Syllabus

ESE 320: Water Planet/Water Crisis

On this page:

Course Description

Examines water as a miraculous substance and a central player in Earth's environment, then explores society's needs for water and some technological approaches to addressing the growing water crisis.

Course Objectives

Upon completing this course, students will be able to:

- Understand the physical and chemical properties of water that make it such a unique and important substance.
- Explain the role of water in climate and weather in the earth system.
- Describe the general mechanisms of groundwater and surface water flow and their limitations as a resource.
- Identify the sources affecting water quality and their effect on the usable water supply.
- Explain why humans consume so much water and why there seems to be a water shortage in many areas around the globe.
- Predict how societal and climatic changes will affect water supply and water demand in the future.
- Identify possible solutions to the global water crisis and assess the pros and cons of each.

Course Structure

This is a **3–credit hour** course. The course is **8 weeks** long; it consists of 8 content modules. Please be aware that this course is accelerated in nature; 16 weeks' worth of content will be covered in an 8-week time span. You should dedicate approximately **12–16 hours** per week to working on the course itself, but actual time commitments will vary depending on your input, needs, and personal study habits. You are required to log on to the course website a minimum of **4 days per week** but as discussions develop, you will probably need to do so more frequently.

This course is designed with the principles of collaborative learning, constructivism, and active participation in mind. You are encouraged to share your thoughts and engage in problem-solving. The course has a consistent and predictable structure, organized around the modules, with a course website that is straightforward and easy to navigate. Instructions and due dates for activities and assignments are clearly articulated so that you know what is expected of you and will be able to easily stay on track.

We realize that you have a life beyond the scope of this course. However, if you are unable to complete an assignment because of professional obligations, you should notify the instructor or, better yet, prepare the assignment ahead of time and post it early. This will give your classmates a head start in reading and responding to your work. Most assignments are due by 11:55 PM of their respective due dates as listed on the Week Overview pages, giving you and your classmates time to read and comment on each other's work before the next module begins.

Assigned readings and responses to discussion questions should be read and submitted during the module for which they are assigned in order to get the most benefit from the discussions. At the end of each content module, participants will have an opportunity to make sure that they have completed all the required activities and assignments.

Textbooks

Required Textbooks

None.

Optional Textbooks

None.

Articles and e-Reserves

Other reading materials and e-reserves will be listed on the Week Overview pages within the course website.

Course Outline

The first four weeks of the course cover topics about the water planet.

Week 1: Why We Love Water

- Everyday Uses of Water
- Key Characteristics of Water
- Properties of Water: Why It's So Important To Us

Week 2: Water in the Earth System

- Water Vapor in the Atmosphere
- The Oceans: Role in Climate and Weather
- Ice Sheets, Ice Ages, and Ice Stability

Week 3: Groundwater and Surface Water

- Groundwater Recharge, Flow, and Occurrence
- Groundwater Supplies and Limitations
- Basic Theory: Watersheds, Rivers, and Lakes
- Infiltration, Runoff Generation, and River Discharge
- Gauging: Measurements in Surface Water Hydrology

Week 4: Water Quality

- Natural Water Quality
- Human-Caused Contamination
- Exam 1

The second four weeks of the course cover topics about the water crisis.

Week 5: Water Supply and Water Demand

- The Hydrologic Cycle and World Water Resources
- Human Consumption of Water
- Water Distribution

Week 6: Water in a Changing World

- Population Growth
- Lifestyle Changes
- Land Use and Land Coverage Changes
- Climate Change
- Pollution

Weeks 7 and 8: Solutions to the Water Crisis

- Hard Path Solutions
- Soft Path Solutions
- Exam 2

Course Activities

Grading Scale

Grade	Points	Percent

Grade	Points	Percent
A+	676–700	97–100
A	641–675	92–96
A–	627–640	90–91
B+	606–626	87–89
B	571–605	82–86
B–	557–570	80–81
C+	536–556	77–79
C	501–535	72–76
C–	487–500	70–71
D+	466–486	67–69
D	431–465	62–66
D–	417–430	60–61
F	0–416	0–59

View the Graduate College Handbook for Students, Faculty and Staff Chapter III: Academic Record Grading System page for more information.

Assignments, Weights, and Deliverables

You can access your scores by clicking the **Grades** link from the left column of the course homepage under **Settings**.

All interim and final deliverables have due dates. Failure to meet deadlines results in a reduction of the assignment points. For the due dates of each assignment, please see the Week Overview pages.

Point Distributions										
Assignments	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Total points per assignment**	**Relative weight**
Challenge and Initial Thoughts	10	10	10	10	10	10	10		70	10%
Homework	40	40	40	40	40	40	40		280	40%
Review and Reflection	10	10	10	10	10	10	10		70	10%
Exam					140			140	280	40%
Total points	60	60	60	60	200	60	60	140	700	

Point Distributions										
Assignments	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Total points per assignment**	**Relative weight**
for the week										

Week Overview

Each week will begin with the week overview, explaining what the module is about, what learning goals you are expected to achieve, how long the module will take, and in what activities you will participate. Each module is designed with the same structure and activities unless otherwise specified. The module activities are explained in greater detail below. You can find the due dates of specific assignments in the Week Overview pages.

Challenge and Initial Thoughts

The Challenge and Initial Thoughts section is designed to provide you with the opportunity to evaluate what you already know about the module topic before engaging with the resource materials included in the module. This is significant, because in learning we must integrate any new knowledge with our existing knowledge about a topic. That is, you will be successful in this learning activity to the extent that you consider the issues illustrated in the case scenarios within the context of the questions and then consider what you already know, and what you need to know, about these issues.

After being introduced to the case or questions, but before you delve into the readings and other resources in this module, you will write your initial thoughts, which will be shared with your peers in the class. By recording your initial thoughts, you will access what you know about the topics covered in the module. Doing so will help you integrate what you are about to learn with your pre-existing knowledge.

Lecture

Each week, Todd Cole will share with you his summary and explanation of the most important ideas you should take away from the week.

Readings

For each week, you'll have access to a variety of articles, book chapters, Web pages, and/or video clips that are designed to provide you depth of knowledge and a diversity of opinions on the topic at hand. Work to understand the argument or idea being presented. Think about how the ideas presented build on or contrast with your existing knowledge. Write down any questions you have about the item and how it relates to other information you've learned in the course. Taking notes as you read or watch these materials is a useful way to engage in active learning. These materials provide the information that you will use for the remaining activities in each module.

Homework

Each week will include a homework activity which will challenge you to apply what you have learned and to explore certain topics in greater detail.

Review and Reflect

At the end of each week, you will take time to reflect on what you have learned in the week. The focus of this reflection is a review of your initial thoughts and how your knowledge about the week's content has changed. In addition, you will write a paragraph describing one important lesson from this week.

Exams

This course will employ two non-cumulative exams. For on-campus students, you have the option of taking the exams on the U of I campus. For off-campus students, you have the option of using an online proctoring service (ProctorU - described below) or selecting an acceptable third party proctor (also described below). The times/dates/places of the various options for the taking the exams can be found on the 'Where will you take Exam 1?" and "Where will you take Exam 2?" pages. The links to these pages are located near the top of the main course webpage.

Exam Proctoring Options

Option 1: On-Campus: If you wish, you can take the exams at the Urbana-Champaign campus.

Option 2: ProctorU: ProctorU is an online proctoring service that allows students to take exams online while ensuring the integrity of the exam for the institution. The service authenticates your identity and monitors both your computer screen and webcam to ensure academic integrity:

- Fee based exam ($14.75 /1-hour exam, $21.50 /90-min. and 2-hour exam, $30.25 /3-hour exam) billed when you schedule the exam. Refunds are given only if the exam is canceled within 48 hours before the scheduled exam time.
- All appointments should be made at least 3 days in advance, since reservations made within 72 hours of your exam are subject to a $5 late reservation fee.
- Web cam, microphone, and computer with internet connection are required.
- ProctorU System Requirements and System Test
- How to Schedule Your Exam with ProctorU

Option 3: Proctored Location Off Campus (other than ProctorU): If you choose a proctored location off campus (other than ProctorU), it must allow for web-based testing. You must also complete the Third-Party Proctor Request Form and email it to your instructor no later than two weeks before the exam date to indicate your third-party proctored exam choice and your off-campus proctor information. You may consult the NCTA links below for possible testing center locations. Note that not all testing centers listed have web-based testing, so please be sure to choose a testing center that will allow you to take your tests online (for Illinois Compass/WebCT, see the java and browser requirements). Once you have chosen your

proctor, it is your responsibility to schedule the exam with the proctor. Your instructor will notify the proctor with instructions on how to access your exam. Please verify with the proctor that they will be open and able to proctor the exam for you before contacting your instructor about this proctored exam choice. NOTE: the final decision to approve a third-party proctor is up to the instructor.

- NCTA Consortium of College Testing Centers
- NCTA College Testing Centers in Illinois

Checklist

Each week will present a checklist at the end to help you verify with confidence that you have completed all of the required activities for that week.

A note about sources of information: It is highly recommended that you only consult the following sources of information in studying for this class. Use of another source (such as Internet sites found via Google) may provide information that is unreliable.

- Class textbooks and required readings
- Supplemental information posted on course Web site
- Internet links provided in class or on course Web site

Technical Support

If you need help:

- Only contact your instructor directly if you have a personal question.
- For all other questions about course content, activities, deadlines, technical problems, etc., please check the Course Q & A forum to see if someone else has already asked your same question and received a response.
- If your question isn't there yet, post your question to the Course Q & A forum. Feel free to help your peers out if you know the answer!
- If you have technical problems, please fill out this form.