Registration info:  CE-GY 7703 | 3 units | Class#: 22434 | Session: 01/23/2017 - 12/12/2017 | Section: I
Class Status: Open | Grading: Grad Tandon Graded | Instruction Mode: In-Person
Course Location: Brooklyn Campus | Component: Lecture
01/23/2017 – 05/08/2017 Mon 6.00 PM - 8.30 PM at JABS 475 with Vasilidis, Haralambos

Class hours:  Monday 18:00–20:30
Classroom:  Jacobs Academic Building, Room 475 [JABS 475]

Instructor:  Professor Haralambos V. Vasilidis, Ph.D., P.E., DEE, D.WRE, CIH
Office:  RH____
Office hours:  Monday 20:30-21:30 and by appointment
Telephone:  917.488.0607 (preferably Monday thru Friday from 11:00 a.m. to 1:00 p.m. and from 4:00 p.m. to 5:00 p.m.)
Email:  HVasilidis@nyu.edu or HVV@att.net (please use only one)
Email specs:  Your subject title AND all attached filenames of your emails should have the following format
“CE-GY7703-SP17-<Lastname><FirstName><MiddleInitial>-<subject>”, e.g., “CE-GY7703-SP17-VasilidisHaralambosV-NotesheetA

Catalog Descr.:  The course covers engineering aspects of solid waste collection, transport and disposal, including incineration, sanitary landfill, composting, recovery and reutilization. Also covered is the economic evaluation of factors affecting selection of disposal methods.
Prerequisite:  Graduate Standing

References:  Posted on blackboard (a partial list is shown below)

Description:  Characterization of solid waste streams. Solid waste generation in municipal, commercial and industrial sectors. Waste minimization by waste reuse and recycling. Analysis of state-of-the-art reuse and recycling technologies. Economics of waste and its impact of reuse/recycling. Implementation of reuse and recycling technologies in major commercial and industrial sectors such as paper, glass, plastics, metals, wood, tire, electronics and construction/demolition wastes. Local, State and national legislative trends and regulatory requirements. Impact of reuse and recycling of wastes on CO₂ emissions, urban sustainability and global warming. Examples of public and private reuse and recycling programs in NY City.

Objectives:  The students completing this course will be expected to have acquired a broad analysis of implementing reuse and recycling in the municipal (minor), commercial and industrial (major) sectors in urban areas will be presented in this class. Environmental life cycle assessment of materials will be discussed. The technologies used to process materials for reuse and recycling will be examined with examples from major sectors. The environmental impact of such applications will be covered. Specialized reuse and recycling programs in New York City and other Cities in the US will be examined. Guest speakers will be invited to present programs of particular interest.
<table>
<thead>
<tr>
<th>No</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>Homework</th>
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<tbody>
<tr>
<td>1</td>
<td>Monday, January 23, 2017</td>
<td>Introduction to integrated solid waste management, sources and quantities</td>
<td>Ch. 1</td>
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<tr>
<td>2</td>
<td>Monday, January 30, 2017</td>
<td>Federal, State and City/Local legislation, (i.e., RCRA, CERCLA, TSCA, etc.)</td>
<td>Ch. 2, 3, and 4</td>
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<td>3</td>
<td>Monday, February 6, 2017</td>
<td>Solid waste stream characteristics – physical, chemical and microbiological properties</td>
<td>Ch. 5</td>
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<td>4</td>
<td>Monday, February 13, 2017</td>
<td>Collection of solid waste and landfilling – generation, handling, collection, identification/classification, storage, transport, treatment and disposal</td>
<td>Ch. 7 and 14</td>
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<tr>
<td>5</td>
<td>Monday, February 20, 2017</td>
<td>Presidents’ Day – No classes scheduled</td>
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<td>6</td>
<td>Monday, February 27, 2017</td>
<td>Hazardous and universal waste management</td>
<td>Ch. 10 and 11A</td>
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<td>7</td>
<td>Monday, March 6, 2017</td>
<td>Other special wastes management (incl. C&amp;D)</td>
<td>Ch. 11 [B, C, D and E]</td>
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<td>8</td>
<td>Monday, March 13, 2017</td>
<td>Spring Recess [03/13/2017 – 03/16/2017]: No classes scheduled</td>
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<td>9</td>
<td>Monday, March 20, 2017</td>
<td>Life-cycle financial analysis</td>
<td>Ch. 16</td>
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<td>10</td>
<td>Monday, March 27, 2017</td>
<td>MIDTERM EXAM – Chapters 1, 2, 3, 4, 5, 7, 10, 11, and 14</td>
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<td>11</td>
<td>Monday, April 3, 2017</td>
<td>Source quantity and toxicity reduction (including reuse)</td>
<td>Ch. 6 [A and B]</td>
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<td>12</td>
<td>Monday, April 10, 2017</td>
<td>Waste-to-energy combustion and emission control</td>
<td>Ch. 9</td>
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<td>13</td>
<td>Tuesday, April 17, 2017</td>
<td>Recycling</td>
<td>Ch. 8</td>
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<td>14</td>
<td>Monday, April 24, 2017</td>
<td>Markets and products for recycled materials</td>
<td>Ch. 12</td>
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<td>15</td>
<td>Monday, May 1, 2017</td>
<td>Composting of municipal solid wastes</td>
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<td>16</td>
<td>Monday, May 8, 2017</td>
<td>Other waste reuse and recycling options</td>
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<td>17</td>
<td>Monday, May 15, 2017</td>
<td>FINAL EXAM [Wednesday, May 10, 2017 - Tuesday, May 16, 2017] – Ch. 6, 8, 9, 12, 13 and 16</td>
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Grading Policy:

- Lecture/Preview Presentation: 5% [bonus]
- Product-Specific project: 20%
- Solid Waste Management project: 20%
- Mid-term exam: 30%
- Final Exam: 30%
- Other Assignments: to be announced [max 10% as bonus]

Reports:

For all reports, projects, assignments and other submittals use only 8½ “x11” paper [as shown below]. Cover pages are not needed. Staple all pages at the top left corner. On the top right corner of the first page of your assignments include your full name, homework assignment, problems solved partially and problems solved completely along with the date of submission. Underline your answers. Use proper graph paper for all graphs, sketches, designs, etc. which meet engineering standards. The overall appearance of your submittals is very important. All technical papers/reports should adhere to the ASCE guidelines for publication [http://ascelibrary.org/doi/pdf/10.1061/9780784479018]. You may use either international (SI) or English (EU) units.

All reports should be single spaced manuscripts with a minimum of 5 references to be listed at the end of the manuscript. Figures and tables can be scanned if appropriately referenced. Use only 8½ “x11” paper. Reports should include the following sections [reference: www.utah.edu, www.ute.edu, www.asce.org, etc.]:

a) Title Page – Title, Author, Organization, Date
b) Abstract – A brief (typically 200-word) description of project objectives including investigative methods used, research conclusions and/or applications, and a list of key words that describe the project and identify the major research concept(s).
c) Acknowledgements [optional] – One or two paragraphs
d) Table of Contents
e) List of Figures and Tables
f) List of Symbols, Variables/Parameters and Abbreviations/Acronyms
g) Introduction – One or two paragraphs
h) Literature Review and Background
i) Theory, Statement of Problem, Governing Principles, Equations, Legislation, etc., and Scope of Work
j) Experimental/Research Approach/Methodology and Details
k) Results – Discussion and Comparison
l) Summary, Conclusions and Recommendations
m) References
n) Appendices

Material borrowed or adapted from external sources must be identified and quoted (i.e., document, source, date and page). When referring to a specific figure or table, spell out and capitalize the words “Figure” and “Table”. Acronyms must be spelled out the first time used, followed by the acronym in parentheses.
Projects: Select one from each category (i.e., one topic from category 1 and one from category 2) and study all associated articles, manuals, etc. from the list of recommended references. By the day of the final exam you must submit electronic copies (in editable format and pdf) of both papers and presentations. Follow the above-described format for all submitted files, e.g., “CE-GY7703-SP17-VasiliadisHaralambosV-NotesheetA”

1. Product-Specific Research Project [individual]

Select a commonly used household or office product and propose it for further research and analysis with proper supporting documentation for review, comments and acceptance. Conduct a “cradle-to-grave” (life cycle) analysis of the product from a management point of view. You will make a 10-minute presentation [max. 15 slides] during a designated lecture. During your presentation, you will have to distribute four (4) copies of your report (max 2 sheets = 4 pages printed double-sided) including the following:

a. Executive summary [max. ½ page] - Describe the challenges and findings of your research.
b. Product [max. 1 page] - Include all physical, chemical, biological characteristics of the product including all active ingredients and typical waste management practices.
c. Alternative products [max. 1 page] - Recommend alternative products including all benefits and shortcomings
2. Environmental sustainability [max. 1 page] – Recommend future or innovative methods and practices to achieve environmental sustainability.

References [min. 5 references; max. ½ page]

2. Solid Waste Design/Analysis or Management Project

Select one of the following three (3) options. During your presentation, you will have to distribute four (4) copies of your report.

2.a. Solid Waste Treatment [individual]

Select one of the standard solid waste treatment methods (physical, chemical, biological, thermal) and propose it for further research and analysis with proper documentation for review, comments and acceptance. Conduct an in-depth research and prepare a synopsis of this method from a design point of view. You will make a 10-minute presentation [max. 15 slides] during a designated lecture. During your presentation, you will have to distribute four (4) copies of your report (max 2 sheets = 4 pages printed double-sided) including the following:

a. Executive summary [max. ½ page] - Describe the challenges and findings of your research.

b. Theory [max. 1 page] - Include all physical, chemical, biological characteristics of the selected method including all fundamental principles and governing equations of this method.

c. Design [max. 1 page] – Discuss all design parameters and design approach.

d. Environmental sustainability [max. 1 page] – Recommend future or innovative methods and practices to achieve environmental sustainability based on improvements on current method or alternatives.

References [min. 5 references; max. ½ page]

2.b. Integrated (Solid) Waste Management (IWM) [work in teams of 4]

Consider NYU as a case study and prepare an Integrated (Solid) Waste Management plan including all waste streams (recyclables and not), quantities (typical and range) and characteristics (physical, chemical, biological and radioactive). Refer to other types of waste (liquids, emissions, etc.) not managed as solid wastes. Include current management method and propose one that a) would promote and support waste reuse and/or waste recycling, b) would provide incentives for reuse/recycling of such materials/wastes through standard and innovative methods and techniques, and c) would be in compliance with all applicable codes and regulations. Finally, provide incentives for searching and adapting an innovative management method. Define clearly your objectives and all applicable constraints.

Conduct an in-depth research and prepare a synopsis of the proposed IWM plan from a management point of view. You will make a 20-minute presentation [max. 25 slides] during a designated lecture. During your presentation, you will have to distribute four (4) copies of your report (max 4 sheets = 8 pages printed double-sided) including the following:

a. Executive summary [max. ½ page] - Describe the challenges and findings of your research.

b. Current waste management plan evaluation [max. 4 page] - Include all aspects of current waste management plan

c. Proposed IWM plan [max. 4 pages] – Discuss all proposed changes and alternative options.

d. Environmental sustainability [max. 3 page] – Summarize all advancements in the field of environmental sustainability potentially achieved by your proposed management plan.

References [min. 5 references; max. ½ page]

2.c. Design of Municipal Waste Landfills and Incinerators [work in teams of 4]

Prepare a technical manual for the design of municipal solid waste landfills or incinerators (select one). You will make a 20-minute presentation [max. 25 slides] during a designated lecture. During your presentation, you will have to distribute four (4) copies of your report (max 6 sheets = 12 pages printed double-sided) including the following:

a. Executive summary [max. ½ page] - Describe the challenges and findings of your research.

b. Present a process diagram and discuss in detail all phases/stages, their characteristics and all governing theories and equations. [max. 4 page]

c. Present drawings with all design parameters and typical values included [max. 4 pages].

d. Environmental sustainability [max. 3 page] – Discuss all aspects of environmental sustainability need to be considered in such design.

References [min. 5 references; max. ½ page]

Assignments: Homework assignments are an important part of the learning process: they reinforce both concepts and computational skills. Be sure to allocate sufficient time. Although you are welcome and encouraged to discuss assignments with other students or with the instructor or graduate assistant, you must first make an effort to solve each problem by yourself. After any discussions about specific problems, you should prepare your assignment submittal independently – copied solutions violate the spirit of the learning process and the NYU-Poly Code of Conduct and appropriate academic dishonesty reporting will be implemented.
Homework should be submitted on 8½ x 11 inch paper - either engineering computation paper (preferred) or lightly-ruled graph paper. Cover pages are not required. All pages should be consecutively numbered and the entire assignment must be stapled at the top left corner. On the top right corner of the first page of your homework include your full name, homework assignment number, problems solved partially and problems solved completely along with the date of submission. Underline your answers. Use proper graph paper for all graphs, sketches, designs, etc. which meet engineering standards. The overall appearance of your submittals is very important. Loose-leaf or other horizontally-ruled paper is not recommended as they are not standard in professional use. Computational problems can be done by hand as long as handwriting is legible.

If a spreadsheet is used for calculations, a printout must be fully annotated so someone familiar with the course material can follow your computations. At a minimum, all rows and columns should be labeled with both variable names and units, and relevant equations should be provided either on the tabular printout or on a separate sheet of paper. Hand-written sample calculations must also be provided for all numerical values in a typical row (not the first row) of the table – write the equation using variables, show all relevant numerical values plugged in, then calculate the answer using your calculator to make sure it agrees with the number calculated by the spreadsheet.

Presentation: Each group (consisting of 2 students) will be responsible to make one PowerPoint presentation covering the material presented in the previous lecture. The presentation will take place in the beginning of the class (review period) and should last for 10 minutes including followed by a Q&A period. Each group will be responsible to prepare slides for everything covered in class. However, due to time limitations, the actual presentation must be limited to a maximum of 10 or 12 slides in order to be presented properly within 10 minutes. By the end of the semester, all presentations will be available to all students.

Exams: There will be two (2) exams (one midterm and one final exam). Exams will be based on lecture material, homework assignments and projects. Specific topics for each exam will be announced in class in advance. The examinations may consist of short-answer questions, true/false questions, numerical problems and essay questions. All exams will be closed book and notes. You may bring with you 2 sheets (8.5"x11") of notes (i.e., 4 pages) for the midterm exam and 4 sheets (i.e., 8 pages) for the final exam but you are not allowed to include any numerical examples. I may ask you to email me electronic copies of your notesheets. In addition, you may bring copies of tables and conversions (maximum 2 pages for each exam). Your exam notes will be reviewed in the beginning of each exam. Each set of exam sheets may receive up to 3 bonus points for its completeness, integrity and presentation. Typed exam notes will receive one (1) extra bonus point. During the exams, you are allowed to use calculators, rulers, pens/pencils and erasers. However, you are not allowed to use cell phones, computers (including notebooks, netbooks, ipads, etc.) or other electronic devices.

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.

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 these 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.