WAYNE STATE UNIVERSITY
COLLEGE OF ENGINEERING

Computer Science Department

CSC 7290 – Advanced Computer Networking

Section 001
Computer Science
M W 4:00 -- 5:15pm 0311 STAT
Winter 2017

Faculty contact information:
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Course Description:
This is an advanced networking class for graduate students with sufficient background in computer networks. The objective of the course is to make students familiar with the foundations of computer networking, network protocol design and performance evaluation/analysis, and recent advances in network architecture and technology. Each student will be required to complete a semester-long individual research project related to the theme of this course. Any topic in the computer networking field can be chosen upon approval from the instructor. This is not a group project. At the end of the semester, each student will present his/her work in class and turn in a full-length conference or journal- style paper describing the project.

Supplementary information for the course is available at http://blackboard.wayne.edu. Log on with your Access ID for lecture slides, announcements, course syllabus, and other information for the course. You will submit your assignments and project and check grades there too.

Credit Hours: 3

Prerequisite: CSC 6290

Required and optional textbook(s):
There is no required textbook as the course contents will be mostly from recent conference/journal papers and from a number of books. However, there are two recommended books as follows.

[1] Wireless Communications: Principles and Practice, by Ted S. Rappaport, Prentice Hall.
[2] Computer Networking - A Top-Down Approach, Kurose and Ross – 7th Edition.

Computer Programs:
Following are some helpful tools for implementing and evaluating (if needed) your project.

- NesC, C/C++, Java
- GNU Radio
- QualNet, TOSSIM

Course contents:

1. Foundations of computer networking, Wireless fundamentals, Introduction to signal processing, Fourier Transformation applications
2. Digital modulation techniques: ASK, FSF, PSK, QAM, QPSK
3. Frequency division multiplexing (FDM) and OFDM
4. Infrastructure and ad hoc networks
5. Wireless sensor networks
6. Real-time network design and protocol
7. Sensing and control over wireless
8. White Space and cognitive radio networking
9. Recent LPWAN (Low-Power Wide Area Network) technologies
10. Game theory and application in networks

Course Learning Objectives:
Upon successful completion of this class, the student will be able to:

- Be familiar with
  - Fundamentals of network design
  - Advanced network topics
  - State-of-the-art networking research.
- To start research in the area of networking.
- To read, write, and present work on networking.
- To write critique on a research paper.
- Work independently on a networking research project.
- Be familiar with one or more tools for implementing computer network projects.

Assessment:

Attendance and class discussion: 5%
Presentation: 30%
Homework: 30%
Research project: 35%

Grading Scale:
Score distribution (on a scale of 100) for letter grades is as follows.

A: 90-100	A-: 85-89
B+: 80-84	B: 75-79
B-: 70-74	C+: 65-69
C: 60-64	F: 0-59

Grading Policies:
Homework/tests cannot be submitted/taken late unless there is prior approval from the instructor, or there is formal evidence of medical/other emergencies. Grades will be uploaded in Blackboard within week of submission.

Religious Holidays:
Because of the extraordinary variety of religious affiliations of the University student body and staff, the Academic Calendar makes no provisions for religious holidays. However, it is University policy to respect the faith and religious obligations of the individual. Students with classes or examinations that conflict with their religious observances are expected to notify their instructors well in advance so that mutually agreeable alternatives may be worked out.

Student Disabilities Services:

- If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located in the Adamany Undergraduate Library. The SDS telephone number is 313-577-1851 or 313-202-4216 (Videophone use only). Once your accommodation is in place, someone can meet with you privately to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.
- Students who are registered with Student Disability Services and who are eligible for alternate testing accommodations such as extended test time and/or a distraction-reduced environment should present the required test permit to the professor at least one week in advance of the exam. Federal law requires that a student registered with SDS is entitled to the reasonable accommodations specified in the student's accommodation letter, which might include allowing the student to take the final exam on a day different than the rest of the class.

Academic Dishonesty - Plagiarism and Cheating:
Academic misbehavior means any activity that tends to compromise the academic integrity of the institution or subvert the education process. All forms of academic misbehavior are prohibited at Wayne State University, as outlined in the Student Code of Conduct (http://www.doso.wayne.edu/student-conduct-services.html). Students who commit or assist in committing dishonest acts are subject to downgrading (to a failing grade for the test, paper, or other course-related activity in question, or for the entire course) and/or additional sanctions as described in the Student Code of Conduct.

- **Cheating:** Intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information or assistance in any academic exercise. Examples include: (a) copying from another student's test paper; (b) allowing another student to copy from a test paper; (c) using unauthorized material such as a "cheat sheet" during an exam.
- **Fabrication:** Intentional and unauthorized falsification of any information or citation. Examples include: (a) citation of information not taken from the source indicated; (b) listing sources in a bibliography not used in a research paper.

- **Plagiarism:** To take and use another's words or ideas as one's own. Examples include: (a) failure to use appropriate referencing when using the words or ideas of other persons; (b) altering the language, paraphrasing, omitting, rearranging, or forming new combinations of words in an attempt to make the thoughts of another appear as your own.
- **Othe**r forms of academic misbehavior include, but are not limited to: (a) unauthorized use of resources, or any attempt to limit another student's access to educational resources, or any attempt to alter equipment so as to lead to an incorrect answer for subsequent users; (b) enlisting the assistance of a substitute in the taking of examinations; (c) violating course rules as defined in the course syllabus or other written information provided to the student; (d) selling, buying or stealing all or part of an un-administered test or answers to the test; (e) changing or altering a grade on a test or other academic grade records.

Course Drops and Withdrawals: In the first two weeks of the (full) term, students can drop this class and receive 100% tuition and course fee cancellation. After the end of the second week there is no tuition or fee cancellation. Students who wish to withdraw from the class can initiate a withdrawal request on Pipeline. You will receive a transcript notation of WP (passing), WF (failing), or WN (no graded work) at the time of withdrawal. No withdrawals can be initiated after the end of the tenth week. Students enrolled in the 10th week and beyond will receive a grade. Because withdrawing from courses may have negative academic and financial consequences, students considering course withdrawal should make sure they fully understand all the consequences before taking this step. More information on this can be found at:
http://reg.wayne.edu/pdf-policies/students.pdf

Student services:

- The Academic Success Center (1600 Undergraduate Library) assists students with content in select courses and in strengthening study skills. Visit www.success.wayne.edu for schedules and information on study skills workshops, tutoring and supplemental instruction (primarily in 1000 and 2000 level courses).
- The Writing Center is located on the 2nd floor of the Undergraduate Library and provides individual tutoring consultations free of charge. Visit http://clasweb.clas.wayne.edu/writing to obtain information on tutors, appointments, and the type of help they can provide.

Class recordings:
Students need prior written permission from the instructor before recording any portion of this class. If permission is granted, the audio and/or video recording is to be used only for the student's personal instructional use. Such recordings are not intended for a wider public audience, such as postings to the internet or sharing with others. Students registered with Student Disabilities Services (SDS) who wish to record class materials must present their specific accommodation to the instructor, who will subsequently comply with the request unless there is some specific reason why s/he cannot, such as discussion of confidential or protected information.