Quiz 1 - 10
Quiz 2 - 10
Assn - 20   } Theory = 100
Mid - 25
Final - 35

Submission - 15
Mid Exam - 10   } Lab = 40
Project/End Exam - 15

Textbooks:
Signals & Systems by Oppenheim
DSP, JG Prowakis

Addn: Principles of SP, BP Lathi
DSP: Sanjit K Mitra

Signal Processing

Prof. Santosh Nannuru

$A > 130$
$F < 60$

Labs:
MATLAB Based
Github Submission

Tutorial: 10:30 - 11:30 Saturday

Signal Processing

→ **Overview of NeSS:-**

- Time variant — function of time

- Signals can be a function of any variable, need not be time always.

- Multi-Dimensional signals — images and videos.

- Anything that carries information is a signal.

- The course focuses more on discrete time signals, since most digital devices work in a discrete manner.

- System process signals, $x(t) \longrightarrow System (H) \longrightarrow y(t)$.

- LTI system — Linear and Time-Invariant Systems.

- Any circuit with only R, L, C will always form an LTI system, since R, L, C are all linear components.

  Diodes and Transistors form non-linear systems.

o In any LTI system, the output $y(t)$ of a signal $x(t)$ is,

$$y(t) = \int_{-\infty}^{\infty} x(\tau)\, h(t-\tau)\, d\tau \longrightarrow \text{Convolution}$$

$h(t)$ = impulse response of the system.

o **Laplace Transform :-**

   Representation of the signal in the s / complex frequency domain.

• Poles of the system function determine the behaviour / properties of the system.

• RoC - Region in the complex s - plane where the Laplace transform converges. Is always a vertical strip, defined by the location of poles.

o **Fourier Series :-**

• Any periodic signal can be represented as a sum of sines and cosines.