ME345 Modeling and Simulation
Professor Frank Fisher
Department of Mechanical Engineering, Stevens Inst. of Technology

Suggestions for Preparing Technical (Case Study) Reports

Presentation of Results

- **Use an outline** to organize your report. Sections should flow naturally - your paper must be organized in such a way that it is easy for the reader to follow.
- **Do not assume** that the reader knows exactly what you are doing. Your report should lead the reader through your work, your analysis, and your results.
- All papers should be **proof-read** for clarity and to eliminate typographical errors.
- You must **correctly reference material** that you have taken from another source. This includes text, figures, and tables. One cannot text from a paper/website without properly acknowledging the source.
- Be sure to **justify the plots** that you show in the body of your report. Do you really need to show stress and strain plots of the same analysis? (If the answer is 'yes', then this should be discussed in the text; if the answer is 'no', then do not include in the body of the report.)
- **Include captions for ALL figures and tables, and each figure/table MUST be referenced in the text.** If the figure/table is important enough to include in your paper, then there must be some discussion in the text that refers specifically to the figure/table. Explain why the plots are important – interpret them for the reader
- **Include your figures INLINE in the text,** below where it is first referenced in the text. (Can alter within reason for spacing, i.e. so that you don't have a blank half page with the figure at the top of the next page.) Do not include all figures at the end of the report.
- **Be sure that your plots are legible** for the reader (particularly if taking screen shots of results). If the reader cannot read the legend of values of the axis values in your figure, the figure will be meaningless.
- **Assume that your reports will be printed in Black & White.** Color plots should have some means to be identified if printed in B&W. (i.e. use different line types, use arrows to identify different curves, etc)
- **When presenting data in a Table**, be sure the reader can understand what you are trying to convey through the table. For large data sets a plot may be much more useful. It would be uncommon (although not impossible) to have a scenario where the same data would be presented in both a table and a plot.
- Use **appropriate significant figures and engineering notation** when presenting your results. Results like 123754982 Pa are asking for trouble. What is more important is if the number is 12.3 or 123 MPa.
- **Formatting counts.** Poorly formatted papers are difficult/painful to read. If you are not careful in formatting your paper, why would the reader assume that you are careful in your technical work?
- **Use an Appendix appropriately.** An appendix should be used to put additional 'auxiliary or complimentary' information that is not necessary in the flow of the report. Some hints when

preparing an appendix: 1) Assume that the reader will not read the appendix. 2) Can the reader read an Appendix without reading the rest of the report and have an understanding of what is being presented? (i.e. You should include some brief description in the appendix; it should not just be a locations where spare graphs and data are dumped).

- **Be sure to write in a manner appropriate for a technical report**, using appropriate wording/jargon/tone. Unfortunately technical results are 'cool' or 'wicked awesome'. Avoid hyperbole in your writeups.
- **Do NOT count the number of pages in your report.** Reports can be BOTH too short as well as too long. Be concise and direct with your writing so that the reader can follow your logic. Your report should not be a mystery with a surprise at the end!

Analysis of Results

- **Be careful to use the correct units** in your model (i.e. radians vs. degrees, rad/s vs. Hz, etc).
- **Be careful that you are correctly interpreting the results** of the software analysis. (For example, some software packages use a 'magnification factor' when displaying deformation - the actual deformation may be orders of magnitude smaller)
- **Use common sense & engineering judgment** when analyzing results (necessary but not sufficient condition). **"Back of the Envelope" calculations** can also be useful here. But don't just do the analysis and circle your answer – discuss what it means in terms of the problem you are modeling.
- **Be quantitative** in the discussion of your results! When you say the results are 'close'… how close is close? When you say that your model and analytical solution 'agree'… how close are they. Is it sensible that they are that close? (Sometimes they could be close due to error)
- **Be careful in attributing errors** to things like 'mesh size' or 'round-off error'. This may be possible, but if so you should be able to justify why you reached this conclusion.
- **Justify your conclusions** drawn from the analysis. If the results are sensible, clearly explain to the reader why they make sense.