Combining Full-State Feedback with an Observer

- Consider

$$\dot{x} = Ax + Bu$$
$$y = Cx$$

where (A, B) is controllable and (A, C) is observable.

- We know how to find K, such that $A - BK$ has desired eigenvalues (controller poles).

- Since we do not have access to x, we must design an observer. But this time, we need a slight modification because of the Bu term.