Spring 2024

EVSC 125-002: Fundamentals of Envr Sciences

Bonchonsky Michael

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EVSC 125-002 Fundamentals of Environmental Science:

Spring 2024 Course Syllabus

E-mail: michael.p.bonchonsky@njit.edu; also at mickbon@aol.com
Class to be held live (or other as may be announced) at the start of semester W and F 1-2:20 PM, FMH Rm 106
The course materials are posted on Canvas go to https://njit.canvas.com
Office Hours: right before and after class Wed (11-1, and 2:30-3:00) and before class Fri (11-1) right and by Webex appt

NJIT Academic Integrity Code: All Students should be aware that the Department of Chemistry & Environmental Science takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor. See Policy below

Ethics: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

COURSE INFORMATION

I. Course Description and Objectives Summary:

An introductory course to the interdisciplinary study of the complex interactions that occur among and within environmental systems: air, water, and terrestrial environs. The course includes an emphasis on anthropocentric effects on these environmental systems. It is provided as a part of a curriculum in applied environmental science and as such emphasizes problem identification and engineered solutions. The course serves as an introduction to further advanced study specializing in environmental science and engineering.

Number of Credits: 3 Cr
Prerequisites: None
Course-Section and Instructors

<table>
<thead>
<tr>
<th>Course-Section</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVSC 125 WF 1-2:20PM; FMH 106, live, materials posted on Canvas</td>
<td>MP Bonchonsky</td>
</tr>
</tbody>
</table>
Office Hours for All Chemistry & Environmental Science Instructors: Spring 2024 Office Hours as above
Required Textbook:

<table>
<thead>
<tr>
<th>Title</th>
<th>Environmental Science as a Living Planet, Botkin and Keller, 9th edition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
<td>Botkin and Keller</td>
</tr>
<tr>
<td>Edition</td>
<td>9th</td>
</tr>
<tr>
<td>Publisher</td>
<td>Wiley</td>
</tr>
</tbody>
</table>

University-wide Withdrawal Date: The last day to withdraw is as shown on the NJIT academic calendar currently listed as Monday, April 1, 2024. It will be strictly enforced.

Learning Outcomes:

Student learners will:

- Learn core concepts and methods from natural and physical sciences and their application in environmental problem solving.
- Understand the transboundary character of environmental problems and ways of addressing them, including interactions across local to global systems.
- Analyze basic public works and private systems that provide potable water, treat wastewater and manage air quality
- Demonstrate an ability to communicate effectively in written and oral form, demonstrating the ability to create an appropriate annotated bibliography and the ability to use effective presentation skills.
- Develop a sense of community responsibility by becoming aware of scientific issues in the larger social context.
- Demonstrate interpretative skills including the ability to analyze data, assess reliability, interpret results and draw reasonable conclusions.
- Become well-grounded in laws and theories of basic scientific disciplines by demonstrating and applying the scientific method.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
- Develop and incorporate standards of professional behavior that include rules of ethics and etiquette.

The course EVSC 125 covers these overarching topics:

- Introduction to Science
- The natural environment and population
- Energy and the environment
- The aqueous environment
- The terrestrial environment
- The air environment
- Industrial impacts and sustainability

POLICIES

All EVSC students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.

Grading Policy: The final score in this course will be determined as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essays</td>
<td>20%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20%</td>
</tr>
<tr>
<td>Participation</td>
<td>5%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>
The final course grade will be determined as follows:

<table>
<thead>
<tr>
<th>Final Grade</th>
<th>Overall Academic Performance (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 and above</td>
</tr>
<tr>
<td>B+</td>
<td>85-89</td>
</tr>
<tr>
<td>B</td>
<td>80-84</td>
</tr>
<tr>
<td>C+</td>
<td>75-79</td>
</tr>
<tr>
<td>C</td>
<td>70-74</td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
</tr>
<tr>
<td>F</td>
<td>Below 60</td>
</tr>
</tbody>
</table>

**Attendance Policy:** Attendance at classes will be recorded and is mandatory. Each class is a learning experience that cannot be replicated through simply “getting the notes.”

**Homework Policy:** Homework is an expectation of the course. The homework assignments set by the instructor are used in class discussions which comprise in part the determination of the score for “participation”.

**Exams:** There will be quizzes, a midterm exam held in class during the semester and one final exam. The following exam periods are tentative and therefore possibly subject to change (see Canvas for any updates):

<table>
<thead>
<tr>
<th>Midterm Exam</th>
<th>See Canvas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>Dates as shown on Canvas</td>
</tr>
<tr>
<td>Final Exam Period</td>
<td>May 3-9, see Registrar exam schedule</td>
</tr>
</tbody>
</table>

**Makeup Exam Policy:** There will normally be NO MAKE-UP QUIZZES OR EXAMS during the semester. In the event that a student has a legitimate reason for missing a quiz or exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor’s note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed so that appropriate steps can be taken to make up the grade.

**Cellular Phones:** All cellular phones and other electronic devices must be switched off during all class times. Such devices must be stowed in bags during exams or quizzes.

**NJIT Academic Integrity Code:** All Students should be aware that the Department takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor. Students are asked to practice extra care and attention in regard to academic honesty, with the understanding that all cases of plagiarism, cheating, multiple submission, and unauthorized collaboration are subject to penalty. Students must properly cite and attribute all sources used for papers and assignments. Students may not collaborate on exams or assignments, directly or through virtual consultation, unless the instructor gives specific permission to do so. Posting an exam, assignment, or answers to them on an online forum (before, during, or after the due date), in addition to consulting posted materials, constitutes a violation of the university’s Honesty policy. Likewise, unauthorized use of live assistance websites, including seeking “expert” help for specific questions during an exam, can be construed as a violation of the honesty policy. All students should be familiar with the **NJIT Academic Integrity Code**
ADDITIONAL RESOURCES

Accommodation of Disabilities: Office of Accessibility Resources and Services (formerly known as Disability Support Services) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at: 
  ● http://www5.njit.edu/studentsuccess/disability-support-services/

Important Dates (See: always check Spring 2024 Academic Calendar, Registrar)

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 17, 2024</td>
<td>First Day (Wed.) of Class for this course</td>
</tr>
<tr>
<td>January 22</td>
<td>Last Day to Add/Drop Classes</td>
</tr>
<tr>
<td>April 1</td>
<td>Last Day to Withdraw</td>
</tr>
<tr>
<td>March 10-16</td>
<td>Spring Break - University Closed</td>
</tr>
<tr>
<td>April 30</td>
<td>Last Day of Classes</td>
</tr>
<tr>
<td>May 3-9</td>
<td>Final Exam Period</td>
</tr>
</tbody>
</table>

Course Outline

(please see Canvas course website for any changes and updates during the semester)

Lecture topics, dates shown on Canvas website:

Week 1 (Class starts W Jan 17, 2024- F Jan 19) Introduction to Environmental Science…review of syllabus, assignments, selected readings; introduction to environmental science, relationship to traditional disciplines of study, and its applications in the real world today.

Week 2 (Jan 24, 26) Biomes: major ecological systems of the world; review of interrelationships of organisms and habitats; adaptation and evolution principles.

Week 3 (Jan 31, Feb2) Energy in the Natural Environment
  - Energy and Cycles of Energy in Nature
  - Basic metabolic processes: photosynthesis and respiration

Week 4 (Feb 7, 9) Energy in the Anthro- Environment
  - Principles of energy
  - First and Second Laws of Thermodynamics
  - Conservation of Energy and examples of Entropy, as found in environmental systems
  - Sources and Forms of Energy Development
    - Fossil Fuels
    - Nuclear Fuels
  - Alternative Energy Development Patterns
    - Advantages and Disadvantages of alternatives
  - Existing Energy Infrastructure
  - Energy for the future, renewable energy sources
  - Energy Use in Industrial Societies
  - Energy Consumption in the United States
  - Comparative Energy Use Internationally
  - Nonrenewable Energy Sources
Renewable Energy Sources

Week 5 (Feb 14, 16) Population Quiz (See Canvas details)

- Age structure diagrams
- Total Fertility rate, Birth rates
- Human Population Dynamics
- Demographic transition

Week 6 (Feb 21, 23) Water Quality

- The water molecule
- The hydrologic cycle
- Quantity and Quality of Water Resources
- Surface water, groundwater characteristics
- Algal Nutrients and Eutrophication
- Basic Examination of Water and Wastewater Problem set

Week 7 (Feb 28, Mar 1) February Water Pollution

- Sources of Pollution
- Parameters and Constituents
- Related measurements

Week 8 (March 6-8) Midterm Review and Exam week MidT: Mar 8, 2024 (see Canvas)

Week 9 Spring Break March 10-16

Week 10 (March 20, 22) Basic Water and Wastewater Treatment Systems

- Biological Systems
- Chemical Physical Systems
- Health Impacts and concerns

Week 11 (March 27, 29) Terrestrial and Groundwater Environment

- Groundwater Hydrology Contaminants, Transport
- Land Resources and Conservation
- Soils and their preservation
- Minerals: reserves and consumption
- Chemical and physical properties of soil
- Soil Matrix Systems
- Land Disposal of Solid Waste
- Fate of Pollutants in Soil Matrix
- Wetlands Impacts

Week 12 (April 3, 5) Atmospheric Environment Problem set

- Atmospheric Strata and Quality of Atmosphere
- Fate of Chemicals in the Atmosphere
- Indoor Air Pollution
- Global Warming, Greenhouse Effect
- Hydrocarbons and Photochemical Smog
- Industrial Air Pollution Control Systems

Week 13 (April 10, 12) Hazardous Waste… Quiz (See Canvas)

- Identification of hazardous waste
- Resource Conservation and Recovery Act
- Hazardous waste management
- Treatment and Remediation
Week 14 (April 17, 19) Recycling, Solid Waste

- Status of community practices
- Global developments in waste handling

Week-15 (April 24, 26) Sustainable Development

- Consumerism
- Biological Systems and Biodiversity
- Global Changes Trends
- “Tragedy of the Commons”/Environmental Impact Statements

Week-16 (Tues April 30, 2024) (Fri classes meet) last day of classes and review

- Finals Week begins as scheduled by registrar, exam schedule beginning May 3 to May 9

*Updated by MPB - 2024*

Department of Chemistry & Environmental Sciences
Course Syllabus, Spring 2024

Spring 2024 Academic Calendar

<table>
<thead>
<tr>
<th>Month</th>
<th>Date</th>
<th>Day</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>15</td>
<td>Monday</td>
<td>Martin Luther King, Jr. Day</td>
</tr>
<tr>
<td>January</td>
<td>16</td>
<td>Tuesday</td>
<td>First Day of Classes</td>
</tr>
<tr>
<td>January</td>
<td>20</td>
<td>Saturday</td>
<td>Saturday Classes Begin</td>
</tr>
<tr>
<td>January</td>
<td>22</td>
<td>Monday</td>
<td>Last Day to Add/Drop a Class</td>
</tr>
<tr>
<td>January</td>
<td>22</td>
<td>Monday</td>
<td>Last Day for 100% Refund, Full or Partial Withdrawal</td>
</tr>
<tr>
<td>January</td>
<td>23</td>
<td>Tuesday</td>
<td>W Grades Posted for Course Withdrawals</td>
</tr>
<tr>
<td>January</td>
<td>29</td>
<td>Monday</td>
<td>Last Day for 90% Refund, Full or Partial Withdrawal, No Refund for Partial Withdrawal after this date</td>
</tr>
<tr>
<td>February</td>
<td>12</td>
<td>Monday</td>
<td>Last Day for 50% Refund, Full Withdrawal</td>
</tr>
<tr>
<td>March</td>
<td>4</td>
<td>Monday</td>
<td>Last Day for 25% Refund, Full Withdrawal</td>
</tr>
<tr>
<td>March</td>
<td>10</td>
<td>Sunday</td>
<td>Spring Recess Begins - No Classes Scheduled - University Open</td>
</tr>
<tr>
<td>March</td>
<td>16</td>
<td>Saturday</td>
<td>Spring Recess Ends</td>
</tr>
<tr>
<td>March</td>
<td>29</td>
<td>Friday</td>
<td>Good Friday - No Classes Scheduled - University Closed</td>
</tr>
<tr>
<td>March</td>
<td>31</td>
<td>Sunday</td>
<td>Easter Sunday - No Classes Scheduled - University Closed</td>
</tr>
<tr>
<td>April</td>
<td>1</td>
<td>Monday</td>
<td>Last Day to Withdraw</td>
</tr>
<tr>
<td>April</td>
<td>30</td>
<td>Tuesday</td>
<td>Friday Classes Meet</td>
</tr>
<tr>
<td>April</td>
<td>30</td>
<td>Tuesday</td>
<td>Last Day of Classes</td>
</tr>
<tr>
<td>May</td>
<td>1</td>
<td>Wednesday</td>
<td>Reading Day 1</td>
</tr>
<tr>
<td>May</td>
<td>2</td>
<td>Thursday</td>
<td>Reading Day 2</td>
</tr>
<tr>
<td>May</td>
<td>3</td>
<td>Friday</td>
<td>Final Exams Begin</td>
</tr>
<tr>
<td>May</td>
<td>9</td>
<td>Thursday</td>
<td>Final Exams End</td>
</tr>
<tr>
<td>May</td>
<td>11</td>
<td>Saturday</td>
<td>Final Grades Due</td>
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<tr>
<td>May</td>
<td>TBA</td>
<td></td>
<td>Commencement</td>
</tr>
</tbody>
</table>