ECE/EEE F311 Communication Systems (First Semester 2023-2024)
Lab-2 (Saturday) (29-08-2023)

Objectives

In this task, the objective is to process the signal over a system and see the effect of system on the signal.

Task 1

use .* for muliplication

(a) $m(t) = \sin(4\pi t) + \frac{1}{3}\sin(12\pi t) + \frac{1}{5}\sin(20\pi t) + \frac{1}{7}\sin(28\pi t)$. Plot $m(t)$ and $|M(f)|$.

(b) If $x(t) = m(t)\cos 50\pi t$, where $m(t)$ is from 1(a). Plot $x(t)$ and $|X(f)|$.

Task 2

(a) Plot the time domain and frequency domain of the signal $m(t) = m_1(t)m_2(t)m_3(t)$, where $m_1(t) = 200sinc(200\pi t)$, $m_2(t) = 400sinc(400\pi t)$, and $m_3(t) = 800sinc(800\pi t)$

(b) Pass the signal $m(t)$ over a transmitter block such that the output bandwidth is limited to 200 Hz. Use function "conv".

```
g_t = 400 * sinc(400 * t);   % so that its limited to 200 Hz

% Convolve the modulated signal with the Gaussian pulse
x_t = conv(m_t, g_t, 'same') * ts; % Convolution and scaling
```