Syllabus
ECE 629: Wireless Networks

Course Number: ECE 629
Recommended Prerequisite: ECE 531 or ECE 542 or permission of instructor

Instructor: Bijan Jabbari, Professor **Email:** bjabbari@gmu.edu
Semester: Spring Semester

Course Description
The course covers foundation and design of wireless communication networks. It includes radio channel characterization, transmission techniques for mobile radio, state-of-the-art performance evaluation of channel, resource assignment and network infrastructure, and mobility, handoff, interference, and capacity modeling applicable to wireless cellular and local networks. Additional topics covered include system architecture, control traffic loading, resource optimization, multi-access protocols, admission policy and call control, as well as spectrum sharing technique and coexistence, and multilayer network configurations.

Note to those who are taking the course
This is a graduate-level (MS/PhD) course in wireless communications networks. This class will cover necessary theoretical foundation and state of the art performance evaluation methods for wireless networks. In a nutshell, this course will give you the basis for understanding the radio and infrastructure aspect of the wireless networks. There will be weekly homework assignments/projects (possibly requiring a model development on a computer), a mid-term and final exams. The acceptable paper topics and the associated timetable will be discussed in class. It would be preferable if your term paper included writing a software program to model a specific aspect of wireless networks

Course outline
- Lecture 1: Overview and review of background
- Lecture 2: Wireless Communications and Networking - system view
- Lecture 3: Radio Channel Characteristics
- Lecture 4: Transmission Techniques for Mobile Radio
- Lecture 5: Interference and Basic Concepts in Cellular Radio Systems
- Lecture 6: Wireless Multiple Access Techniques
- Lecture 7: Mobility and Traffic Analysis
- Midterm (in-class)
- Lecture 8: Handoff Techniques
- Lecture 9: Mobility Management in Wireless and Wireline Interworking
- Lecture 10: Resource Allocation

- Lecture 11: Ad-hoc Networks
- Lecture 12: Packet Radio and Next Generation Networks
- Lecture 13: Spectrum Sharing Technique and other Selected Topics
- Final Exam

Textbook and References

M. Schwartz, Mobile Wireless Communications, Cambridge University Press, latest edition (Required).

B. Jabbari, lecture notes (will be made available to students through web posting).

Grading:

Student performance will be evaluated by exams, homework and projects/term-paper on advanced topics. The grading policy is as follows:

Homework	5%
Projects/Term-Paper	20%
Mid-term Examination	35%
Final Examination	40%

Both Midterm Exam and Final Exam will be in-class and closed-book.