

University of Guelph
School of Engineering
ENGG*4260: Water and Wastewater Treatment Design
Winter, 2011

1. INSTRUCTOR: Sheng Chang

Office: Room 219, **Extension:** 56619,

Email: schang01@uoguelph.ca

Office hrs: Tuesday and Thursday 1:30-2:30 or by appointment.

2. TEACHING ASSISTANTS: Zebo Long; Rollings-Scattergood, S.

Email: zlong@uoguelph.ca; srolling@uoguelph.ca

3. TEXTBOOK

Viessman, W. Jr., Hammer, M.J., Perez, E.M., and Chadik, P.A., (2009) Water Supply and Pollution Control (Third Edition). Pearson Prentice Hall, Upper Saddle River, NJ,

Other course references will be posted on the course webpage or with teaching materials.

4. PREREQUISITES:

ENGG3100; ENGG3590

Note: if you do not meet these requirements, see the instructor immediately

5. SCHEDULE:

Lectures: Room CRSC 116

Monday: 9:30 AM - 10:20 AM

Wednesday: 9:30 AM - 10:20 AM

Friday: 9:30 AM - 10:20 AM

Tutorials: ROOM MACK 235

Section 0101: Wednesday: 03:30 PM - 05:20 PM

Section 0102: Thursday: 12:00 PM - 01:50 PM

Tutorials start in the week of **January 18, 2011**.

Midterm: Thursday: 12:20 to 1:50 PM, March 3, 2011

Final EXAM: Tues, 07:00PM - 09:00 PM, April 12, 2011

6. COURSE CONTENTS**Course Objective:**

The purpose of this course is to provide the students with theories and practices of the process design of the water and wastewater treatment processes. Emphasis will be placed on treatment process principles, equipment, public water and wastewater work design standards, process design methods, and integrating individual unit operations and processes to achieve multiple treatment objectives. On successful completion of this course, you will be able to:

- properly identify the critical issues and challenges in planning, design and operation of water and wastewater treatment facilities to meet regulatory requirements,
- develop extensive understanding of the process principles and design methods of water and wastewater treatment processes;
- develop reasonable working knowledge and hands-on experiences that can be used to devise and design the efficient, cost-effective treatment systems, and
- gain the independent learning skills and enhanced team-work ability.

Course description:

This course is designed as a senior undergraduate course for the School of Engineering. The goal of this course is to provide students with comprehensive background, approaches, and skills for water and wastewater process design through lecturing and design project practicing.

The lectures are aimed to introduce students with systematic theories and design methods of water and wastewater treatment processes. The water process design will cover water chemistry basics, coagulation/flocculation, sedimentation, filtration, disinfection, and plant hydraulic calculations. The wastewater treatment process design will focus on the activated sludge processes with contents on (1) an introduction to the fundamental biological process principles, (2) aeration process theory and design, (3) process principles and design of activated sludge processes, and (4) wasted sludge treatment.

The water treatment process design project will cover process design of the coagulation, flocculation, sedimentation, deep-bed filtration, disinfection, and plant hydraulics calculation. The wastewater treatment process design project will focus on the aeration and activated sludge process design.

The students are required to form project design teams and be actively engaged in the team activities. The maximum group size is four students and the member of the two projects could be different. All the students are required participating the project throughout the course of the projects. The final project mark for each member of a group could be different, depending on his/her participation and performance within the group.

7. GRADE EVALUATION:

Water treatment design project (2 submissions) 30%

Wastewater design project (1 submission) 15 %

Midterm (1) 15 %

Final exam 40%

Note: All the quizzes and final exam will be open-book. You are allowed to bring the specified textbook, the course notes and non-communicate calculator but not the submitted project reports and assignments.

8. IMPORTANT NOTES**Student responsibilities**

- Attend lectures, tutorial, and group meeting in order to obtain all the course material that you are responsible for.
- Check announcements page on a regular basis.
- Submit assignments on time.
- Submission of assignments for re-marking must be done within a week of being returned.
- Communications regarding this course will frequently involve the course web page and email. Students are responsible for checking the course website and the university email account for all instructions and announcements. This must be done at least once every week.

Late Assignment/project report policy:

- Generally, when you find yourself unable to meet a course requirement such as an assignment or a test as a result of compassionate, illness or physiological reasons, a formal explanation must be made in writing to the instructor and (where possible) proper documentation must be provided. This should be done prior to an exam or assignment (if possible) or as soon as possible but definitely within a week after the exam or assignment due date.
- If no explanations are provided, exams receive a grade of zero and project reports are subject to the following deductions:
 - 25% will be deducted if the assignment is up to 24 hours late,
 - 50% will be deducted if the assignment is 24 to 48 hours late,
 - No assignments will be accepted after that.

University policy on academic misconduct:

Academic misconduct, such as plagiarism, is a serious offence at the University of Guelph. Please consult the Undergraduate Calendar 2008-2009 and School of Engineering programs guide, for offences, penalties and procedures relating to academic misconduct.

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Disclaimer:

The instructor reserves the right to change any or all of the above in the event of appropriate circumstances, subject to the University of Guelph Academic Regulations