NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

EVSC 125-002 Fundamentals of Environmental Science:

Spring 2025 Course Syllabus

E-mail: michael.p.bonchonsky@njit.edu; bonchons@njit.edu
Class to be held live (or other as may be announced) at the start of semester W and F 10-11:20, FMH Rm 403
The course materials are posted on Canvas go to **https://njit.canvas.com**
Office Hours: right before and after class Tu and F (9:30-10, and 11:30-1:30) and by Zoom 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

---

This course expects students to work without artificial intelligence (AI) assistance in the preparation of and final form for all submitted assignments (test, quizzes, essays, discussion postings, for example) in order to better develop their skills in this content area. As such, for all submitted assignments, AI usage is not permitted throughout this course under any circumstance.

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

Course-Section	Instructor
EVSC 125 TF 10-11:20 AM; FMH 403, live, materials posted on Canvas	MP Bonchonsky

Office Hours for All Chemistry & Environmental Science Instructors: Spring 2024 Office Hours as above
Required Textbook:

Title	*Environmental Science as a Living Planet , Botkin and Keller, 9th edition*
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 7, 2025, 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:

Scores weighting	
Quizzes	20
Participation	10
Midterm Exam	30
Final Exam	40

The final course grade will be determined as follows:

Final Grade	Overall Academic Performance (100%)
A	90 and above
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 Canvas for any updates):

Midterm Exam	See Canvas
Quizzes	Dates as shown on Canvas
Final Exam Period	May 10-16, 2025, see Registrar exam schedule

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/studentsuccess/disability-support-services/

Important Dates (See: always check Spring 2025 Academic Calendar, Registrar)

Date	Event
January 21, 2025	First Day (Wed.) of Class for this course
January 27	Last Day to Add/Drop Classes
April 7	Last Day to Withdraw
March 16-226	Spring Break - University Closed
May 7	Last Day of Classes
May 10-16	Final Exam Period

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 Tu Jan 21, 2025-Fri Jan 24) 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 (Feb 4, 7) Biomes: major ecological systems of the world; review of interrelationships of organisms and habitats; adaptation and evolution principles.

Week 3 (Feb11, 14) Energy in the Natural Environment

Energy and Cycles of Energy in Nature
Basic metabolic processes: photosynthesis and respiration

Week 4 (Feb 18, 21) 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
    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 5 (Feb 18, 21) Population Quiz (See Canvas details)

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

Week 6 (Feb 25, 28) 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 (Mar 4, 7) February Water Pollution
Sources of Pollution
Parameters and Constituents
Related measurements

Week 8 (March 11,14) Midterm Review and Exam week MidT: Mar 14, 2025 (see Canvas)

Week 9 Spring Break March 16-23

Week 10 (March 25, 28) Basic Water and Wastewater Treatment Systems

Biological Systems
Chemical Physical Systems
Health Impacts and concerns

Week 11 (April 1, 4) 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 8, 11) 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 15, 18) Hazardous Waste… Quiz (See Canvas)

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

Week 14 (April 22, 25) Recycling, Solid Waste

Status of community practices
Global developments in waste handling

Week-15 (April 29, May 2) Sustainable Development

Consumerism
Biological Systems and Biodiversity
Global Changes Trends

"Tragedy of the Commons"/Environmental Impact Statements

Week-16 (Tues May 6, 2025) (Fri classes meet) last day of classes and review

Finals Week begins as scheduled by registrar, exam schedule beginning May 10-16 2025

Updated by MPB - 2025

Spring 2025 Academic Calendar

January	20	Monday	Martin Luther King, Jr. Day
January	21	Tuesday	First Day of Classes
January	25	Saturday	Saturday Classes Begin
January	27	Monday	Last Day to Add/Drop a Class
January	27	Monday	Last Day for 100% Refund, Full or Partial Withdrawal
January	28	Tuesday	W Grades Posted for Course Withdrawals
February	3	Monday	Last Day for 90% Refund, Full or Partial Withdrawal, No Refund for Partial Withdrawal after this date
February	17	Monday	Last Day for 50% Refund, Full Withdrawal
March	10	Monday	Last Day for 25% Refund, Full Withdrawal
March	16	Sunday	Spring Recess Begins - No Classes Scheduled - University Open
March	22	Saturday	Spring Recess Ends
April	3	Thursday	Wellness Day - No Classes Scheduled - University Open
April	7	Monday	Last Day to Withdraw
April	18	Friday	Good Friday - No Classes Scheduled - University Closed
April	20	Sunday	Easter Sunday - No Classes Scheduled - University Closed

May	6	Tuesday	Thursday Classes Meet
May	7	Wednesday	Friday Classes Meet
May	7	Wednesday	Last Day of Classes
May	8	Thursday	Reading Day 1
May	9	Friday	Reading Day 2
May	10	Saturday	Final Exams Begin
May	16	Friday	Final Exams End
May	18	Sunday	Final Grades Due
May	19	Monday	Master's and PhD Candidate Commencement - Bloom Wellness and Events Center
May	21	Wednesday	Undergraduate Candidate Commencement - Prudential Center