19L-1316 lab report 9:

Introduction:

The Fourier series represents periodic, continuous-time signals as a weighted sum of continuoustime sinusoids. It is widely used to analyze and synthesize periodic signals. ... The general form expresses the signal as a weighted sum of harmonically related complex sinusoids

Objective:

Decomposition of a periodic signal into its Exponential Fourier series coefficients

Plotting of magnitude and phase spectra using exponential coefficients

Applications:

The Fourier series has many such applications in electrical engineering, vibration analysis, acoustics, optics, signal processing, image processing, quantum mechanics, econometrics, shell theory, etc.

Issues:

I face no issue regarding this lab.

Conclusion:

In this lab how learn about the decomposition of a periodic signal into its Exponential Fourier series coefficients and to learn about the plotting of magnitude and phase spectra using exponential coefficients

Post lab:

function ak =EFS(x,T,n,t) temp1=(x.\*exp(-i.\*n.\*(2.\*pi/T).\*t)); temp=int(temp1,[-10 10]); ak=((1/T)\*(temp)); dn\_magnitude=abs(ak); dn\_angle=angle(ak); dn\_angle=rad2deg(dn\_angle); subplot(221); stem(n,dn\_magnitude); ylabel('y-axis'); title('DN Magnitude'); subplot(222); stem(n,dn\_angle); ylabel('y-axis'); title('DN Angle'); end

commond window:

n=-10:1:10;

T=2;

syms t;

x=cos(t).\*(n>0 & n<6);

EFS(x,T,n,t);

