CE 315 term project specifications

The term project involves doing additional reading and programming to solve a problem of your choice using computational methods. Your results should be written in engineering lab report format. You will also give a very short in-class presentation of your topic and main findings.

1   Project topic proposal

You can choose any computational problem that you find of interest, preferably one from engineering. Prepare a 2-3 page proposal that concisely states the project title, the problem you want to work on, why it's important or significant (give 2-4 references and briefly explain what each one tells you), and which mathematical models, numerical methods, and programming-language functions or capabilities you expect to use. The grade you get for the proposal will count for 2% of the project grade. You may be asked to revise or change the topic if it isn't suitable or if someone else is already doing it. If you don't hear back within one week of the proposal due date, you can consider it approved and proceed with the first draft.

2   Project format

See also the project grading rubric on the class website. If you have any questions about the expectations, please ask as soon as possible.

Oral presentation (20% of project grade)

Your presentation should be no more than 5 minutes long (typically 4-6 slides). It should be structured as follows:

a) Introduction: State the topic and why it's important. (1-2 min)

b) Results: Show 2-3 key figures and explain what they mean in a way that's understandable to the average CE315 student. (2-3 min)

c) Conclusions: What you achieved, what you learned. (1 min)

Written report (70% of project grade)

Your written report should be around 10-15 pages (single spaced) and contain the following sections:

a) Abstract – Summarize your problem, methods, key results, and conclusions in one paragraph. (½ page)

b) Introduction – Concisely describe your problem and how it relates to material we discussed in class. Also include 1-2 applications of your problem to engineering (with at least 3 references to textbooks, technical manuals, or journal articles); if you can't find engineering applications, then provide applications to science or math areas. (1-3 pages)

c) Methods – Describe the algorithms you used to solve the problem (and why you chose them). Include (and justify) any simplifying approximations or assumptions you made in solving the problem. With these approximations, how accurate is the answer to the original problem expected to be? Describe any special difficulties that came up when programming the solution and how you overcame them. (2-3 pages)

d) Results – Include graphics that clearly show your main findings. Provide an estimate of the error in your results (and explain how you estimated the error). Show that your method works with some generality, by showing results for different numerical values or versions of the problem. (2-4 pages)

e) Conclusions – Summarize how your work solves the problem given and how it might be useful in applications. Comment on possible extensions and improvements. (1 page)

f) Bibliography – List alphabetically all references cited, using ASCE's format. References should be to technical literature, not to popular media or anonymous websites (such as Wikipedia).

g) Appendices, including your computer code.

Grammar and spelling matter. Have friends proofread your drafts, and get help at the Writing Center.

> *Report first draft (8% of project grade)*

Good writing generally requires several rounds of revisiting and editing the ideas that you first put down. To help you with this, a first draft of the written report must be submitted. It should be close to complete, containing all the required sections. I will review your draft and return it with comments so that you can correct any problems.

> *Academic integrity*

All material taken from other sources needs to be properly cited in your report. The in-text citations should include author, year, and page number. Put quotation marks around all verbatim quotes. If you find yourself quoting or paraphrasing whole sentences, you need to study the topic so that you can explain it in your own words instead.

If you use any program that you didn't write yourself, don't copy it in your report; instead, cite it, and explain in the Methods section what it does, how it works, and how you used it.

Including anyone else's material in your project without following the above guidelines will likely result in not getting any credit for the project, and possibly other sanctions as per the policies of CUNY and the CE department.

3   Project submission

Due dates for the project components are in the syllabus. Details on how to submit them will be given on Blackboard or by e-mail. The proposal will be due around 1/3 of the way through the class, the first draft will be due at around the 2/3 point, and the final report and presentation will be due near

the end of the semester. Grades will be reduced by 10% for missing any of the due dates, with no credit for submitting more than 1 day late.