# ME 322 – Thermodynamics

# Unit Conversion Activity

**Background:**
Keeping track of and working with units is an important component of engineering problem solving. In this activity you will perform a few unit conversions – some in SI units, and some in English units.

**Objectives:**

1. Use units as a quick way to check answers.
2. Keep track of and cancel units (and conversions) in all hand calculations on assignments.

**Problems:**

1. The net thermal efficiency (ηo) can be defined by the equation:

$$η\_{o}=\frac{1}{-∆H\*sfc}$$

Where –ΔH is the heating value of the fuel, and sfc is the specific fuel consumption.

For a particular engine using gasoline fuel (–ΔH = 42 MJ/kg) the specific fuel consumption is measured to be 248 g/kW\*hr. Calculate the net thermal efficiency for this engine.

1. For the same engine, as measured in English units, the values were: –ΔH =1.81 \*104 Btu/lbm, and sfc=0.408 lbm/hp\*hr. Calculate the net thermal efficiency for this engine.

**Some useful unit conversions:**

1 Btu = 778.169 ft\*lbf

1 hp = 550 ft\*lbf/s