

RC210

Water Issues and Conservation Practices

3 Credits

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RC210 Version: 3



Water Issues and Conservation Practices

Calendar Description

The availability of good quality water is considered to be one of the biggest issues of the future. This course looks at global water sources, quality of water supplies and what needs to be done to conserve water. Potential water conservation practices for agriculture, industry and homeowners are reviewed.

Rationale

This is a required course for the Renewable Energy and Conservation program. Earth's water supplies are facing several challenges. The availability of water for human use is limited by the quantity and timing of supply, as well as by the quality of the water. When adequate water supply is not available, there are consequences to human health, food supply, and economic activity.

There are several water management strategies that can be used to attempt to meet global water needs. Engineering projects can often be used to regulate water supply, however, there are limitations and disadvantages to these projects, including serious environmental impacts. Increasing conservation efforts and reducing water demand in the domestic, agricultural, and industrial sectors could have a significant impact. Economic, legal, and political factors also influence water management decisions.

Good decisions on water management strategies for the future can only be made by understanding these physical, economic, legal and political constraints. This course discusses these water issues and conservation.

Prerequisites

Although not required, students are encouraged to take RC201 Energy and the Environment before RC210 Water Issues and Conservation.

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. provide an overview of Earth's water challenges.
2. describe the sources and stores of water available, and the quality requirements of water for human use.
3. describe the availability and uses of water on a global scale.
4. describe the causes of and responses to flooding, water scarcity and drought.
5. explain how changes in climate, population and land use can affect water supply.
6. describe the operation, benefits, and disadvantages of dams, canals, and other various water management technologies.
7. explain how human activities are affecting water quality.
8. describe domestic, agricultural and industrial water needs, and conservation or demand reduction opportunities.
9. describe how economic, legal and political issues can influence water management decisions.
10. summarize water management actions that might be used to meet the water demands of the future.

Resource Materials

Required Text(s):

These textbooks will be mailed out to registered students:

Anisfeld, S.C. 2010. Water resources. Island Press, Washington, D.C.

Black, M., and J. King. 2016. The atlas of water: mapping the world's most critical resource. 3rd ed. University of California Press, Berkeley and Los Angeles, California:.

Conduct of Course

This course consists of the equivalent of 45 hours of lecture delivered through the Internet using an on-line learning manager program. Course content modules and links to some assigned readings will be available on-line. A course facilitator will be available to guide the student through the course, answer any questions, and grade assignments. Students are expected to participate in on-line discussion forums with other classmates and the course facilitator. Assignments include on-line discussions and assessments (on-line quizzes). Assignments will be submitted through the learning manager program. Exams will be taken on-line. In order to complete the course on time, deadlines for assignments and exams will be enforced.

Evaluation Procedures

Grades are assigned with the following weightings:

| <u>Evaluation Tool</u> | <u>Weighting</u> |
|--|------------------|
| 20 Assignments/Assessments/Discussions worth 3% each | 60% |
| Midterm Exam | 20% |
| Final Exam | <u>20%</u> |
| Total | 100% |

Grade Equivalents and Course Pass Requirements

A minimum grade of D (50%) (1.00) is required to pass this course.

| Letter | F | D | D+ | C- | C | C+ | B- | B | B+ | A- | A | A+ |
|---------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Percent Range | 0-49 | 50-52 | 53-56 | 57-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-100 |
| Points | 0.00 | 1.00 | 1.30 | 1.70 | 2.00 | 2.30 | 2.70 | 3.00 | 3.30 | 3.70 | 4.00 | 4.00 |

Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.

Attendance

Active participation is required in all courses within the Renewable Energy and Conservation certificate and diploma programs. Each facilitator designates these requirements through the use of tools within the management system and personal contact with learners.

These expectations can be given marks as part of the assessment process. Each course outlines these expectations within the course structure.

Learners will be asked to demonstrate their participation/attendance through discussion forums, sharing research results, contributing relevant information, submitting assignments, communicating with colleagues and the facilitator, and participating in synchronous meetings or asynchronous activities.

Attendance is considered vital to the learning process. Students are expected to keep up with the set course schedule. If a student is unable to participate for an extended period of time, marks will not be given for material missed. With prior notice, the facilitator may allow extensions for missed assignments at his/her discretion.

NOTE: Any exceptions to the above attendance policy (e.g. family or work-related issues) **must** be approved in writing by the Department Chair **prior** to the beginning of the course.

Course Units/Topics

1. Water Supply and Demand
 - 1.1. Introduction
 - 1.2. Water Quantity
 - 1.3. Water Quality
 - 1.4. Water Supply and Demand
2. Water Issues
 - 2.1. Too Much Supply (Floods)
 - 2.2. Too Little Supply (Scarcity and Drought)
 - 2.3. Effects of Climate Change and Population
 - 2.4. Effects of Land Use Change
3. Managing Supply
 - 3.1. Dams
 - 3.2. Canals
 - 3.3. "Soft" Water Technologies
 - 3.4. Water Quality and the Environment
4. Managing Demand
 - 4.1. Domestic Use
 - 4.2. Agricultural Use
 - 4.3. Industrial Use
5. Economics, Law & Politics of Water Management
 - 5.1. Economic Considerations
 - 5.2. Legal and Political Considerations
 - 5.3. Conclusion: Future Water



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