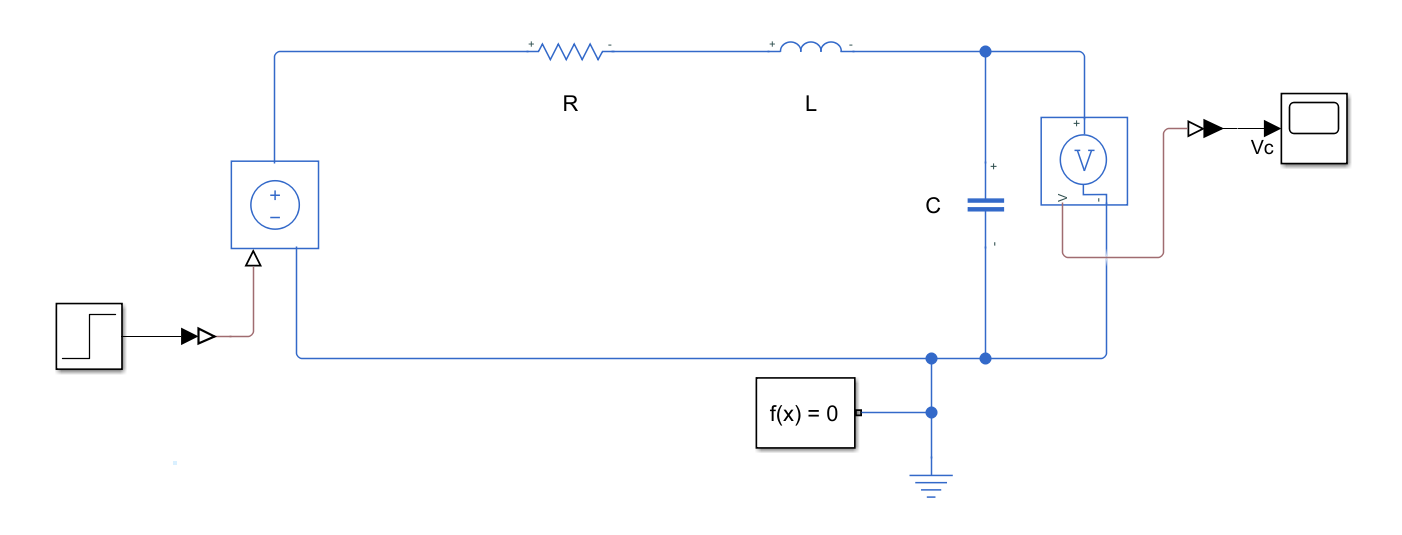
**EE49001: Control and Electronic System Design**

Assignment-7: Transfer Function Estimation

Submitted By:

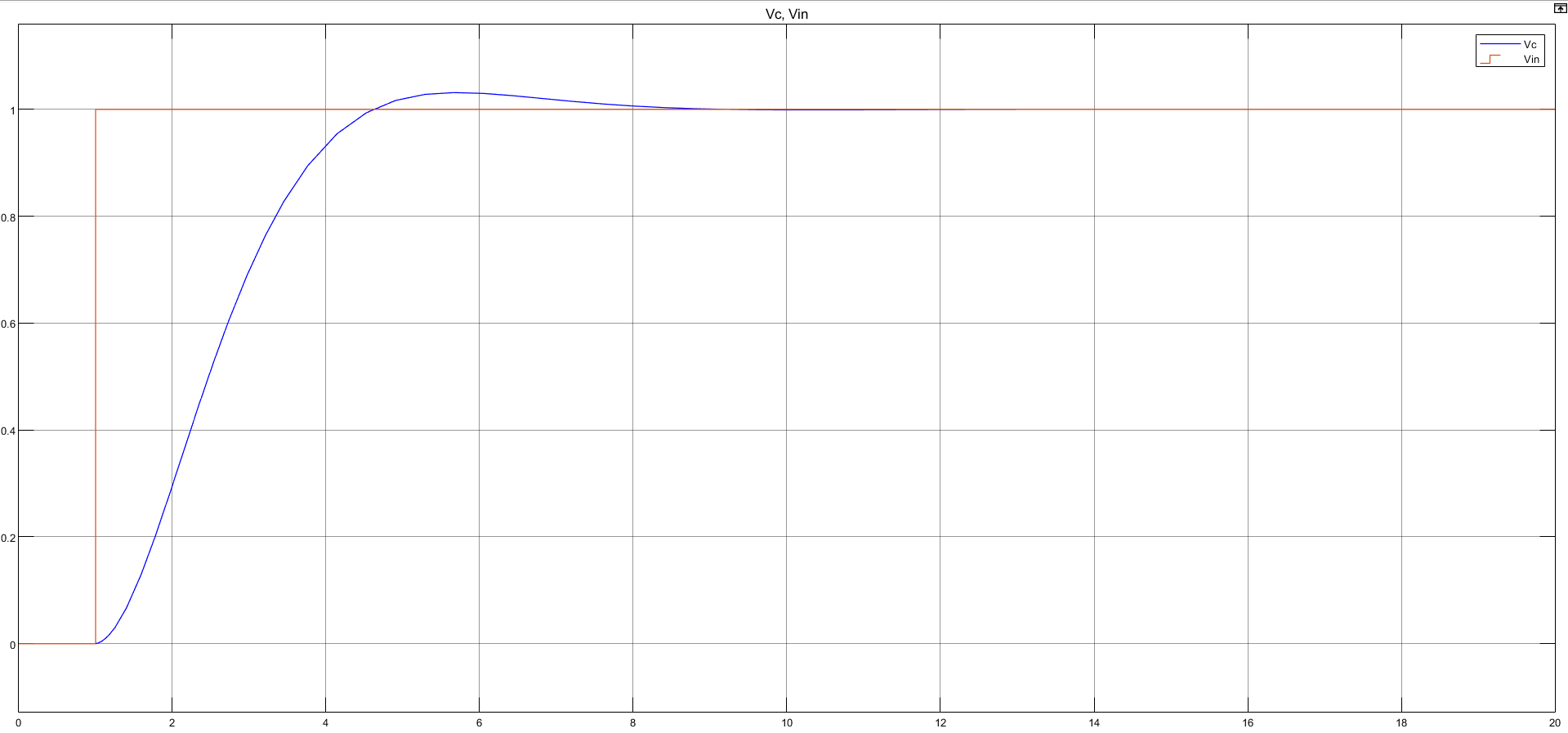
21EE30004: Anirvan Krishna | 21EE30001: Aditya Kumar

# Simulink Model of RLC Series Circuit and Step Response



**Fig.** RLC Series Circuit Simulink Model

Here, we have:

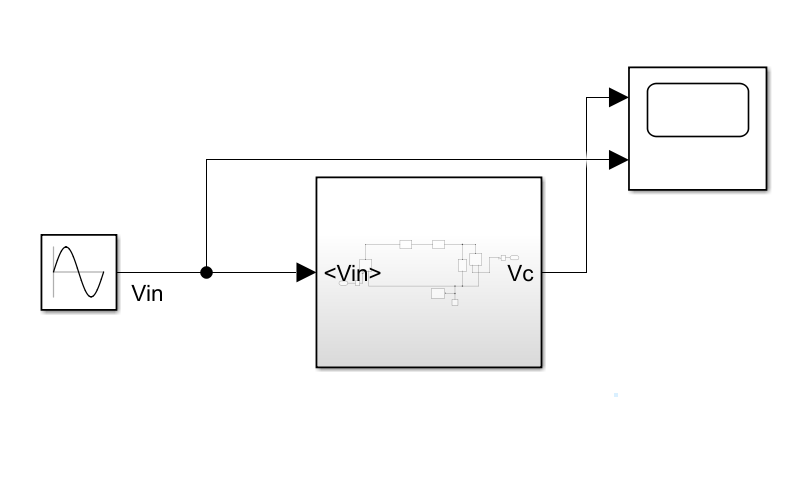


**Fig.** Input and Output vs. Time

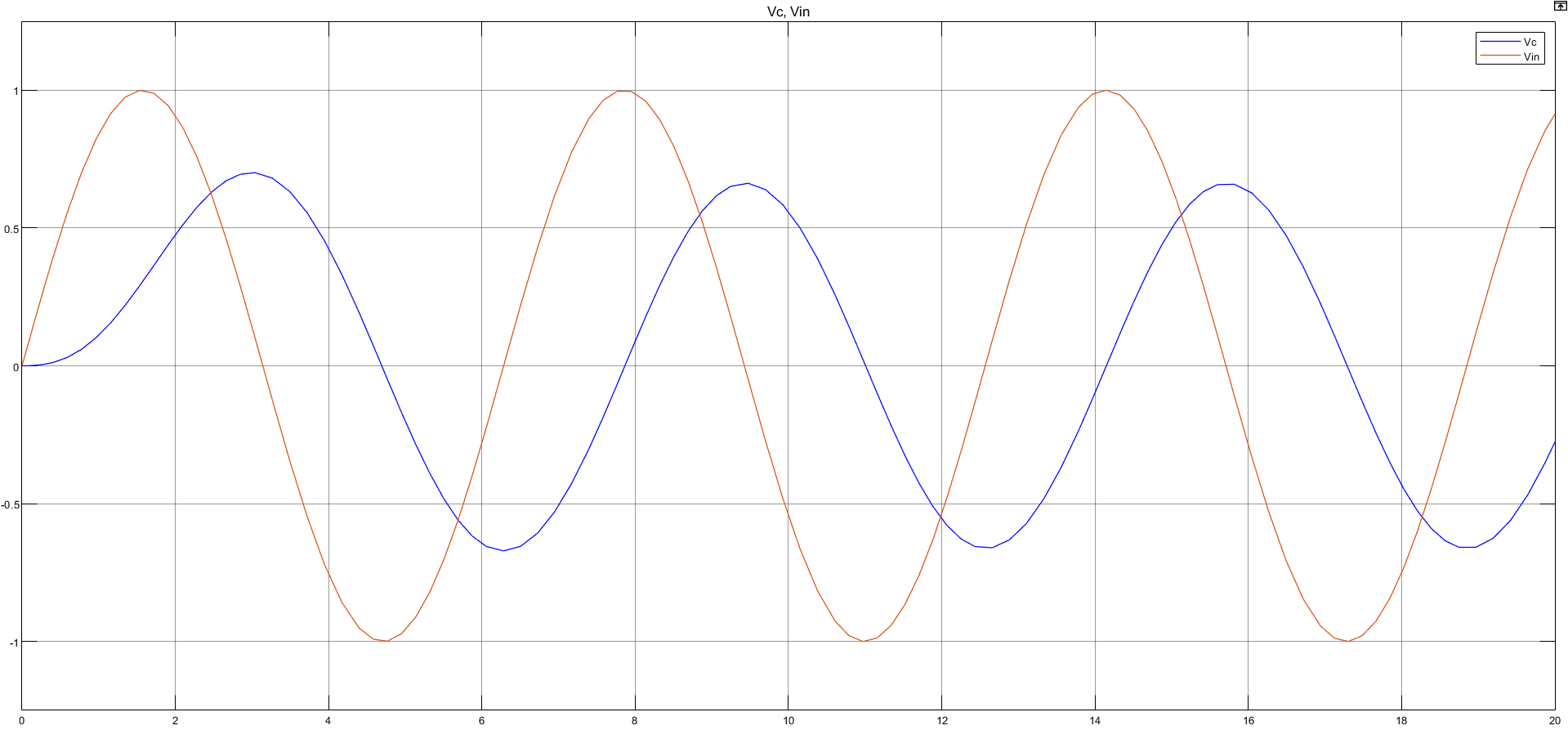
From the system response, we can observe that the system is underdamped.

# Transfer Function computation from step response

# Response to Sinusoidal Input



**Fig.** Application of Sinusoidal Input to the system



**Fig.** System response corresponding to sinusoidal input

# Analytical Derivation of the Transfer Function

For an RLC Series circuit, total impedance, in Laplace domain can be written as:

Therefore, the transfer function is given as: