ECGR 6189/8189 – Wireless Sensor Networks
University of North Carolina at Charlotte
Fall 2016

INSTRUCTOR:  Dr. Asis Nasipuri, Department of Electrical & Computer Engineering
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COURSE OBJECTIVES:  The purpose of this course is to provide an overview of the principles of
operation, design challenges, and research issues on wireless sensor networks.  The course involves
hands-on tutorials and design projects with programmable wireless sensors.

PREREQUISITES:  Requires knowledge in: (a) Computer networking fundamentals, (b) probability
and random variables, (c) C/C++ programming.

TEXT:  There is no prescribed textbook for the course. Course material will consist of
research papers as cited by the instructor.

REFERENCES:  The following textbooks may be useful, although not required for the course:

TOPICS:  The course will cover the following topics:
• Introduction: technology, scope, applications.
• Multihop wireless networks: wireless transmission basics, wireless networking challenges – medium access, routing.
• MAC in sensor networks: assumptions, examples of sensor MAC, IEEE 802.15.4
• Routing in sensor networks: energy aware routing, geographic routing, attribute based routing
• Localization and time synchronization in sensor networks
• Energy harvesting: scope, challenges, examples.
• Current issues

GRADING:  Your grade will be based on your performance on homework and paper reading
assignments, two midterm exams, one presentation and programming based research projects. Presentation and research topics must
be approved by instructor. Students will be evaluated on the following:
Homework assignments and paper critiques=20%,
Mid-term examinations (two) =40%,
Seminar presentation=10%,
Software projects=30%
(Presentations and software projects will be done in groups of two students.)
REQUIREMENTS: The course is research oriented. You will be learning to search and read papers, critique them, and present your own ideas.

- Various papers will be cited as reading material on different topics.
- You should be comfortable with C/C++ programming as projects need to be done using MICAz or mica2 motes using nesC, which is a code similar to C. Tutorials and samples of code will be provided by the instructor.
- Although presentations and research projects will be done in groups of three students, each student will have an independent component in it. This has to be made clear by each group while planning the presentation or research project.
- Guidelines, information, and sample code (where applicable) will be provided through the course web site for presentations and projects.
- Try to be productive. Your ideas may be extended to theses or publications.