Learning Outcomes

- 1. Describe a periodic signal in time domain by defining its properties such as the fundamental period and fundamental frequency
- 2. Define a periodic signal as a sum of sinusoids or complex exponentials, i.e. create Fourier series representation of a periodic signal through both Fourier synthesis and analysis equations
- 3. Construct the spectrum representation of a periodic signal
- 4. Construct forward and inverse Fourier Transform of both periodic and non-periodic continuous-time signals
- 5. Identify Finite Impulse Response systems, Linear Time Invariant Systems, and their properties
- 6. Define the impulse response of an LTI system both in continuous time and discrete-time, and system properties such as stability and causality
- 7. Define the frequency response of an LTI system and its properties
- 8. Describe ideal frequency selective filters (low-pass, high-pass, band-pass) in frequency domain
- 9. Perform frequency filtering over the spectrum of a signal
- 10. Describe Sampling Theorem and conversion between continuous time and discrete-time domains
- 11. Describe principles of an Amplitude Modulation and Demodulation System.
- 12. Apply Fourier transform tools to various data processing problems.
- 13. Implement the above concepts in a programming environment (PYTHON)