

Indian Institute of Technology Bombay
Dept of Electrical Engineering

Handout 1
General Course Information

EE 327 Signal Processing
July 22, 2015

EE 210 SIGNALS AND SYSTEMS

Time and location: Wed/Fridays, 9:30–10:55 am, EEG-001

Web page: <http://www.ee.iitb.ac.in/~bsraj/courses/ee210/>

Instructor: Prof. Sibi Raj B Pillai
Office: Third Floor, EE Main Building
Phone: 7419
E-mail: bsraj att ee

Prerequisites:

Logical reasoning skills and appreciation for abstract concepts.

Course mechanics:

Assignments(6-8) 20%, Midterm Exam 30%, Final Exam 40%,
Programming Experiments-GNURADIO 10%.

Approximate Outline:

Signals, Systems, Motivation, Linear Systems, Examples
Signal Representation, Transforms
System Representation and Properties
Sampling and Reconstruction, DTFT, DFT and FFT
Basics of Filtering, analog and digital filter design
Applications: Error Correction/Compressed Sensing.
Noise, Estimation and Detection (*Time Permitting*)

Textbook: Feel free to choose one among the many good books listed below. Lecture notes for most parts will be provided.

Reference Material:

1. S. Haykin and B. Van Veen, *Signals and Systems*, Wiley, 2003.
2. A. Oppenheim, A. Willsky and S. Nawab, *Signals and Systems* Prentice Hall 1996.
3. J. Proakis and D. Manolakis, *DSP: Principles, Algorithms and Applications* Prentice Hall 1997.
4. P. Bremaud, *Mathematical Principles of Signal Processing*, Springer 2002.
5. E. Stein and R. Shakarchi, *Fourier Analysis*, Princeton Lectures in Analysis 2003.

A short paragraph from “Terence Tao, Analysis-I” is copied here with minor modifications. It is on how mathematical logic, which he describes in an appendix, should be learnt. This applies to our course too.

Logic is an innate skill that needs to be learnt like any other, but this skill is also innate to all of you. Indeed, you probably use the laws of logic unconsciously in your every day speech, and in your own internal (non-mathematical) reasoning. However, it does take a bit of training and practice to recognize this innate skill and apply it to abstract situations such as those encountered in mathematical proofs. Because logic is innate, the laws of logic that you learn should make sense. If you find yourself having to memorize one of the principles or laws of logic here, without feeling a mental click or comprehending why that law should work, then you will not be able to use that law of logic correctly and effectively in practice. So please don't study this *section* the way you might cram before a final, that is going to be useless. Instead, put away your high-lighter pen, and read and understand this *section* than merely studying it.

The

word in italics is actually ‘appendix’, but I changed it to ‘section’