

Homework #4 (Temperature Controller)

Due Wed, 9/26/07

You're given the same oven from the previous homework. The heater is controlled by a solid state relay (SSR). The relay is designed to turn on with 5V and draw about 10mA. You are given a **5V power supply** that can provide up to 100mA. A **LM35 temperature sensor** is mounted in the oven and when powered provides a **10mV/C output** (i.e. the output is 100mV@10C, 200mV@20C, etc).

Complete the design to keep the oven at 50C. Since this is above room temperature you want to turn on the heater when the oven is below 50C.

Hint: Remember that **the LM311 has an open collector output**. Look at the example in the datasheet of the LM311 connected to a relay. Once you have the circuit figured out on scratch paper print this page and complete the circuit. **List all resistor values** (and don't forget the power supply decoupling caps). **Show all power and ground connections**. Lastly add a sentence or two explaining how the circuit works.

