New York University Tandon School of Engineering  
Department of Civil and Urban Engineering  
CE-UY 3223 Environmental Engineering 1  
Fall 2017  
Professor Andrea Silverman  
Lab Instructor Jeong Eun Ahn  
Tuesday & Thursday 4:00 PM – 5:20 PM; JAB 674  

To contact professor: andrea.silverman@nyu.edu  
Rogers Hall, Room 405 B  
Office hours: Tuesday 2-3 pm; or by appointment  

Course Pre-requisites: CE-UY 2213 Fluid Mechanics and Hydraulics or equivalent  

Course Description: This course will introduce students to a range of areas within environmental engineering, and provide tools for analysis of environmental engineering problems. Topics include materials balance, ideal reactor models, environmental chemistry, public health risk assessment, air quality, water quality, drinking water treatment, wastewater treatment, and laboratory analysis of water and wastewater samples and treatment processes.  

Course Objectives  
1. Apply environmental engineering principles – including material balance, basic reaction kinetics, and environmental chemistry – to solve environmental engineering problems.  
2. Understand and apply environmental regulations, and comprehend the risk and impact of pollution generated by human activity on human and ecosystem health.  
3. Understand surface and groundwater pollution, as well as air pollution, and apply engineering principles to analyze environmental problems.  
4. Develop the ability to analyze major unit processes in drinking water treatment systems, and design basic unit operations.  
5. Recognize and identify the science and engineering principles behind wastewater treatment processes.  
6. Understand global atmospheric change and the need for solid waste management.  

ABET Student Outcomes  
1. An ability to apply knowledge of mathematics, science, and engineering.  
2. An ability to design and conduct experiments, as well as to analyze and interpret data.  
3. An ability to identify, formulate, and solve engineering problems.  
4. An ability to communicate effectively.  
5. Knowledge of contemporary issues.  
6. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.  

Course Structure  
Lecture: Tuesday & Thursday 4:00 PM – 5:20 PM  
Laboratory (RH 415): Wednesday 11:30 AM – 2:20 PM OR Friday 8:00 AM – 10:50 AM
Readings
2. Lab Material (will be provided)
3. Additional Texts (optional):

Course requirements

1. **Lecture:** regular, on-time class attendance is required – attendance will be taken at every class session. NO CELLPHONES or LAPTOPS are allowed in class.

2. **Readings:** readings from the Masters & Ela textbook will be assigned each week (see course schedule below).

3. **Problem Sets:** problem sets will typically be assigned on Thursday of each week. Problems sets will be due one week after they are assigned and should be turned in at the beginning of class. You are expected to work independently on your homework assignments, though you may consult with Prof. Silverman or fellow students to determine how to approach problems.

4. **Laboratory:** students are required to attend all laboratory sessions – see below for the laboratory schedule. Each laboratory has a required laboratory report, which is due one week after the laboratory and should be turned in at the beginning of the laboratory session. Each student must turn in their own assignment.

5. **Late Policy:** late assignments will be docked 10% for each day they are late (the weekend counts as one day).

6. **Exams:** there will be one midterm and one final exam. Exams are closed-book. The midterm is in class on **Tuesday, October 24, 2017**. The final exam date and time will be announced by the registrar.

7. **Class Website:** the syllabus, lecture and laboratory schedule, homework assignments, and lab materials will be posted on the NYU Classes course website.

8. **Grading:**
   - Problem Sets 20%
   - Laboratory Assignments 20%
   - Midterm Exam 30%
   - Final Exam 30%
# Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Tues.</th>
<th>Lecture Topic</th>
<th>Thurs.</th>
<th>Lecture Topic</th>
<th>Reading</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9/5</td>
<td>Intro, Units of Measure</td>
<td>9/7</td>
<td>Mass Balance, Kinetics</td>
<td>Ch. 1.1 – 1.3</td>
<td>No Lab</td>
</tr>
<tr>
<td>2</td>
<td>9/12</td>
<td>Reactor Models</td>
<td>9/14</td>
<td>No Class (AEESP Lecture-NJIT)</td>
<td>Ch. 1.3</td>
<td>Intro, pH, EC</td>
</tr>
<tr>
<td>3</td>
<td>9/19</td>
<td>Env. Chemistry – intro, acid/base</td>
<td>9/21</td>
<td>Env. Chemistry – solubility product, Henry’s law</td>
<td>Ch. 2.1 – 2.2, 2.4 – 2.5</td>
<td>Reaction Kinetics</td>
</tr>
<tr>
<td>4</td>
<td>9/26</td>
<td>Env. Chemistry – carbonate system</td>
<td>9/28</td>
<td>Env. Chemistry</td>
<td>Ch. 2.4 – 2.5</td>
<td>Alkalinity and Hardness</td>
</tr>
<tr>
<td>5</td>
<td>10/3</td>
<td>Risk Assessment</td>
<td>10/5</td>
<td>Properties of Water</td>
<td>Ch. 4, 5.1 – 5.2</td>
<td>Ion Exchange</td>
</tr>
<tr>
<td>6</td>
<td>10/10</td>
<td>Water Pollution – pathogens, salts</td>
<td>10/12</td>
<td>Water Pollution – metals, BOD, nutrients</td>
<td>Ch. 5.3 – 5.5</td>
<td>BOD I</td>
</tr>
<tr>
<td>7</td>
<td>10/17</td>
<td>Water Pollution – org. contaminants, regulations</td>
<td>10/19</td>
<td>Water Pollution – rivers, lakes, groundwater</td>
<td>Ch. 5.6 – 5.11, 5.16-5.17</td>
<td>BOD II</td>
</tr>
<tr>
<td>8</td>
<td>10/24</td>
<td>MIDTERM</td>
<td>10/26</td>
<td>Water Quality Control</td>
<td>Ch. 6.1 – 6.3</td>
<td>No Lab</td>
</tr>
<tr>
<td>9</td>
<td>10/31</td>
<td>Water Quality Control</td>
<td>11/2</td>
<td>Water Quality Control</td>
<td>Ch. 6.4</td>
<td>Newtown Creek</td>
</tr>
<tr>
<td>10</td>
<td>11/7</td>
<td>Water Quality Control</td>
<td>11/9</td>
<td>Water Quality Control</td>
<td>Ch. 6.4 – 6.5</td>
<td>Coagulation</td>
</tr>
<tr>
<td>11</td>
<td>11/14</td>
<td>Special Topic – Natural treatment systems</td>
<td>11/16</td>
<td>Air Quality</td>
<td>Ch. 7.1 – 7.2</td>
<td>Solids</td>
</tr>
<tr>
<td>12</td>
<td>11/21</td>
<td>Air Quality</td>
<td>11/23</td>
<td>No class (Thanksgiving)</td>
<td>Ch. 7.3 – 7.5</td>
<td>No Lab</td>
</tr>
<tr>
<td>13</td>
<td>11/28</td>
<td>Air Quality</td>
<td>11/30</td>
<td>Global Atmospheric Change – GHG</td>
<td>Ch. 7.7 – 7.9</td>
<td>Adsorption</td>
</tr>
<tr>
<td>14</td>
<td>12/5</td>
<td>Global Atmospheric Change – ozone hole</td>
<td>12/7</td>
<td>Special Topic - TBD</td>
<td>Ch. 8.1 – 8.7</td>
<td>Current Events</td>
</tr>
<tr>
<td>15</td>
<td>12/12</td>
<td>No class (Monday schedule)</td>
<td>12/14</td>
<td>Wrap up</td>
<td>Ch. 8.13</td>
<td>No Lab</td>
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**Moses Center Statement of Disability**

If you are student with a disability who is requesting accommodations, please contact New York University’s Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.

**Religious Observance and Family Obligations**

Students who anticipate being absent because of religious observance or family obligations should, whenever possible, contact Prof. Silverman in advance of such anticipated absence.
NYU School of Engineering Policies and Procedures on Academic Misconduct

A. Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who breach the School’s rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School’s Policy on Academic Misconduct.

B. Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:

1. Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person’s work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.
2. Fabrication: including but not limited to, falsifying experimental data and/or citations.
3. Plagiarism: intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.
4. Unauthorized collaboration: working together on work that was meant to be done individually.
5. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.
6. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.