

## Home Exercise 5

A steel string of length  $L=1\text{m}$  with a cross section area of  $A=2\text{mm}^2$  is pre-tensioned by a force  $H=500\text{N}$ . Use CALFEM and set up a FE-model of the string by using 30 linear elements and corresponding consistent mass. Use the model to:

- Determine the three lowest vibration frequencies of the string and the corresponding three lowest modes of vibration.
- Determine the free vibration response using Calvem and `step2` (undamped system). The string is released from rest in the shape shown below at  $t = 0$ . Record  $u(L/2, t)$  if the string is displaced  $u_{mid} = 0.01\text{m}$ . Compute for  $t < 2\text{s}$ .
- Use the FFT-routine in the Measurements Lecture to analyse the frequency content in the displacement history using the mid displacement from b)

