**Homework #1**

**Problem 1**

**Script**

clear all

close all

clc

format compact

MyFile = 'data.txt';

Fid = fopen (MyFile,'rt');

A = fscanf(Fid,'%f %f',[2,inf]);

B=A';

x=B(:,1);

y=B(:,2);

fclose(Fid);

plot(x,y,'o','MarkerSize',6,'MarkerEdgeColor','k','MarkerFaceColor','g')

init\_value = 0.03;

tau = 85;

theta = 75;

gain =-0.0015;

fprintf('Time Constant %g s\n',tau);

fprintf('Delay %g s\n',theta);

fprintf('Process Gain %g \n',gain);

s = tf('s');

hold on

G\_foptd = exp(-theta\*s)\*gain/(tau\*s + 1);

t = 0:5:500;

[z t] = step(G\_foptd,t);

z = z + init\_value;

plot (t,z,'Linewidth',2)

grid on

title ('Consistency Loop FC-104', 'Fontsize',15,'FontWeight','bold')

xlabel ('Time, s','Fontsize',13,'FontWeight','bold')

ylabel ('C(t)','Fontsize',13,'FontWeight','bold')

legend ({'Experiment','Fitting'},'Fontsize',12,'FontWeight','bold')

hold off

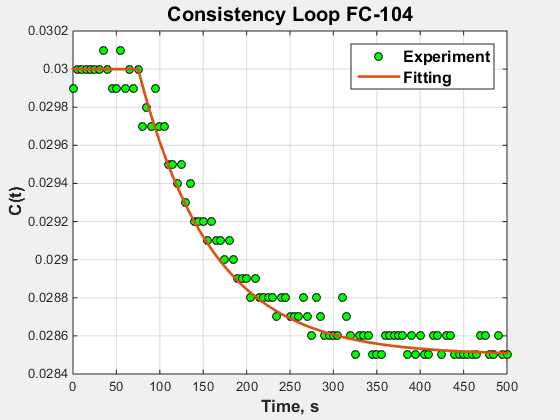
**Result**

Time Constant 85 s

Delay 75 s

Process Gain -0.0015

**Graph**

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