2009 Winter Semester
ENGG*4260: WATER AND WASTEWATER TREATMENT DESIGN

Instructor:  Dr. Hongde Zhou   Room 1341, ext. 56990, hzhou@uoguelph.ca
Office hour:  Friday 11:00AM to noon or via e-mail

GTA:  Chris Potvin:  Room 321, ext, 52132, cspotvin@uoguelph.ca
Office hour:   Wednesday noon to 1:00PM

Meeting Times:  Room:  MCLN 107
Tuesday and Thursday  11:30AM to 12:50PM

Labs:  Section 101:  Monday 08:30AM to 10:20AM,  THRN 1103
Section 102:  Friday 12:30AM to 02:20PM,  THRN 1103

Prerequisites:  ENGG *3100, ENGG *3590
Note:  If you do not meet this requirement, see me immediately.

COURSE OBJECTIVES
The purpose of this course is to introduce students the current practices for the planning, design and operation of commonly used water and wastewater treatment facilities. Emphasis will be placed on integrating individual unit operations and processes to achieve the multiple treatment objectives while satisfying the given constraints. On successful completion of this course, you will be able to:

1) properly identify the critical issues and challenges in planning, design and operation of modern water and wastewater treatment facilities to meet not only current but also anticipated regulatory requirements,

2) develop reasonable working knowledge and hands-on experiences that can be used to devise and design the efficient and cost-effective treatment systems, and

3) gain the independent learning skills and enhance your ability to work effectively in teams through PBL format.

COURSE DESCRIPTION
The course mainly consists of four representative design projects in the field of water and wastewater treatment. They are:

1) Conventional coagulation/sedimentation/filtration for drinking water treatment

2) Chemical oxidation and disinfection

3) Biological processes for municipal wastewater treatment

4) Sludge processing and disposal

To complement these projects, the institutional, technological and environmental considerations governing water supply and wastewater discharge and the common approaches to estimate water use and wastewater generation will be reviewed. The applicability and limitations of these treatment technologies to resolve the current and emerging challenges such as the removal of harmful disinfection by-products, resistant microbial contaminants, biological nutrients, toxic synthetic organic compounds and water reuse will be highlighted.
COURSE FORMAT: PROBLEM BASED LEARNING (PBL)

The course will be mainly offered in PBL format. Thus, it is essential that you are ACTIVELY engaged in the meetings and TEACH each other. The PBL is only effective through frequent interactions with your peers. Through these interactions you will strengthen your own understanding through the frequent feedback from your peers and through the explanations to your peers. Note that we will help your meetings, we will help your teaching, we will answer questions - we will NOT run your meetings, we will NOT make your decisions.

Maximum group size is four students. Some groups of three may be permitted depending on the final numbers in the class. You may choose the group members but the members of your group for the first two projects should be completely different from those for the last two projects.

COURSE EVALUATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Project Reports (4)</td>
<td>40%</td>
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<tr>
<td>Quizzes/Assignments</td>
<td>20%</td>
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<tr>
<td>Final Exam (2:30 - 4:30pm, April 11)</td>
<td>40%</td>
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Design Reports. Each project report must meet the requirements and formats specified in the course handout in order to achieve the perceived course objectives. The report should be technically sound, CLEARLY readable, and concise. Don’t use your spare time to create a huge report!

Quizzes/Final Exam. All the quizzes and final exam will be open-book. You are allowed to bring the textbook, the course notes and non-communicating calculator but not the submitted project reports and assignments.

Other Policies. You must achieve a passing grade on the project section to pass the course. If you fail to do so, your final grade will be equal to that failing percentage.

If you miss a report or quizzes/assignments and have an acceptable, properly written excuse, the weight of the missed component will be added to the weight of the final exam.

Late submission of the project reports will be devalued by 50% per every day.

You may appeal any mark within one week after it has been posted on the course website with the written reasons for remarking.

Please also note that university policy specified in University Calendar will be followed strictly.

REQUIRED TEXTBOOK


Notes and selected publications on pertinent topics will be posted on the course website throughout the semester.
REFERENCE BOOKS


REFEREED JOURNALS

1. Water Research

2. Water Environment Research

3. American Water Works Association Journal

4. Journal of Environmental Engineering, ASCE

5. Environmental Science & Technology