# EE6302 Control System Design

*Unit 2: Dynamic Model and the Transfer Function of a System*

**2.1 Dynamic Modeling**

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The overall goal of a feedback system is to force output variables of a process to follow a desired reference value accurately. This goal is made as a result of number of steps. The first step is to develop a mathematical description (mathematical model) of a process to be controlled. The term dynamic mode means a set of differential equations that describe the dynamic behavior of the system. The dynamic model can be obtained by using principles of underline physics of the system.

**Transfer Function**

Transfer Function is defined as the ratio of the Laplace transpose of the system response to the Laplace transpose of excitation (input to the system) assuming the entire initial conditions to be zero.

If $G(s)$ be the transfer function of the system, we can write mathematically,