UNIVERSITY OF LATVIA
Department of Computer Science
WIRELESS SENSOR NETWORKS
(DatZ3070, Fall 2007)
Course Syllabus

ABSTRACT

Wireless sensor networks (WSN) are composed from a few to several thousand sensor nodes. The nodes have sensors or actuators, can perform computation, and transmit or receive data wirelessly. The resourses of the sensor nodes are very restricted. Often WSN are deployed in hard to access locations, such as on a slope of a volcanoe. The potential benefit of WSN is immense, ranging from healthcare applications to ecology research on remote islands.

GOALS AND OBJECTIVES

The students will be introduced to wireless sensor network design and applications. They will learn programming for WSN in NesC programming language and TinyOS operating system

REQUIREMENTS

Requirements for successful completion of the course:

1. Turn in all assignments. The assignments are small projects involving programming in NesC and TinyOS, which is component oriented environment for the wireless sensor networks
2. There will be one midterm and one final exam.
3. Present a group project (usually 2-3 students per group). The project should offer a solution of a problem or an application in the WSN domain. The presentation should be five minutes, including three slides at most. Prepare a poster describing the project.
4. Attend and participate at least in 50% of the lectures. The lectures may include topics not covered in literature, but included in the exams.

The final grade will be assigned as follows:

10% - participation in the class discussions
15% - assignments
20% - midterm exam
25% - final exam
30% - course project

COURSE PLAN

No.	*Topic*	*Planned amount in hours*
1.	**Introduction and applications of wireless sensor**	2

	networks	
2.	**Wireless communication systems and protocols**	2
3.	**Realities of wireless communication**	2
4.	**WSN hardware survey and the available resources**	2
5.	**Component oriented programming. TinyOS operating system**	2
6.	**MAC protocols**	2
7.	**Routing**	2
8.	**Clock synchronization**	2
9.	**Localization**	2
10.	**Power management**	2
11.	**Data services and databases in WSN**	2
12.	**Programming abstractions**	2
13.	**Security and privacy**	2
14.	**Case study for a wireless sensor netwok**	2
15.	**Self-healing, energy harvesting**	2
16.	**Summary and future perspectives**	2

LITERATURE

Textbooks

- F. Zhao and L. Guibas, Wireless Sensor Networks, Morgan Kaufmann, San Francisco, 2004.

Further reading

- Relevant contemporary publications and conference papers will be presented along the course

Periodicals, internet resources and other sources

- www.tinyos.net
- www.openwsn.com
- http://www.eecs.harvard.edu/~mdw/course/cs263/