Comp Principles of Mobile Embedded Sys - CPE/EE-556-A
School of Engineering and Science

Classroom Location: Main Campus
Instructor: Dr. Yingying (Jennifer) Chen
Contact Info: yingying.chen@stevens.edu, Burchard 209
Office Hours: Tuesday 11AM-12PM or by appointment
Course Web Address: Canvas
Prerequisite(s):   some knowledge of C ++ or Java
Corequisite(s):   None
Cross-listed with: None

COURSE DESCRIPTION
The scope of this course is to introduce students to understand applied computing principles in emerging mobile technologies and applications for embedded systems. This course will focus on emerging computing paradigms in the areas of context-aware pervasive systems, spatiotemporal access control with distributed software agents, vehicular computing, information systems cryptography, trust and privacy in mobile environments, location-aware services, RFID systems, wireless medical networks, and urban sensing. The students will be proficient with computing methods by studying the programming aspects in wireless sensor networks and learn how to program with sensor nodes, Raspberry Pi or smartphones.

LEARNING OBJECTIVES
Main Topics:
• Principles of real-time embedded systems
• Wireless sensor networks and urban sensing applications
• Wireless localization and location-based services (LBS)

• Methodology of distributed systems and access control computing paradigm
• Vehicular networks computing
• Computer and network security
• Privacy techniques
• RFID systems
• Mobile healthcare systems

After successful completion of this course, students will be able to:
• Understand applied computing principles in emerging mobile technologies and applications for embedded systems
• Read and discuss interesting recent work in several areas of emerging computing paradigms
• Be proficient with computing methods by studying the programming aspects in sensor networks and learn how to program with sensor nodes

• Understand emerging wireless and mobile technologies
  ◦ How to determine what is important in the new technologies and research:
  ◦ What is the trend
  ◦ What are the challenges
  ◦ What are the weaknesses

FORMAT AND STRUCTURE

Course based on a mixture of lectures, presentation of research papers, and discussions. Each student is expected to present one scientific paper, and write a term paper as the midterm exam. Additionally, a team (3 or 4 students) project involving sensor network programming would be carried out. Team members are expected to present their team project and show the demo. Furthermore, each student needs to actively participate in asking question and involve in the class discussion.

COURSE MATERIALS

Textbook(s):

• Fundamentals of Mobile and Pervasive Computing by Frank Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, and Loren Schwiebert, Publisher: McGraw-Hill Education, 2005, ISBN-10:0071412379, ISBN-13: 978-0071412377.
• Context-Aware Pervasive Systems: Architectures for a New Breed of Applications by Seng Loke, Publisher: AUERBACH, 1st edition (December 7, 2006), ISBN-10: 0849372550, ISBN-13:978-0849372551.
• Handbook of Research on Ubiquitous Computing Technology for Real Time Enterprises by Max Muhlhauser & Iryna Gurevych, 2008.
• Securing Emerging Wireless Systems, Yingying Chen, Wenyuan Xu, Wade Trappe, Yanyong Zhang, ISBN:978-0-387-88490-5,Springer, 2009.

Other Readings:　　Available online through Canvas course shell

Materials:　　Will be distributed in the class (e.g., Android phones/sensor nodes)

COURSE REQUIREMENTS

Presentations　(treat it as your homework)
  ◦ No regular weekly or bi-weekly homework assignments
  ◦ Each student expects to present one paper during the whole semester – treat it as your homework for the whole semester
  ◦ Papers are from different topics
  ◦ Read and prepare slides before the class
  ◦ Lead the discussion and prepare questions
Midterm
  ◦ The same paper that is presented by the student
Online Discussion
  ◦ Discussion about the topics covered in the course materials
Final Project
  ◦ Participate in 1 project (team project) – 3~4 students form a team.
  ◦ Final exam: project presentation
Final Project Presentation
  ◦ Final exam: Team members present their final project and show the demo.
Class Participation
  ◦ Active participation and discussion in the class

GRADING PROCEDURES

Grades will be based on:

Class Participation	(15%)
Online discussion	(10%)
Individual Presentation	(25%)
Midterm	(25%)
Final Project & Team Presentation	(25%)

ACADEMIC INTEGRITY

Undergraduate Honor System

Enrollment into the undergraduate class of Stevens Institute of Technology signifies a student's commitment to the Honor System. Accordingly, the provisions of the Stevens Honor System apply to all undergraduate students in coursework and Honor Board proceedings. It is the responsibility of each student to become acquainted with and to uphold the ideals set forth in the Honor System Constitution. More information about the Honor System including the constitution, bylaws, investigative procedures, and the penalty matrix can be found online at http://web.stevens.edu/honor/

The following pledge shall be written in full and signed by every student on all submitted work (including, but not limited to, homework, projects, lab reports, code, quizzes and exams) that is assigned by the course instructor. No work shall be graded unless the pledge is written in full and signed.

"*I pledge my honor that I have abided by the Stevens Honor System.*"

Reporting Honor System Violations
Students who believe a violation of the Honor System has been committed should report it within ten business days of the suspected violation. Students have the option to remain anonymous and can report violations online at www.stevens.edu/honor.

Graduate Student Code of Academic Integrity

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at www.stevens.edu/provost/graduate-academics.

Special Provisions for Undergraduate Students in 500-level Courses

The general provisions of the Stevens Honor System do not apply fully to graduate courses, 500 level or otherwise. Any student who wishes to report an undergraduate for a violation in a 500-level course shall submit the report to the Honor Board following the protocol for undergraduate courses, and an investigation will be conducted following the same process for an appeal on false accusation described in Section 8.04 of the Bylaws of the Honor System. Any student who wishes to report a graduate student may submit the report to the Dean of Graduate Academics or to the Honor Board, who will refer the report to the Dean. The Honor Board Chairman will give the Dean of Graduate Academics weekly

updates on the progress of any casework relating to 500-level courses. For more information about the scope, penalties, and procedures pertaining to undergraduate students in 500-level courses, see Section 9 of the [Bylaws of the Honor System](#) document, located on the Honor Board website.

EXAM ROOM CONDITIONS

> **None**

LEARNING ACCOMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. Student Counseling and Disability Services works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, and psychiatric disorders in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from SCDS staff. The SCDS staff will facilitate the provision of accommodations on a case-by-case basis. These academic accommodations are provided at no cost to the student.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the office of Student Counseling, Psychological & Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/sit/counseling/disability-services. If you have any questions please contact:
> Lauren Poleyeff, Psy.M., LCSW - Diability Services Coordinator and Staff Clinician in Student Counseling and Disability Services at Stevens Institute of Technology at lpoleyef@stevens.edu or by phone (201) 216-8728.

INCLUSIVITY STATEMENT

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in education and innovation. Our community represents a rich variety of backgrounds, experiences, demographics and perspectives and Stevens is committed to fostering a learning environment where every individual is respected and engaged. To facilitate a dynamic and inclusive educational experience, we ask all members of the community to:
- be open to the perspectives of others
- appreciate the uniqueness their colleagues
- take advantage of the opportunity to learn from each other
- exchange experiences, values and beliefs
- communicate in a respectful manner
- be aware of individuals who are marginalized and involve them
- keep confidential discussions private