

# Introduction to Environmental Science

Dr. Shmuel Brenner & Dr. Tareq Abuhamed  
3 academic hours, 3 credits

## 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

### Grading

Class participation	10%
Presentation	20%
Paper	30%
Quiz	40%

## Textbook for the course:

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

## Lecture 1 :

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

Lecturer: Dr. Shmuel Brenner

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

## Lecture 2:

Chemical and physical tools assisting environmental studies – the atomic structure, chemical bonding and chemical reactions, energy and energy forms, the states of matter.

(At the beginning of week 3 each student will present in 3 minutes his personal assignment)

Lecturer: Dr. Tareq Abuhamed

*Readings:* "Environmental Science" by Richard T. Wright, International Edition (9<sup>th</sup>)  
Pearson-Prentice Hall (2005), pages 54-68, 320-347 and appendix B, pages 667-668

## Lecture 3:

The fuel cycle, electricity, the wave theory, units

(At the beginning of week 3 each student will present in 3 minutes his personal assignment)

Lecturer: Dr. Shmuel Brenner

*Readings:* "Environmental Science" by Richard T. Wright, International Edition (9<sup>th</sup>)  
(same as week 2)

**Lecture 4:**

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 (9<sup>th</sup>)  
Pearson-Prentice Hall (2005), pages 404-431

**Lecture 5:**

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

Lecturer: Dr. Tareq Abuhamed

*Readings:* "Environmental Science" by Richard T. Wright, International Edition (9<sup>th</sup>)  
Pearson-Prentice Hall (2005), pages 348-401

**Lecture 6:**

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

Lecturer: Dr. Shmuel Brenner

*Readings:* "Environmental Science" by Richard T. Wright, International Edition (9<sup>th</sup>)  
Pearson-Prentice Hall (2005), pages 572-602

**Lecture 7:**

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

Personal assignments where do we stand? (3 minutes for each student)

Lecturer: Dr. Tareq Abuhamed

*Readings:* "Environmental Science" by Richard T. Wright, International Edition (9<sup>th</sup>)  
Pearson-Prentice Hall (2005), pages 176-203, 462-488

**Lecture 8 :**

Lecturer: Dr. Shmuel Brenner

Regional field trip.

**Lecture 9:**

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

Lecturer: Dr. Tareq Abuhamed

*Readings:* "Environmental Science" by Richard T. Wright, International Edition (9<sup>th</sup>)  
Pearson-Prentice Hall (2005), pages 538-571 (and again 572-602)

**Lecture 10:**

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 (9<sup>th</sup>)  
Lecturer: Dr. Shmuel Brenner  
Pearson-Prentice Hall (2005), pages 348-373 (again),

**Lecture 11:**

Presentation of personal assignments; Conclusions  
Dr. Tareq Abuhamed

**Lecture 12 :**

Summary lesson  
Lecturer: Dr. Shmuel Brenner

**Recommended Reading:**

“Human Geography” by Paul L. Knox And Sallie A. Marston, 3<sup>rd</sup> 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, Autumn 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.