TCN 5271 – Spring 2018
UBIQUITOUS & EMBEDDED SENSOR NETWORK CENTRIC TELECOMMUNICATIONS

Department of Electrical and Computer Engineering

FLORIDA INTERNATIONAL UNIVERSITY

SYLLABUS

Course Organization:

Instructor: Dr. Kemal Akkaya
Email: kakkaya@fiu.edu
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Office Hours: Friday: 10:30am-12pm

TA: Abdullah Aydeger
E-Mail: aayde001@fiu.edu
Office: EC 3135
Office Hours: By Appointment

Course Description:

This is a course designed as a graduate-level course, which covers the basics of Internet-of-Things (IoT) and Ubiquitous Computing. The course presents an insider's perspective on the existing paradigms in terms of communication of smart and embedded sensor devices and presents the underlying protocols that are used for their communication. Since the course is intended to serve students with a background in Electrical and Computer Engineering, some computer networking background is expected. Topics covered include sensing platforms, applications, wireless protocols for communication at various layers of TCP/IP stack, Arduino/Raspberry PI programming, and social aspects of IoT.

Course Web Site: The lectures, HWs, quiz and other announcements will be made available through Blackboard: http://online.fiu.edu. The lecture notes will be both in ppt and pdf format. They will be available before the class. It is your responsibility to check the announcements on the web site frequently to follow what is new about the course.

Textbook:

None.

Class lectures and papers will be used.

Grading:

Group project	28%
Midterm Exam	20%
Final Exam	25%
Quizzes	12%
Assignments	15%

Assignments:

- There will be 5 assignments as scheduled in the course calendar.
- The due dates will be one week ahead of the assignment date. Late assignments are not acceptable for points.
- Each assignment will be done individually.
- The assignments will be submitted through Assignment Dropbox.

Project/paper:

- There will be term project assigned at the beginning of the semester and due to the end of the semester.
- This project will be done in groups of 2-3 people.
- It can involve hardware/software implementation or paper writing (research).
- The project will be submitted through Assignment Dropbox.
- You can also propose your own project.
- Start thinking about your project groups now.

Quizzes:

- There will be a quiz each week regarding the topics covered in the previous classes.
- There will be 6 graded quizzes.
- The quizzes will be open books and notes.
- Each quiz will be 20 minutes.

Late Assignments/Project: All assignments and projects are due by the end of class on the date established by the Instructor. Your grade is based on timely work accomplished during the semester. Late assignments are not acceptable for points.

Laptop/Smart Device Policy: Students are expected to follow the lecture and thus not permitted to use their laptops/ipads/phones during the lectures.

Exam Policy: The exams will be closed-book and closed-notes. The final exam will be comprehensive. No makeup exams will be given.

Academic Integrity: By enrolling in this course, each student assumes the responsibilities of an active participant in FIU's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. If we catch anyone cheating, we will take the maximum action possible against them, including reporting the matter to the appropriate university authorities. Please cooperate by doing your own work and not seeking inappropriate help from your classmates. You may, of course, discuss HWs and assignments amongst yourselves, as long as that discussion does not lead to a exchange of solutions.

Course Schedule

Week	Tentative Topics	Assignment/Exam
1	**Introduction**: Definitions, Challenges, Applications	Project Assignment
1-4	**Review:** Networking Basics, Protocol Layering Summary of Physical Layer Concepts Summary of Link Layer Concepts Summary of Network Layer Concepts Summary of Radio Basics, Antennas	Assignment 1
5-6	**Platforms for Sensing, Tagging and Actuation** Wireless Sensors and Actuators Smart Cards & Devices Tags Operating Systems Applications	Assignment 2
7	**Arduino and Raspberry PI** Programming with IoT	Assignment 3
8-9-10	**MAC Protocols for Internet of Things** IEEE 802.11 IEEE 802.15.4 Bluetooth (Low Energy) LORA 5G	Assignment 4
11-12	**Network Protocols for Internet of Things** 6LowPAN RPL Zigbee	Midterm
13-14	**Application-level Protocols** COAP XMPP REST	Assignment 5
15	**Project Demos/Presentations**	