



Introduction to Environmental Science

Dr. Tareq Abuhamed
Suleiman Halasah

3 hours once a week. 3 credits **Undergraduate Level**

Course description

This course is designed to give an overview of environmental science, focusing on global environmental issues. The course will look at past and present environmental issues and the chemical and physical tools that assist in the study of the environment. The course will cover air pollution, the water cycle and environmental issues associated with water, hazardous substances, global warming, ozone depletion and acid rain. Each student will choose a specific topic to research and present to the class. There will be one field trip associated with the class.

Grade components

Class participation	8%
Quizzes	12%
Chemical of the Session	5 %
Paper	20%
Hands on projects reports	10%
Midterm	5%
Final exam	40%

Textbook for the course:

Chapters in: "Environmental Science" by Richard T. Wright, International Edition (9th)
Pearson-Prentice Hall (2005)

Session 1 - (1.5 hours)

Our planet – past and present environment; the atmosphere and the climate; natural and anthropogenic processes

Lecturer: Suleiman Halasah

Readings: "Environmental Science" by Richard T. Wright, International Edition (9th)
Pearson-Prentice Hall (2005), pages 1-21 and appendix C, pages 669-675

Discussion: Israel Jordan population growth and pollution

Discussion: is CO₂ sequestration realistic?

Session 2 - (3 hours) Guest lecturer: Dr Shmuel Brenner

Chemical and physical tools assisting environmental studies – the atomic structure, chemical bonding and chemical reactions

Lecturer: Dr. Shmuel Brenner

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 54-68, 320-347 and appendix B, pages 667-668

Session 3 - (3 hours)

The waste cycle – solid waste, hazardous waste, other types of wastes

The waste cycle – Recycling and the integrated solution to waste problems

Lecturer: Dr. Tareq Abu Hamed

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 490-511; 513-537

At the beginning of this session each student will present in 3 minutes her/his assignment selection

Discussion: Waste in Palestine and Israel

Discussion: Recycling culture comparison

Session 4 - (1.5 hour lecture and 1.5 hour hands on)

Understanding global issues; the greenhouse effect, the ozone layer depletion; acid rain phenomenon

Lecturer: Suleiman Halasah

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 348-401,

Hands on: 3 groups working on biogas, hydrogen production and the off grid village

Session 5 - (1.5 hour lecture and 1.5 hour hands on)

Chemical reactions in the atmosphere and the environmental impacts of fossil fuels. Climate change and introduction to renewable energy sources.

Hands on: 3 groups working on biogas, hydrogen production and the off grid village

At the beginning of this session each student will present in 3 minutes her/his assignment progress

Lecturer: Suleiman Halasah

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 538-571

Discussion: renewable energy regulations in Israel

Session 6 - (1.5 hours lecture and 1.5 hour midterm exam)

The water cycle- the liquid state of matter, properties of water, types of solutions; the pH concept.

Lecturer: ***Dr. Tareq Abu Hamed***

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 176-203

Session 7 - (3 hours lecture)

What is toxicity, Analysis of several natural and industrial processes, hazardous substances, whole life cycle analysis

Lecturer: ***Dr. Shmuel Brenner***

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 404-431

Discussion: Toxicity of VOC

Session 8 - (3 hours)

At the beginning of this session each student will present in 3 minutes his assignment progress

Understanding radiation –ionizing and non ionizing radiation, radioisotopes in the life cycle, radon, ALARA, EM radiation, the precautionary principle

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th)

Lecturer: Dr. Shmuel Brenner

Pearson-Prentice Hall (2005), pages 348-373

Session 9- (1.5 hour lecture and 1.5 hour hands on)

Wastewater and wastewater treatment

Lecturer: ***Dr. Tareq Abu Hamed***

Readings: “Environmental Science” by Richard T. Wright, International Edition (9th) Pearson-Prentice Hall (2005), pages 463-488

Hands on: 3 groups working on biogas, hydrogen production and the off grid village

Discussion: Comparison of waste water treatment in Israel and the PA

Session 10 - Field Trip (3 hours), with Assaf Admon to Nimra landfill (Lecturer: Suleiman Halasah)

Session 11 - (3 hours)

Air pollution – the gaseous state of matter, definitions, sources, effects, monitoring, standards

Lecturer: ***Dr. Tareq Abu Hamed***

Discussion: Air pollution from Power generation

*Readings: “Environmental Science” by Richard T. Wright, International Edition (9th)
Pearson-Prentice Hall (2005),pages 572-602
Environmental Pollution, Volume 130, Issue 1, July 2004, Pages 113-126*

Session 12 – (3 hours) Presentation of personal assignments; Conclusions

Lecturer: Suleiman Halasah

Session 13 - (3 hours) Review week

Lecturer: Dr. Tareq Abu Hamed

Final exam

Recommended Reading:

“Human Geography” by Paul L. Knox And Sallie A. Marston, 3rd Edition
Pearson-Prentice Hall (2004).

Will the Circle Be Unbroken: A History of the U.S. National Ambient Air Quality Standards.
John Bachmann, Journal of the Air & Waste Management Association, volume 57, pp 652-
697 (2007).

Sustainable Development, Global Environmental Change and Public Health. A.J .McMicheal
and T. Kjellstrom. Fall, Automne 2002.

Health and Sustainable Development World Summit on Sustainable Development.
International Institute for Environmental and Development. . David Bradley, Sandy
Cairncross and Carolyn Stephens. May 2001.