Course: ECE4390-A: Introduction to Radar and Electromagnetic Sensing

Instructor: Prof Morris Cohen

Term: Fall 2026

Description: Radar transmission, scattering, detection. Air traffic control, meteorological, others. Signal processing, doppler shifts, tracking, estimation, rain and clutter, atmospheric propagation, antennas. Remote sensing, LIDAR, SONAR.

Outcomes: Distinguish between different types of radars for different applications. Analyze the building blocks to modern radars, including antennas, transmission schemes, atmospheric and ionospheric propagation, signal detection, estimation, tracking, noise and clutter reduction. Identify the tradeoffs that underly radar design and implementation. Analyze an existing radar system, synthesize the information and explain to an audience. Describe several application areas of radars for remote sensing.

Required materials: No textbooks or materials are required.

Grading policy and weighting: 20% Homeworks, 30% Quizzes, 15% Preliminary project proposal, 15% Final project presentation , 20% Final Exam . >90% for an A, >80% for an B, >70% for an C, >60% for a D.

Attendance policy: Not required but for certain course activities may contribute in small portion to grading.

Additional criteria for successful completion of the course: None

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