

ENV 6438: Physical & Chemical Processes for Drinking Water Treatment
Department of Civil & Environmental Engineering
University of South Florida

Cunningham

Spring 2020

Semester Project

Project overview

1. Introduction

This document provides an overview of the requirements for the project that students in the Drinking Water Treatment class will complete this semester. As the semester progresses, additional guidance, materials, and documents will be provided. All documents for the project will be posted on Canvas. The project will count for 25% of each student's semester grade. That 25% will be further sub-divided into some different assignments, as described below.

2. Objectives of the Assignment

The purposes of this assignment are:

- to encourage you to learn more about processes of drinking water treatment;
- to give you practice researching a subject independently (outside the classroom);
- to give you an opportunity to practice working in a team setting;
- to give you experience making decisions and/or recommendations based on a body of evidence and opinions;
- to give you practice with effective written and oral communication; and
- to make you better informed with regard to an important scientific or engineering issue related to your own interests.

3. Description of the Assignment

This semester, you will prepare a written report and an oral presentation in which you *answer a question* of your own choosing. The question you choose to answer should:

- be related to the general class subject of drinking water treatment;
- interest you and motivate you to learn more; and
- be something you can answer this semester based on reading relevant books, articles, and relevant materials; but
- not have an obvious answer that could be provided without independent research; and
- *not* have a clear “right” or “wrong” answer, but rather leave room for your own interpretation or conclusion based on the available information and evidence.

For instance, I think any of the following questions would be appropriate:

- Should the US EPA promulgate a Maximum Contaminant Level for perchlorate, and if so, at what concentration should be the MCL be set?

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- Do pharmaceutical compounds in drinking water represent a significant threat to public health in the U.S.? Why or why not?
- Which chemical that is not currently regulated by the EPA under the Safe Drinking Water Act should be at the top of the Contaminant Candidate List, and why?
- What bacterial species is the best indicator of fecal contamination of drinking water, and why?
- Which chemical disinfectant (or combination of disinfectants) is the best choice for treatment of surface water, and why?

These are just a few examples. You should decide on a question that interests you personally.

For whichever question you decide to answer, you must form your own opinion or point of view, and then you must argue persuasively for your point of view, employing supporting evidence and a sound line of reasoning. Your paper will be evaluated primarily on the quality of your thinking and on its technical soundness, not on mechanics like grammar or punctuation (though that will count some too).

Hints: Answer the question that you asked. Make sure that you have a clear and coherent point of view, that your point of view addresses the question that you asked, and that I can easily discern your point of view. Make sure that you support your point of view with evidence and sound reasoning. Document your assertions with appropriate references.

4. Group Work

Students may work in groups or teams. The overall enrollment in the class may affect the allowable group sizes. Ideally there would be about 4–6 groups in the class. Group sizes should not exceed four students in any group. If enrollment is low, the maximum group size might be set at three students.

All members of the group will receive the same grade on most stages of the assignment (except for the peer review, which will be conducted individually). Therefore, it is in your individual interest to be sure that your group members are contributing to the effort. It is especially in your interests to make sure that nobody in your group conducts plagiarism, which would result in a ***failing semester grade (FF)*** for the entire group.

At the end of the semester, students will be given the opportunity to evaluate their group members' contributions. Group members who did not perform their fair share of the work will be penalized appropriately, and group members who did more than their fair share will be rewarded.

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5. Deliverables, Schedule, and Grading

The project will be completed in seven stages. As the semester progresses, additional details will be provided for each stage. Due dates and grade weighting for the seven stages are given in the table below.

Table 1: Project stages, due dates, and grade weight

Stage	Description / Assignment	Due Date	Grade Weight
1	Choose group members and question	Wed., Jan. 29	5.0 %
2	Annotated reference list	Wed., Feb. 19	7.5 %
3	Outline of paper	Mon., March 23	7.5 %
4	Rough draft of paper	Mon., Apr. 6	7.5 %
5	Peer review of somebody else's paper	Mon., Apr. 20	7.5 %
6	In-class oral presentation	Mon., Apr. 27 or Wed., Apr. 29	15.0 %
7	Final written report	Wed., May 6	50.0 %

6. Report Format

Rough drafts and final papers should be prepared in a standard word-processing software program (e.g., Microsoft Word) and printed on a high-quality printer. Single-sided or double-sided printing is acceptable. Students should use 1-inch margins and a standard font such as 12-point Times New Roman. Papers should be double-spaced.

For the purposes of formatting citations, tables and table headers, figures and figure captions, reference lists, and section headers, students should mimic the style of one of the following four journals: *Environmental Engineering Science*, *Environmental Science & Technology*, *Journal of the American Water Works Association*, or *Water Research*. Those are prominent peer-reviewed scientific journals that publish papers related to the supply and treatment of drinking water.

The first page of your paper should be a cover page that mimics the title section and the author list of the journal you selected. The second page should contain the abstract (and, if applicable, key words), again in the style of your selected journal. Main text should begin on page 3. Pages should be numbered, starting with the title page as page 1.

Tables and figures either can be embedded in the text of the paper, or can be provided separately at the end of the paper.

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7. Plagiarism

If I discover that your final report contains plagiarism, *all group members will receive a **failing grade for the semester***. It is in your individual interest to make sure that your group members do not engage in plagiarism. If you have questions about what constitutes plagiarism, ask.

In particular, note that proper citation must be given for any tables or figures that are copied or derived from another source.

At the instructor's discretion, students may be asked to submit an electronic copy of their paper through SafeAssign or a similar program that is designed to detect plagiarism.

It is the responsibility of each and every student to ensure that he/she understands what constitutes plagiarism. One really good hint for avoiding plagiarism is: **NEVER copy and paste text when you are writing a paper.**

8. Pedagogical Benefit

Different researchers in the field of education have developed models to describe how people think and learn. One of the most famous of these models is known as "Bloom's taxonomy", which was developed and presented in the middle of the 20th century. Bloom's taxonomy posited that there are six levels of cognitive thinking, and that these advance from lowest to highest in the following order: knowledge, comprehension, application, analysis, synthesis, and evaluation.

In this assignment, I am attempting to require you to engage in all levels of Bloom's taxonomy, even the highest levels. To complete this assignment well, you must gather information, store it, and understand it (knowledge and comprehension). You must make sense of all that you read and fit the pieces into a coherent framework with appropriate connections between the pieces, and you must be able to identify patterns and make generalizations (analysis). You must compile the gathered information in a way that enables you to answer a question to which you previously did not know the answer (application and synthesis). Finally, you must make judgements and you must present and defend your opinions (evaluation).

It is not reasonable for me to expect you to become a true expert on any given topic in a single semester. You might have trouble understanding some papers, you might make some errors in your analysis or your judgement, or you might make flawed recommendations. That is to be expected. However, that does not mean that it is unreasonable or inappropriate for me to ask you to attempt these tasks. To the contrary, it means that an assignment of this nature is likely to be a very valuable learning experience precisely *because* it requires you to perform all levels of thinking. Only by practicing these cognitive skills are you likely to ever improve (and, eventually, master) them!