Tutorial 4

ECE 804- *State Space Models*

1. Consider the linear system described by the state equations:

$$\dot{x}_1 = x_2$$
$$\dot{x}_2 = -2x_1 - 3x_2 + u$$
$$y = x_1$$

a. Write the state equations in matrix form $\dot{\mathbf{x}} = A\mathbf{x} + Bu; y = C\mathbf{x} + Du$.

b. Analyze the stability properties of the system.

c. Determine x(t) and y(t) when u(t) is the step function and x(0)=$[1\ 0]^T$.

d. Repeat c with u(t)=sin2t.