

**Department of Civil and Environmental Engineering  
Carleton University**

**ENVE 4005 WASTEWATER TREATMENT PRINCIPLES AND DESIGN**

**Fall 2020**

**Instructor:** Prof. Banu Örmeci, Jarislowsky Chair in Water and Health

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**Office hours for Prof. Örmeci:** TBD

**Reference text books**

These books are available in the library and you are not expected to purchase them.

1. Wastewater Engineering: Treatment and Reuse.  
Metcalf & Eddy, Inc. Revised by George Tchobanoglous, Franklin L. Burton, and H. David Stensel. Publisher: McGraw-Hill.
2. Wastewater Treatment Plant Design.  
Edited by P. Aarne Vesilind. Publisher: Water Environment Federation and IWA Publishing.
3. Water and Wastewater Calculations Manual. Shun Dar Lin, Publisher Mc-Graw Hill.

**Course Outline**

<b>Week</b>	<b>Subject</b>
Week 1	Introduction to wastewater treatment
Week 2	Wastewater characteristics and flow rates, Lab
Week 3	Preliminary treatment
Week 4	Primary treatment, Lab
Week 5	Chemical unit processes
Week 6	Aerobic biological treatment processes, Lab
Week 7	Anaerobic biological treatment processes
Week 8	Advanced wastewater treatment, Lab
Week 9	Disinfection processes
Week 10	Biosolids treatment and disposal, Lab
Week 11	Decentralized and on-site wastewater treatment
Week 12	Presentation of the design projects

**Grading**

Mid-term	30%
Final	40%
Laboratory reports	15%
Design project	15%

## **Teaching**

Classes will be taught online via Zoom. Recorded lectures will be made available to students as well as the teaching material.

## **Labs**

Labs will be online and the data will be provided to groups.

## **Lab reports**

Your reports should have the following parts: Introduction, Materials and Methods, Results, Discussion, and Conclusions. Experimental data will be shared within a group and each group will submit one report. Sharing data, graphs, reports with other groups is not allowed.

## **Design Project**

Consulting firms (teams of three to four students) will work on the design project together. The design project consists of four reports and a final presentation. You can work with your team members and share data and calculations; however, the submitted report (maximum 2 pages of text, single space, font size 12 - excluding supporting graphs and figures) needs to be your own work. Sample calculations should be included in the Appendix. You will evaluate your team members based on effort and contribution at the end of the term.

## **Late policy**

For each late design project or laboratory report, 5% of the grade will be deducted for everyday late. Weekends are included.

## **Special arrangements**

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

### *Pregnancy obligation*

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website:  
[carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

### *Religious obligation*

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website:  
[carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

*Academic Accommodations for Students with Disabilities*

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your *Letter of Accommodation* at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website ([www.carleton.ca/pmc](http://www.carleton.ca/pmc)) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*). “

#### *Survivors of Sexual Violence*

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: [carleton.ca/sexual-violence-support](http://carleton.ca/sexual-violence-support)

#### *Accommodation for Student Activities*

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

<https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: [students.carleton.ca/course-outline](http://students.carleton.ca/course-outline)