Lecture 04: Exam 1 Review

CS 356R

Intro to Wireless Networks

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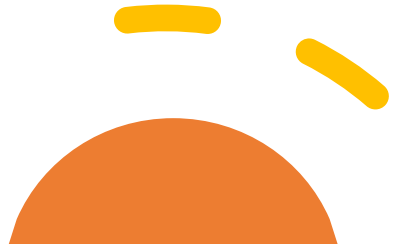

Exam format

It will be a mixture of

- True/false
- Multiple choice
- Matching
- Fill in the blanks
- Discussion: need to explain why and what
- Matlab programming: pseudo-code is ok. Add lots of comments!
- 1 double sized (letter size) cheat sheet allowed

Topics covered

- **Protocols and layers**
- **RF intro**
  - amplitude, frequency, phase of a signal
  - Basic integration
- **Fourier series primer**
  - Euler number and $e^{i\theta}$ and $e^{-i\theta}$
  - Trigonometric identity
  - Inner product and orthogonality (for vector and signal)
  - Normalizing vector/signal
  - Delta (impulse) function and integration
  - Fundamental frequency
  - Shannon Nyquist sampling theorem

Topics covered

- **Fourier series**
  - In terms of e^{ikt}
  - In terms of cos and sin
- **Fourier transform and inverse Fourier transform**
  - Basic calculation given definition
- **DFT and IDFT**
  - Given time-domain samples f what is fhat?
  - Meaning of fhat
  - Abs of fhat, PSD
  - Given fhat how to construct original signal?
  - fft and ifft matlab example/Lab/denoise/distort

Topics covered

- Modulation/Demodulation
  - ASK, PSK, QPSK
  - QAM
  - I/Q modulation
- OFDM
- Channel basics
  - Nyquist bandwidth
  - Shannon theorem
  - SNR
  - Multipath
  - Fading
- Anything from lecture notes/slides, Panopto videos, matlab code, in-class exercises and EXs, and Lab