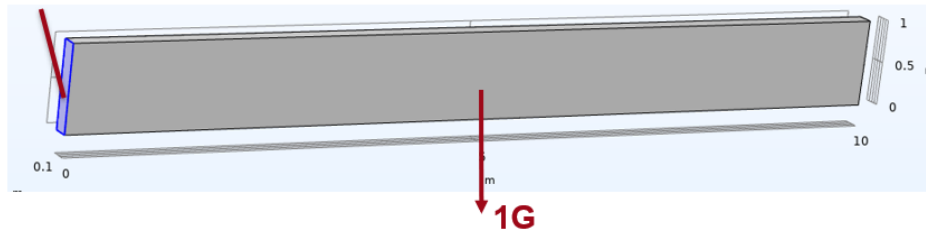


ENR145 Assignment #7: happy COMSOL folks!

Due: 3/11/26 12:00 pm

Show me that you do can a solid-heat coupling model of a wax beam. Work out the beam of slide #9 and #10.

Constrained here on this face



For heat transfer, you need to increase the k and C_p value so the heat gradient established in 1 min.

A screenshot of the COMSOL software interface. On the left is a tree view showing the model structure: Heat Transfer in Solids (ht) containing Solid 1, Initial Values 1, Thermal Insulation 1, Heat Flux 1, and Heat Flux 2; and Solid Mechanics (solid) containing Linear Elastic Material 1, Free 1, Initial Values 1, Fixed Constraint 1, and Body Load 1. A red arrow points from the "Solid 1" entry in the tree to the "Settings" window for "Solid 1". The "Settings" window shows the "Heat Conduction, Solid" section with the following properties:

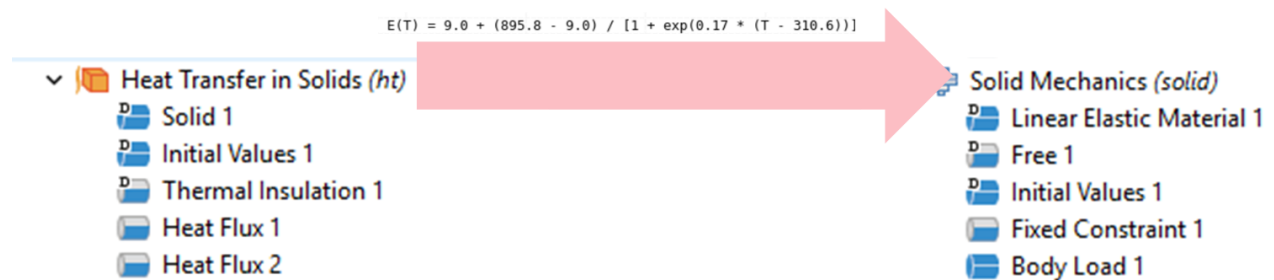
- Thermal conductivity: k User defined, 0.2 W/(m-K)
- Density: ρ User defined
- Heat capacity: C_p User defined, 2.5 J/(kg-K)

The values for k and C_p are highlighted with red boxes. A red text box with a black border is overlaid on the screenshot, containing the text "Change them so heat transferred faster!".

Now couple this T dependent E into the solid mechanics

$$E = 9.0 + (895.8-9)/(1+\exp(0.17*(T-310.6)))$$

You have to play with the range to speed up the simulation.



To prove your effects, submit a slide with screenshot of crucial steps, and the result of stress and strain surface and slice view. Show me the stress & strain of different time point.