Signals & Systems Course Overview

Reference books:

1) A. V. Oppenheim, A. S. Willsky, and S. H. Nawab, —Signals and Systems,‖ 2nd Edition, Prentice Hall, 2003.
2) B.P. Lathi, —Principles of Linear Systems and Signals,‖ Oxford University Press, 2nd Edition, 2009.
3) Hsu H.P. - Schuam's outline of Signals and systems - McGraw Hill (2011).

Additional Resources:

- TA Question Bank Topic Wise - Problems Set by Shivani Dhok and Varad Pimpalkhute

Software:

1) MATLAB 2017b
2) GNU Octave (Can also try Octave online)

Lab Practicals:

1) Record your voice and perform operations on it.
    a) Amplifying
    b) Changing freq, etc.
2) Basic operations on an input signal.
    a) Flipping
    b) Scaling
    c) Shifting, etc.
3) Verification of unique digital frequency range of discrete-time sinusoidal.
    a) The discrete frequency has a range of [-0.5,0.5]. After this, the waveform starts to repeat.
4) Lab 4
    a) Convolution of a general input signal and impulse response.
    b) Studying different types of impulse responses and plotting the convolution of the respective input.
5) Euler's Equation
    a) Representation of complex numbers as complex exponential and plotting it.
6) Fourier Series Coefficients for continuous-time signals.
    a) Compute and plot coefficients
7) Fourier Series Coefficients for discrete-time signals.
    a) Compute and plot coefficients
8) Study of Gibb's Phenomenon for continuous-time signals.
9) Analyze Fourier Transform
10) Generating high pass and loss pass filters, and accordingly building image filters.
11) Moire Pattern (Aliasing).
12) Visualization of Laplace Plane.
13) Calculating Laplace and Inverse Laplace functions using inbuilt function.

Project:

Submit a project that makes use of the techniques or advanced versions of the techniques studied in the course.