This seminar covers recent leading edge topics in wireless sensor networks organized into 7 topic areas: hardware, architecture, OS, communication, sensing, security and pervasive computing. The main course goals are to (i) understand some of the latest key results in wireless sensor networks, (ii) identify open research problems, and (iii) attempt to generate novel research ideas. Each of the topic areas centers on a theme for that area. There are also overarching themes including architectures and commonalities for future sensor networks, and integrating sensor networks and pervasive computing.

Prerequisites
Students should have graduate level knowledge of computer science. Previous knowledge of sensor networks is recommended, or a student may perform extra background reading for each topic area to better understand the papers. A background reading list and pointers to other materials is provided for such students.

Course Requirements
All students will make one or more presentations. The presentations must follow guidelines which will be distributed in class. Presentations will be graded. Participation in class discussion will also be part of the grade. Students will write short 1-paragraph summaries of all the papers on the reading list. The students will also complete an individual or team-based final project. The final projects will mimic a good conference paper.

Research Papers
Hardware - 4 LECTURES


- Energy Scavenging

- **Sensors**


- **BACKGROUND:** MICA2, MICAZ, XSM, TELOS MOTES

- **BACKGROUND:** See also slides at http://www.cs.virginia.edu/cs651-wsn/Lecture.htm and click on Introduction.ppt

**Architecture - 5 LECTURES**


- L. Gerod, K. Jamieson, Y. Mei, R. Newton, S. Rost, A. Thiagarajan, H. Balakrishnan and S. Madded, WaveScope: A Signal-Oriented Data Stream Management System, ...
MetroSense

- A. Campbell, S. Eisenman, N. Lane, E. Miluzzo, R. Peterson, People Centric Urban Sensing, ...


Operating Systems - 3 LECTURES


- BACKGROUND: TinyOS - see Berkeley website

- BACKGROUND: See also slides at http://www.cs.virginia.edu/cs651-wsn/Lecture.htm and click on nesC.ppt

Communication - 3 LECTURES


• BACKGROUND: See also slides at http://www.cs.virginia.edu/cs651-wsn/Lecture.htm and click on MACLayer.ppt and RadioRealities.ppt

Sensing - 3 LECTURES


• V. Bychkovskiy, S. Megerian, D. Estrin and M. Potkonjak, A Collaborative Approach to In-Place Sensor Calibration, IPSN 2003.


Security - 5 LECTURES


Pervasive Computing - 2 LECTURES
These lectures will be organized later and there may be different papers assigned. The list below are examples.

- BACKGROUND: Service Oriented Architectures
- BACKGROUND: Web Services