Carleton University  
The Department of Civil and Environmental Engineering  

ENVE 3001 Water Treatment Principles and Design  

Course Objectives: To present theoretical and practical aspects of unit operations for water treatment with design applications. Topics include water characteristics and contaminants, coagulation, flocculation, sedimentation, filtration, adsorption, ion exchange, disinfection and disinfection by-products, and management of water treatment residuals. Laboratory procedures: water characteristics, and specific unit processes covered in the lectures  

Course Instructor:  Dr. Onita Basu (ME 2366)  
Email contact:  onita.basu@carleton.ca  

Course Lectures:  Tuesday & Thursday , 2:30 pm to 3:55 pm (online – synchronous only)  
Course Labs:  There will be 4 labs this term – content will be (online - asynchronous)  
Course PA:  Mon 11:35 am to 12:25 am (online - mixed)  

This is a BLENDED COURSE –  
“An online course where there is a mixture of synchronous meetings and asynchronous activities. This means students need to be prepared to meet some of the time online via web conferencing tools at scheduled days and times. The specific dates will be communicated by the instructor in the course outline. The asynchronous activities are intended to provide flexibility to students when the class is not meeting synchronously. Students are expected to remain up to date with the deadlines and due dates provided by the instructor. These courses require reliable high-speed Internet access and a computer (ideally with a webcam), and a headset with a microphone.”  

Teaching Assistant: TBD  
Emails: tba  

Text:  
Course Notes – on CULEARN  

Topics to be covered in this course:  

- Intro to Water Treatment  
- Water Quality Characteristics  
- Coagulation and Flocculation  
- Sedimentation  
- Filtration  
- Adsorption  
- Ion Exchange/Softening  
- Water Disinfection
• Water Residuals (time permitting)
• Special Topics

Reference Books: (Suggested but not limited to)
1. Author/Publisher: Montgomery Hill Watson (MWH)
   Title: Water Treatment: Principles and Design.
   Year: 2012
   Available – online through the library

The library database has several Water Treatment Textbooks – just enter “Water Treatment” into the search.

If you are looking for a journal article – the following journals are recommended (the list is not exhaustive but is a good starting point if you are new to the field):
• Water Research
• Chemosphere
• Journal of Water Process Engineering
• Journal of Separation and Purification
• Science of the Total Environment

Grading:

Lab Reports = 15%
Assignments = 20%
Midterm = 20%
Final Exam = 45%

There are 5 assignments in total. Assignments 1-4 are to be submitted in groups of 2 or 3 (no individual submissions), assignment 5 is an oral presentation with a short write up on a water related topic.
There are 4 labs in total. Each lab has an individual pre-lab. Lab Reports are to be submitted in groups of 2-3.

Additional Notes:
Information (lecture material, lab notes, etc) for the course will be posted on WebCT.

What happens if an assignment/lab is late? You will receive a 10% deduction from the overall mark for the first 24 hours. You will receive a mark of zero after that.

What happens if I miss the Midterm? You will receive a mark of zero if you do not discuss with the instructor before hand or cannot produce a valid Doctors Notes within 3 days of the midterm.

Following faculty practice, the final examination papers will not be returned after marking. A minimum mark of 45% on the final exam is required to pass the course.
Lab Comments:
- Labs are approximately biweekly.
- Individual Prelabs – are due via online submission no later than the start of the online lab access.
- Group Lab Reports – lab reports are submitted by groups of 2-3 people. The group lab reports are expected to include the following sections: Introduction/Background Section, Results, Discussion, and Conclusion. For some labs, data between groups will be pooled for analysis.
- Poorly constructed labs will be rejected. Labs must include at least two references from a text book or journal article related to the introduction and background writeup (this is in addition to the course notes).

Requests for 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 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) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Requests for Academic Accommodation for Religious Obligations
Students requesting academic accommodation on the basis of religious obligation should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student.

Requests for Academic Accommodation for Pregnancy:
Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required.