Mini-Project Requirements
## Due by: Friday, 28 October 2016 - 5:00pm

The required mini-project is to design and document a variable speed fan controller using a thermistor, an instrumentation amplifier and a microcontroller. The speed of the fan should gradually increase as the temperature measured by your thermistor increases. A single 5V supply will be used to power your mini-project and the fan. To ensure that the fan spins up at power on, you should provide a burst period where you run the fan at full speed for a second or two. When the temperature reaches between 80°-90°F the fan should start to increase in speed and must reach full speed between 120-130°F (PWM = 100% duty cycle). The actual RPM of the fan can be monitored through the open-collector "TACH" port on the test fixture where the speed is represented a 2 ticks per rotation.

Specific Requirements:

1) Demonstration of a variable speed fan controller meeting the following specs:
   a. At power up the controller will burst the fan then hold at an idle speed.
   b. The fan will transition to first speed above idle between 80°- 90°F.
   c. The fan will spin at full speed between 120°-130° and above.
   d. There must be at least 12 different fan speeds between 80° and 130°F.
   e. The amplifier, microcontroller and fan run from the same 5V supply.

2) Submission of a detailed schematic of your actual circuit. The schematic can be created in a CAD package like Mentor Graphics Design Capture or may be neatly hand drawn.

3) Submission of cleanly formatted source code of your actual design.

4) Submission of a one page, typed, single spaced report describing the functionality of the hardware and software of your variable speed fan controller design.

5) Be able to describe the circuit design and software operation of your system.

Mini-Project Test Fixture:
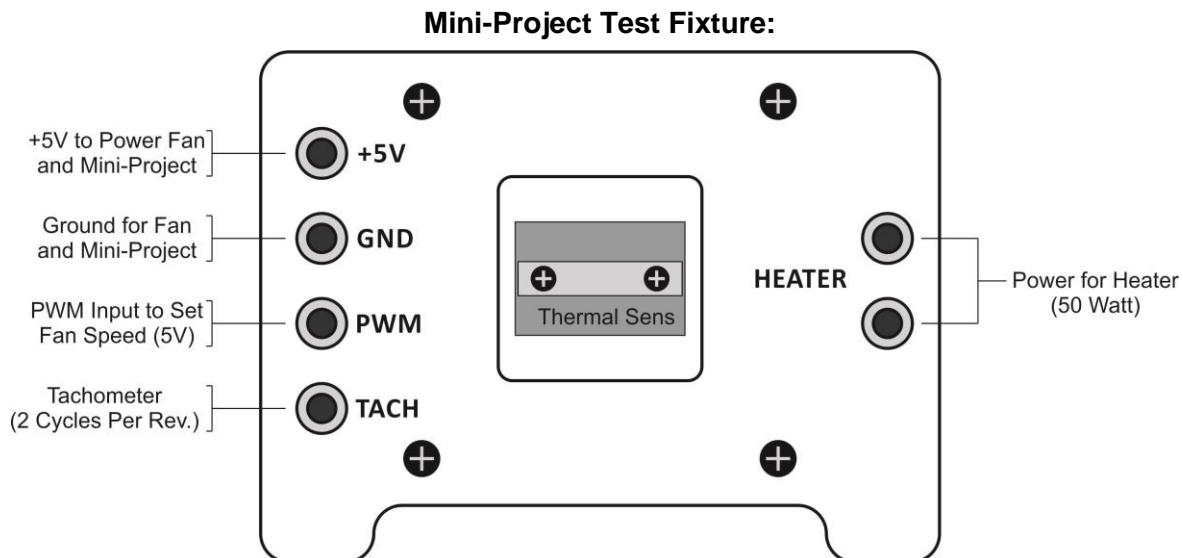
* The Grade for Mini-Projects submitted after 28 October will be reduced by 10% per class day.

** Failure to complete the Mini-Project will result in a grade of "Incomplete" for the class.