**Stevens Institute of Technology**  
**Department of Electrical and Computer Engineering**  
**Course Outline**

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<th>Course Code</th>
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<tr>
<td>EE510WS</td>
<td>Introduction to Radar Systems</td>
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**Texts:**  

**References:**  

**Instructor:**  
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**Website:**  
Canvas

**Prerequisites:**  
Undergraduate-level understanding of probability, random variables, and DSP

**Contents:**  
Propagation of EM waves, range equations, and system structure. Signal models, radar cross section of targets and clutter, multipath, statistical models; Swerling models. Ambiguity function, radar waveforms including LFM and coded waveforms. Sampling in range, angle, Doppler, and space. Doppler processing, moving target indicator (MTI), and pulse Doppler processing. Spatial filtering, data-independent beamforming, and adaptive beamforming. Neyman-Pearson detection and likelihood ratio test, coherent and noncoherent integration, Albersheim’s equation. CFAR detection, cell averaging and extensions, order statistics CFAR, and adaptive CFAR.

**Grading:**  
Homework assignments: 60%; Matlab projects: 40%. No exams.

**Miscellaneous:**  
Homework will be assigned and collected on a regular basis; certain of these problems will be graded and/or discussed. **No late work will be accepted.**  
You are responsible for all assignments, changes of assignments, announcements of exam dates, and other course-related events announced online or by e-mail.