

Spring 2019

EVSC 125-002: Fundamentals of Environmental Science

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EVSC 125 Fundamentals of Environmental Science: *Spring 2019 Course Syllabus*

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Office Hours: T / F 1:00-2:30 and by 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.

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

Course-Section	Instructor
EVSC 125; TF 4-5:20 FMH 207	MP Bonchonsky

Office Hours for All Chemistry & Environmental Science Instructors: [Spring 2019 Office Hours and Emails](#)
Required Textbook:

Title	<i>Environmental Science as a Living Planet , Botkin and Keller, 9th edition</i>
Author	Botkin and Keller
Edition	9th
Publisher	Wiley
ISBN #	ISBN13: 978 1118427323 ISBN 10 1118427327

University-wide Withdrawal Date: The last day to withdraw is as shown on the NJIT academic calendar currently listed as Monday, April 8, 2019. It will be strictly enforced.

Learning Outcomes:

Student learners will:

- Learn core concepts and methods from ecological 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 scales.
- Analyze basic public works and private systems that provide potable water, treat wastewater and manage air quality
- Demonstrate their 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.

POLICIES

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

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

Essays	20%
Quizzes	20
Participation	5
Midterm Exam	25
Final Exam	30

The final course grade will be determined as follows:

Final Grade	Overall Academic Performance (100%)
A	Above 90
B+	85-89
B	80-84
C+	75-79
C	70-74
D	60-69
F	Below 60

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 moodle for any updates):

Midterm Exam	March
Quizzes	TBD on moodle
Final Exam Period	May

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.

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/studentuccess/disability-support-services/>

Important Dates (See: always check [Spring 2019 Academic Calendar, Registrar](#))

Date	Day	Event
January 22	T	First Day of Classes
February 1	F	Last Day to Add/Drop Classes
April 8	M	Last Day to Withdraw
April 10	F	No Friday Classes . Good Friday
March 17-24	week	Spring Break
May 7	T	Last Day of Classes
May 8-9	W, Tr	Reading Day
May 10-16	week	Final Exam Period

Course Outline

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

Lecture topics, dates:

Week 1 T, F January 22-25 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 January 29, Feb 1 Energy in the Natural Environment

Energy and Cycles of Energy

Week 3 February 5, 8 Energy in the Anthro- Environment (problems, assignments posted on Moodle)

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

Solar Energy: Passive Systems, Solar/Electric

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 4 February 12, 15 Water Quality (problem set posted on Moodle)

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 5 February 19, 22 Water Pollution

Sources of Pollution

Parameters and Constituents

Related measurements

Week 6 February 26, Mar 1 Basic Water and Wastewater Treatment Systems

Biological Systems

Chemical Physical Systems

Health Impacts and concerns

Week 7 March 5, 8 Presentations, Problems

Week 8 March 12, 15 Review and Midterm

Week 9 Spring Break March 17-24

Week 10 March 26, 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 11 April 2, 6 Atmospheric Environment (Problem set on moodle)

- 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 12 April 9, 12 Hazardous Waste

- Identification of hazardous waste
- Resource Conservation and Recovery Act
- Hazardous waste management
- Treatment and Remediation

Week-13 April 16, 19 Industrial Ecology

- The Law of Conservation of Mass, the continuity equation
- Properties of matter
- Advantages of Circular Systems over Linear Systems
- Conducting a Mass Balance, non-reacting and reacting systems
- Applications to Polluting Circumstances

Week-14 April 23, 26 Sustainable Development Chap 5

- Biological Systems, Major Biomes and Biodiversity
- Ecosystems
- Global Changes Trends
- “Tragedy of the Commons”/Environmental Impact Statements

Week-15 April 30, May 3 complete student presentations

Tuesday May 7, Problems and review ...last day of class...

Finals Week begins as scheduled starting Fri May 10