

ENV 4417: Water Quality & Treatment
Department of Civil & Environmental Engineering
University of South Florida

Cunningham

Fall 2015

Semester Project

Project overview

1. Introduction

This document provides an overview of the requirements for the project that students in the Water Quality & 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.

During the semester, you will be given additional guidance and instructions. This document is intended to provide an overview only.

2. Objectives of the Assignment

The purposes of this assignment are:

- to provide you with an opportunity to learn more about processes of drinking water treatment and/or wastewater 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 help you understand how treatment processes in Environmental Engineering are linked to the quality of source water and/or final product water; and
- to give you practice with effective written and oral communication.

3. General Description of the Assignment

This semester, you will prepare a written report and an oral presentation in which you analyze one of the water or wastewater treatment plants in the Tampa Bay area. Key elements of your analysis will include:

- a consideration of the source water quality and/or the requirements for the final water quality produced by the plant;
- a description of the overall treatment train employed by the treatment plant;
- a description of any "unique" or special processes employed by the plant;
- a description of what specific conditions or requirements have led the plant to employ a specific process or set of processes; and
- an analysis of how the treatment train employed enables the plant to meet its treatment objectives.

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4. Some Possible Treatment Plants

The Tampa Bay area has many different interesting treatment plants for both water treatment and wastewater treatment. For drinking water, some plants of which I am aware that might be interesting are:

- City of Tampa, David Tippin drinking water facility
- City of Temple Terrace, groundwater softening
- Tampa Bay Water, Surface Water Treatment Plant
- Tampa Bay Water, seawater desalination plant
- City of Tarpon Springs, new reverse-osmosis facility for drinking water
- Pinellas County, S.K. Keller drinking water plant (uses air stripping...I don't know why)
- City of Dunedin, membrane softening

On the wastewater side of things, I am not as well informed. However, a few that I know about are:

- City of Tampa, Howard F Curren Advanced Wastewater Treatment Plant
- Pinellas County, South Cross Bayou Water Reclamation Facility
- City of Clearwater, some very interesting tertiary treatment being installed for water re-injection into the aquifer
- Hillsborough County, any of seven wastewater treatment plants, some of which use ultraviolet light for disinfection

Both of these are just partial lists that I could come up with off the top of my head. Feel free to explore and choose another facility if you wish.

5. Group Work

Students will probably be asked to work in groups. 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 zero grade 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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6. Deliverables, Schedule, and Grading

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

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

Description / Assignment	Due Date	Grade Weight
Form groups	Thurs., Aug. 27	4 %
Select treatment plant	Thurs., Sept. 3	4 %
Set date for class field trip	Thurs., Sept. 10	4 %
Initial site visit / gather information	Tues., Sept. 22	4 %
Outline of paper	Thurs., Oct. 1	10 %
Rough draft of paper	Thurs., Oct. 22	4 %
Peer review of other group's paper	Thurs., Nov. 12	10 %
In-class oral presentation	Dec. 1 and Dec. 3	10 %
Final written report	Tues., Dec. 8	40 %
Attend two field trips	by end of semester	10 %
Lab report (optional)		extra credit

7. 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 five journals: *Environmental Engineering Science*, *Environmental Science & Technology*, *Journal of the American Water Works Association*, *Water Research*, or *Water Environment Research*. Those are prominent peer-reviewed scientific journals that publish papers related to water and wastewater treatment.

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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.

8. Plagiarism

If I discover that your final report contains plagiarism, *all group members will receive zero credit* for the assignment. That is likely to have a significant negative impact on your semester grade. 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.

9. 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. 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 learn and fit the pieces into a coherent framework with appropriate connections between the pieces (synthesis), particularly with regard to understanding how the treatment processes achieve a desired objective (analysis). You must understand how individual operations in a treatment train work together to achieve a final goal (synthesis). If possible, you can offer your opinion on whether the treatment train employed by the utility is the best way to meet the utility's objectives, or if process changes might be warranted (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 of what you learn, or 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

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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!