AER372: Control Systems

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Contents

1   System Models

Terminology:

- **System:** A collection of components of interest, demarcated by a boundary, interacting through certain physical principles (device / process / plant)

- **System Parameters (C)**: Properties that define the components of the system

- **State Variables (X)**: A minimal set of variables that completely identify the state of the system at each moment.

- **Static System:** The output vector $Y(t)$ depends only on the input vector $U(t)$ at time t. For any given input, state variables do not change, i.e.

$$Y(t) = H(U(t), C) \tag{1.1}$$

- **Dynamic System:** The current value of the output depends on the past history as well as the present values of the input. For any given input, state variables change in time.