

ITT Technical Institute
SC4730
Environmental Science
Onsite and Online Course

SYLLABUS

Credit hours: 4.5


Contact/Instructional hours: 56 (34 Theory Hours, 22 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisites: EN1420 Composition II or equivalent, MA1210 College Mathematics I or equivalent

Course Description:

This course explores the issues of environmental science using an integrative approach against a political, geographic, cultural and economic backdrop. Through hands-on and virtual labs and applied problem sets, students will study the impact humans have on the environment and the costs and benefits of mitigating the impact. This course includes a laboratory component,



COURSE SUMMARY

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MAJOR INSTRUCTIONAL AREAS

1. Sustainability and environmental policy
2. Ecosystems and ecology
3. Atmospheric science
4. Water resources
5. Natural resources
6. Energy

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Explain the foundations of environmental science.
2. Analyze how political, geographic, economic, and cultural factors impact environmental issues.
3. Explain the importance of biodiversity for ecosystem health.
4. Evaluate the effects of chemical and biological contaminants on humans and the environment.
5. Evaluate the scientific basis of current environmental issues facing society.
6. Analyze the impacts of contemporary human activities on the earth.
7. Analyze the impact of climate change on the environment.

COURSE OUTLINE

MODULE 1: ENVIRONMENTAL SCIENCE AND ISSUES

COURSE LEARNING OBJECTIVES COVERED

- Explain the foundations of environmental science.
- Analyze how political, geographic, economic, and cultural factors impact environmental issues.

TOPICS COVERED

- Environmental Science
- Human Impacts on the Environment
- Human Values and Environmental Problems
- Environmental Justice

| MODULE LEARNING ACTIVITIES | GRADE D | OUT-OF- CLASS TIME |
|---|------------|--------------------------|
| Reading: Berg, L., Hassenzahl, D., & Hager, M., Chapters 1 and 2. | No | 3 hr |
| Lesson: Study the lesson for this module. | No | 2 hr |
| Discussion: Participate in the discussion titled “Environmental Issues.” | Yes | N/A |
| Analysis: Submit the analysis titled “Human Contribution to Environmental Issues.” | Yes | 3.5 hr |

Total Out-Of-Class Activities: 8.5 Hours

MODULE 2: FACTORS IMPACTING ENVIRONMENTAL ISSUES

COURSE LEARNING OBJECTIVES COVERED

- Analyze how political, geographic, economic, and cultural factors impact environmental issues.
- Evaluate the effects of chemical and biological contaminants on humans and the environment.
- Analyze the impacts of contemporary human activities on the earth.

TOPICS COVERED

- Environmental History
- Environmental Legislation
- Environmental Economics

| MODULE LEARNING ACTIVITIES | GRADE D | OUT-OF- CLASS TIME |
|---|------------|--------------------------|
| Reading: Berg, L., Hassenzahl, D., & Hager, M., Chapter 3. | No | 1.5 hr |
| Lesson: Study the lesson for this module. | No | 2 hr |
| Discussion: Participate in the discussion titled “Plastics Recycling.” | Yes | 1 hr |
| Analysis: Submit the analysis titled “Renewable Energy Policy Challenges.” | Yes | 3.5 hr |
| Research: Submit the research titled “Earth Day.” | Yes | 3.5 hr |
| Lab: Complete the lab titled “Controversies on Environmental Issues.” | Yes | 1 hr |

Total Out-Of-Class Activities: 12.5 Hours

MODULE 3: BIODIVERSITY AND THE ECOSYSTEM

COURSE LEARNING OBJECTIVES COVERED

- Explain the importance of biodiversity for ecosystem health.

TOPICS COVERED

- Ecology
- Flow of Energy Through Ecosystems
- Earth's Major Biomes
- Endangered and Extinct Species
- Conservation Biology

| MODULE LEARNING ACTIVITIES | GRADE D | OUT-OF- CLASS TIME |
|--|------------|--------------------------|
| Reading: Berg, L., Hassenzahl, D., & Hager, M., Chapters 5, 6, and 15. | No | 5.5 hr |
| Lesson: Study the lesson for this module. | No | 2 hr |
| Discussion: Participate in the discussion titled "Human Dependence on the Environment." | Yes | 1 hr |
| Analysis: Submit the analysis titled "Threat of Declining Biodiversity." | Yes | 3 hr |
| Research: Submit the research titled "Effectiveness of the Endangered Species Act (ESA)." | Yes | 3.5 hr |
| Lab: Complete the lab titled "Local Ecosystem." | Yes | 1.5 hr |

Total Out-Of-Class Activities: 16.5 Hours

MODULE 4: EFFECTS OF CONTAMINANTS ON THE ENVIRONMENT

COURSE LEARNING OBJECTIVES COVERED

- Evaluate the effects of chemical and biological contaminants on humans and the environment.

TOPICS COVERED

- Environmental Health Hazards
- Health Effects of Pollutants
- Air Pollution
- Solid and Hazardous Waste

| MODULE LEARNING ACTIVITIES | GRADE D | OUT-OF- CLASS TIME |
|--|------------|--------------------------|
| Reading: Berg, L., Hassenzahl, D., & Hager, M., Chapters 4, 8, 9, and 16. | No | 6 hr |
| Lesson: Study the lesson for this module. | No | 2 hr |
| Analysis: Submit the analysis titled “Endocrine Disrupters.” | Yes | 3.5 hr |
| Research: Submit the research titled “Sources and Impacts of Contaminants.” | Yes | 3.5 hr |
| Lab: Complete the lab titled “Vehicle Sources of Pollution.” | Yes | 3 hr |

Total Out-Of-Class Activities: 18 Hours

MODULE 5: EFFECTS OF HUMAN ACTIVITIES ON THE ENVIRONMENT

COURSE LEARNING OBJECTIVES COVERED

- Analyze how political, geographic, economic, and cultural factors impact environmental issues.
- Evaluate the effects of chemical and biological contaminants on humans and the environment.
- Analyze the impacts of contemporary human activities on the earth.

TOPICS COVERED

- Population Ecology
- Population and Urbanization
- Water Pollution

| MODULE LEARNING ACTIVITIES | GRADE D | OUT-OF- CLASS TIME |
|--|------------|--------------------------|
| Reading: Berg, L., Hassenzahl, D., & Hager, M., Chapters 7 and 10. | No | 3.5 hr |
| Lesson: Study the lesson for this module. | No | 2 hr |
| Discussion: Participate in the discussion titled “Effects of Pollution on Potable Water.” | Yes | N/A |
| Analysis: Submit the analysis titled “Effects of Population Growth.” | Yes | 3 hr |
| Research: Submit the research titled “Positive Impacts of Human Activities on the Environment.” | Yes | 3 hr |
| Lab: Complete the lab titled “Issues Related to Clean-Water Supply.” | Yes | 1 hr |
| Final Exam: Prepare for the final exam. | No | 5 hr |

Total Out-Of-Class Activities: 17.5 Hours

MODULE 6: ENERGY RESOURCES

COURSE LEARNING OBJECTIVES COVERED

- Explain the foundations of environmental science.
- Analyze how political, geographic, economic, and cultural factors impact environmental issues.
- Explain the importance of biodiversity for ecosystem health.
- Evaluate the effects of chemical and biological contaminants on humans and the environment.
- Evaluate the scientific basis of current environmental issues facing society.
- Analyze the impacts of contemporary human activities on the earth.
- Analyze the impact of climate change on the environment.

TOPICS COVERED

- Energy Consumption
- Coal and Nuclear Energy
- Oil and Natural Gas
- Energy Conservation and Efficiency

| MODULE LEARNING ACTIVITIES | GRADE D | OUT-OF- CLASS TIME |
|--|------------|--------------------------|
| Reading: Berg, L., Hassenzahl, D., & Hager, M., Chapters 17 and 18. | No | 3 hr |
| Lesson: Study the lesson for this module. | No | 2 hr |
| Analysis: Submit the analysis titled “Green Architecture.” | Yes | 3 hr |
| Lab: Complete the lab titled “Debate on Energy Issues.” | Yes | 1 hr |
| Final Exam: Take the final exam. | Yes | N/A |

Total Out-Of-Class Activities: 9 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

| CATEGORY | WEIGHT |
|------------|--------|
| Discussion | 10% |
| Research | 25% |
| Analysis | 25% |
| Lab | 30% |
| Final Exam | 10% |
| TOTAL | 100% |

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

| GRADE | PERCENTAGE |
|--------------|------------|
| A (4.0) | 90–100% |
| B+ (3.5) | 85–89% |
| B (3.0) | 80–84% |
| C+ (2.5) | 75–79% |
| C (2.0) | 70–74% |
| D+ (1.5) | 65–69% |
| D (1.0) | 60–64% |

| | |
|----------|------|
|) | |
| F (0.0) | <60% |

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Berg, L., Hassenzahl, D., & Hager, M. (2013). *Visualizing environmental science (4th ed.)*. Hoboken, NJ: Wiley.
- Wagner, T., & Sanford, R. (2010). *Environmental science: Active learning laboratories and applied problem sets (2nd ed.)*. Hoboken, NJ: Wiley.

RECOMMENDED RESOURCES

- ITT Tech Virtual Library (accessed via Student Portal | <https://studentportal.itt-tech.edu>)
 - Basic Search>
 - (2014). THE ENVIRONMENT Global warming is a global issue. *The Age (Melbourne, Australia)*.
 - Awtar Yadav, R. (2014). Media Lacking Aggression to Report Environment-Related Issues. *International Journal Of Multidisciplinary Approach & Studies, 1(4), 147-155*.
 - Fournier-Sylvester, N. (2013). Daring to Debate: Strategies for Teaching Controversial Issues in the Classroom. *College Quarterly, 16(3)*.
 - Krass, D., Nedorezov, T., & Ovchinnikov, A. (2013). Environmental Taxes and the Choice of Green Technology. *Production & Operations Management, 22(5), 1035-1055. doi:10.1111/poms.12023*
 - LEROY, P., & SURAUD, M. (2014). Environment and communication—the multiple transformations of environmental issues. *Essachess, 7(1), 5-9*.
 - Renewable Energy. (2014). *Monthly Energy Review, 135*.
 - WTREY, S. (2014). ENERGY SHAKE-UP. *Georgia Trend, 30(1), 96*.



INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as examples, case studies, and lessons that will require you to research contemporary environmental issues to understand the impact humans have on the environment. Your progress will be regularly assessed through a variety of assessment tools including discussion, research, analysis, lab, and a final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

| | |
|-----------------|--|
| Instructor Name | |
| Office Hours | |
| Contact Details | |

(End of Syllabus)