Hello, this a video for Engineering Measurement & System Monitoring unit, learning outcome one where we have to measure mechanical quantities.

We are going to do a temperature measurement using a K type thermocouple, there are a few more meters we to read compared with the other experiments. The circuit is set up, without the heater element plugged in, as when it is plugged in there is no control of the experiment. When the element is heated up there is no way of cooling it down so it must be left for a long time before the experiment can be repeated. When the experiment starts a stopwatch is started when the heater element is plugged in and readings taken at one minute intervals for a period of ten minutes. Recording our results involves taking three readings – hot junction, cold junction and the output of the thermocouple. So the hot junction comes out at the “INT” and the other lead goes down to zero volts, the multimeter is set to volts with a dash for DC. Then the second meter for cold junction goes into “REF” and the other lead goes down to zero volts. If you ever see a negative reading on the meters just swap the leads to change the polarity and make it positive but it will have the same magnitude. We can see from the diagram the output of the thermocouple goes into the amplifier and then the meter connected, also to zero volts.

To start the experiment turn the board on at the wall and the back switch. Take the three readings cold, hot and thermocouple output before starting the heater. Then take a lead from twelve volts to the heater element, remember only one connection is needed. The output voltage will now appear to rise. Start the stopwatch and take readings every minute. From the results a graph can be drawn. The best fir line will highlight the presents of errors. With the stopwatch and the time needed to take the reading this could be a source of error. Also, resolution and accuracy of the instruments are a problem.

Thank you for listening.