Instructor: Predrag Spasojevic, WINLAB 111. Office Hours: MTh 11:30-12:30
Contact: spasojev@winlab.rutgers.edu

Course web page: http://www.winlab.rutgers.edu/~spasojev/courses/421

http://www.wiley.com/college/haykin

Suggested Readings:
Digital Communications, Bernard Sklar, Prentice Hall
Communications System Design Using DSP Algorithm, Steven Tretter, Plenum Press

Course Topical
- Random process characterization, stationarity, and power spectral density
- Baseband pulse and passband digital transmission
- Coherent and non-coherent modulation, PSK, FSK, D-PSK, M-ary PAM
- Matched filter, maximum-likelihood, linear, and correlation receivers.
- Inter-symbol interference, Nyquist criterion, equalization, and eye pattern
- Error-rate performance analysis
- Geometric signal representation and vector channels
- Synchronization, carrier and symbol timing recovery
- Fading channels and characterization
- Spread-spectrum modulation, direct sequence and frequency hopping
- Adaptive antenna arrays
- Discrete memoryless channel, mutual information, and capacity.

Grading and Percentage Breakdown:

<table>
<thead>
<tr>
<th></th>
<th>Percentage of Grade</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>35%</td>
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<tr>
<td>Random Quizzes</td>
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<tr>
<td>Homework</td>
<td>5%</td>
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<tr>
<td>Project</td>
<td>20%</td>
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</tbody>
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*NOTE: One randomly selected homework will be graded.*