Lab Report Format

All labs performed in CE 573 / 773, except the final lab project, require an individually prepared lab report. The goal of the report is to summarize and interpret your results, comparing them with other published results, and to answer specific questions related to the particular lab. The lab reports should be neatly presented (typed, 12-pt font), be written with correct spelling and grammar, be concise, and include the following:

1. A brief **Introduction** or **Background** section summarizing the purpose of the lab and the experimental approach taken. This should not be copied or paraphrased from the lab handout, but it should be placed into your own words. It is appropriate to site other literature in the introduction or background section of a lab. Also, the introduction should foreshadow any points you make in your discussion section.

2. A **Methods** section noting procedures utilized. This section should simply describe the experimental procedure and any methods that were used. Sometimes, an illustration of the experimental matrix is helpful, if it clarifies the experimental procedure to the reader. This should be written in paragraph form, as you would see in a published paper! It is not appropriate to reproduce the lab handout. A general rule of thumb for a methods section is that a reader that is knowledgable with labwork should be able to perform your experiment. If published methods are used, such as *Standard Methods*, you should simply site that reference and state that you followed it.

3. A **Results** section that summarizes the data that was produced. This section should also be written in paragraph form. Also, graphs and/or tables of results should be placed in this section, and some statistical analysis of error should generally be noted, if possible. Like the methods section, this section should be written in a matter of fact, scientific way, simply describing to the reader what data was produced. Generally, raw data should never be included in a scientific report. You should analyze the data and summarize it to the reader, in such a way that can be referenced in the discussion section to support your findings. If a table or graph is included in this section, you should always describe the findings to a reader in paragraph form. Never take for granted that a reader will be able to read a table or graph!

4. A **Discussion** section follows the results section and should include a scientific interpretation of the results of your experiment and their meaning in a larger context. At a minimum, you should discuss how the results inform the experimental purpose (i.e., was the goal of the experiment accomplished?). It is appropriate in this section to compare your results with other published papers, or to use published papers to aid in the interpretation of data.

5. A brief **Conclusion** that summarizes key practical observations and conclusions from the lab. This section should be very concise. On occasion, it is appropriate to use bullets, instead of paragraphs, to emphasize points. If bullets are used, writing should still be grammatically correct.

6. A **Reference** section should include any references that were cited in the paper. **A minimum of five primary scientific citations are required for each lab report. Textbooks are not included in this count.** Students should not site any websites or wikipedia as informational sources in their reports.

   For the purposes of citing work, formatting according to the journal *Water Research* should be used.

7. A section that directly answers the **Questions** asked in the handout. This should be placed at the end of the lab report, such as an Appendix would be.

The lab reports will be graded with the attached rubric in mind.

CE 573 / 773 – LAB GRADING RUBRIC - SPRING 2008

Organization, Grammar and Spelling	10 pts	7 - 9 pts	4 - 6 pts	0 - 3 pts
	Paragraphs are well-structured, and thoughts flow logically from one section to the next. The grammar and spelling are near- perfect. Lab is neat and tidy.	There is a clear organization, although some statements or thoughts seem to "hang" from the rest of the text. There are some noticeable grammatical errors.	The organization and grammar distract the reader at times from the scientific points. Author sometimes switches between present and past tense.	The report is poorly structured. There are numerous grammatical and spelling mistakes.
Introduction / Background	10 pts	7 - 9 pts	4 - 6 pts	0 - 3 pts
	The introduction states the experimental purpose and significance. It provides a brief overview of the experiment. It foreshadows the discussion section sites appropriate literature.	The introduction lacks some focus but mentions an experimental purpose and significance.	The introduction is largely modeled on the lab handout but shows some originality.	The introduction is largely modeled on the lab handout.
Methods	10 pts	7 - 9 pts	4 - 6 pts	0 - 3 pts
	Section is concisely written and well-organized. Methods are referenced whenever possible, and any figures or tables illustrate the experimental design.	Section is written in paragraph form, but it sometimes reads as a to-do list. Figures and/or tables are not well incorporated into the text.	Section is largely modeled on the lab handout but is written in paragraph form.	Section is largely modeled on lab handout.
Results	17 - 20 pts	11 - 16 pts	6 - 10 pts	0 - 5 pts
	The author has analyzed the data in a way that summarizes the results with a measure of error. The text and paragraphs clearly describe the most significant data results. Tables and figures provide a visual and meaningful representation.	The author has performed some data analysis and presents figures or tables with an indication of error. Although these are present, they and/or the descriptive text may not summarize the most significant results.	There is a little data analysis, but it does not seem very rigorous. The text does not summarize the major points to the reader.	Data analysis is seriously needed. The text is not descriptive of the results.
Discussion	17 - 20 pts	11 - 16 pts	6 - 10 pts	0 - 5 pts
	The discussion thoroughly and logically interprets the data and places it in a larger context. Referenced literature supports the data interpretation.	The discussion provides some interpretation of the data, and sites some primary scientific literature.	The discussion basically summarizes the results again. There may be some references, but they are disjointed from the results and do not seem to reinforce the discussion.	There is very little attempt to interpret the results or include a larger context for the experiment.
Conclusion	5 pts	3 - 4 pts	1 - 2 pts	0 pts
	The conclusions are concise and illustrate the major findings of the experiment.	The author may list all the experimental findings, not narrowing down the most significant. The writing is concise.	The conclusions are not focused on the scientific findings but rather on the learning objectives.	Proper effort not shown.
References Sited	5 pts	3 - 4 pts	1 - 2 pts	0 pts
	References are from scientific, peer-reviewed sources and are relevant to the experimental purpose, design, and/or interpretation of the data.	References are from scientific, peer-reviewed sources. They are only somewhat relevant to the experimental purpose, design, and/or interpretations.	The minimum references are sited, but they are not from peer-reviewed sources. They are not incorporated into the report in a meaningful way.	Minimum requirements not met.
Questions	20 pts (each question graded individually)			