Last Updated: October 10, 2019 at 1:47pm

Name:

Final Project

Due 12 Dec 2019

Choose a real life object which undergoes crack extension (can be anything, including work you find in the literature). Use the methods developed in this course to model crack extension (should use cohesive zone or XFEM), justify your choice and any assumptions you make in your model.

- estimate the stress intensity factor and strain energy release rate, compare with the closest possible analytic solution
- justify a choice of crack propagation model and explain its advantages
- model the crack propagation
- interpret the results of your model and explain their significance

You will likely need to make simplifying assumptions and material substitutions at many, if not all, stages of this project. Demonstrate your engineering and damage tolerance knowledge by justifying these assumptions and/or substitutions as concretely as possible. (For example, if you make the assumption that your part is in plane stress, show how accurate this.)

Remember that this project is in place of a final exam. As such, you should demonstrate an understanding of what we have learned in this course in your project. Good scientific plots and figures are generally helpful in understanding and explaining the overall results. Reports should be no longer than 20 pages.

Projects will be graded on the following rubric

- Project abstract - 5% (due 24 Oct 2019)
- Stress intensity and strain energy release rate analysis - 20%
- Crack propagation justification - 20%
- Crack propagation model - 25%
- Conclusions - 15%
- General presentation, organization, and grammar - 15%