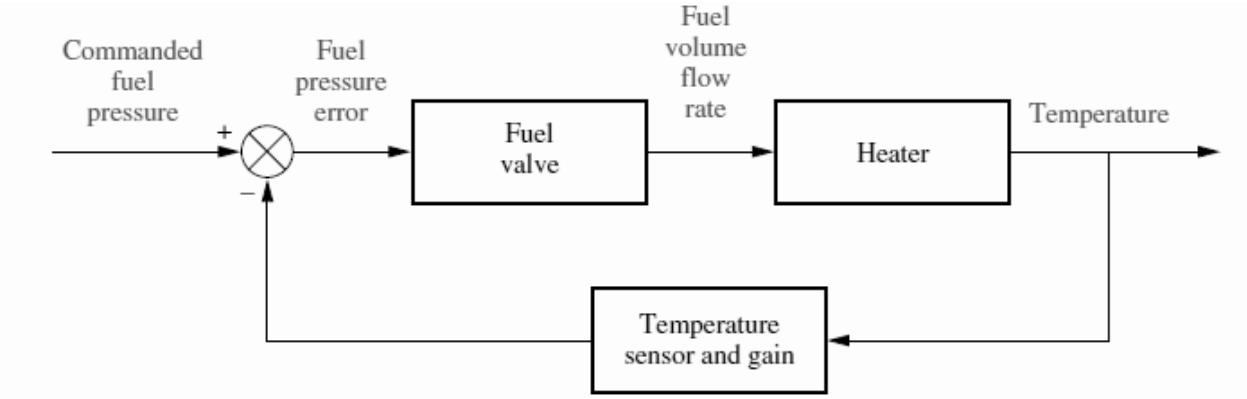
# Linear Control Systems Final Project

Jan- 2022

The commanded fuel pressure is proportional to the desired temperature. The difference between the commanded fuel pressure and a measured pressure related to the output temperature is used to actuate a valve and release fuel to the heater. The rate of fuel flow determines the temperature. When the output temperature equals the equivalent commanded temperature as determined by the commanded fuel pressure, the fuel flow is stopped and the heater shuts off (Tyner, 1968).




Block diagram of a gas-fired heater

$$G_H(s) = \frac{1}{(s+0.4)(s+0.8)} \frac{\text{degrees F}}{\text{ft}^3/\text{min}}$$

$$G_v(s) = \frac{5}{s+5} \frac{\text{ft}^3/\text{min}}{\text{psi}}$$

**Control specifications:**

- a 5% overshoot
- a settling time of 10 minutes
- minimum steady state error