP on sensor nodes with all students together.	Chapter 5, from 5.3.2
Week 7	Time synchronization	Implement a simple program, which blinks every 10 seconds. Start two nodes at the same time. How long does it take before they start blinking differently?	Exercise 7.3	Chapter 7
Week 8	Sensing techniques	Exercise 9.1	Exercise 9.3	Chapter 9
Week 9	Project start	Define together a small project, e.g. sensing the temperature in several rooms or humidity on a field (project can be one for all students of one per student group)	Make a top-down analysis of your project	Chapter 10, up to 10.5
Week 10	Project work	Discuss project results	Define the bottom-up implementation process	Chapter 10, from 10.6
Week 11	Project work	Discuss project results	Project implementation	-
Week 12	Project work	Discuss project results	Project lab test	-
Week 13	Project work	Discuss project results	Project field test	-
Week 14	In-class presentation of projects (IDEA: let the students vote for the best project and give a small prize and/or certificate to that best project)			