

EXERCISE10

- Copy the directory “Exercise11” from
/export/home/thf272/ME5013/Fall2014/Exercise11 into your
home directory: \$HOME/ME5013/Fall2014/Exercises/InClass.
- Edit the python code in order to calculate average toughness from the
stress-strain data (provided the .dat files). In this case use **Trapezoidal
Rule** for integration. **Make sure** you convert engineering stress and
strain into true stress and strain before calculating the toughness.
- Once you are done with this, do the assignment 11 given on the website.

$$Toughness = \frac{Energy}{Volume} = \int_0^{\epsilon_{Fracture}} \sigma d\epsilon \quad (1)$$

Here, $\epsilon_{Fracture}$ is the strain at failure, σ is stress and $d\epsilon \approx \Delta\epsilon := \|\epsilon_{i+1} - \epsilon_i\|$.
In **Trapezoidal Rule** rule if the parallel sides are a and b , distance between
them is h , the $Area = \frac{(a+b)}{2} \times h$