

Term Information

Effective Term Autumn 2022
Previous Value Autumn 2021

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Updates to learning outcomes to fulfill new GE requirements; minor updates to topic list for clarity

What is the rationale for the proposed change(s)?

To align this course with the new GE. Topic list updates do not represent a change in content. Terms were changed to better connect with our students by using terminology that they use and are familiar with.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

n/a

Is approval of the request contingent upon the approval of other course or curricular program request? Yes

Please identify the pending request and explain its relationship to the proposed changes(s) for this course (e.g. cross listed courses, new or revised program)

A new course request for ENR 2101 will be submitted concurrently to make 2100 and 2101 3+1 courses for the new GE Foundations: Natural Science.

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area Environment & Natural Resource
Fiscal Unit/Academic Org Sch of Enviro&Natural Res - D1173
College/Academic Group Food, Agric & Environ Science
Level/Career Undergraduate
Course Number/Catalog 2100
Course Title Introduction to Environmental Science
Transcript Abbreviation Intro Envrnmntl Sc
Course Description Introduction to environmental science, the ecological foundation of environmental systems, the ecological impacts of environmental degradation by humans, and strategies for sustainable management of environment and natural resources.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week, 6 Week, 4 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? Yes
Is any section of the course offered 100% at a distance
Grading Basis Letter Grade
Repeatable No
Course Components Lecture
Grade Roster Component Lecture
Credit Available by Exam Yes

Exam Type	Advanced Placement Program, EM Tests via Office of Testing
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites	
Exclusions	
Electronically Enforced	No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	03.0101
Subsidy Level	General Studies Course
Intended Rank	Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
General Education course:
Biological Science; Natural Sciences

Previous Value

Required for this unit's degrees, majors, and/or minors
General Education course:
Biological Science

Course Details

Course goals or learning objectives/outcomes

- engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.
- explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.
- identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.
- discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.
- analyze the inter-dependence and potential impacts of scientific and technological developments.
- evaluate social and ethical implications of natural scientific discoveries.
- critically evaluate and responsibly use information from the natural sciences.

Previous Value

- *Understand the basic facts, principles, theories, and methods of modern science*
- *Acknowledge key events in the development of science and recognize that science is an evolving body of knowledge.*
- *Describe the inter-dependence of scientific and technological developments*
- *Recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.*

Content Topic List

- Introduction
- Scientific Process, Persistent Pollutants
- Energy, Ecosystems, and Population Ecology
- Human Populations
- Biomes & Biodiversity, Freshwater Resources & Food production
- Protecting Earth's Freshwater, Protecting Earth's Atmosphere
- Nonrenewable Energy, Fossil Fuels and Climate Change
- Renewable & Alternative Energy
- Community Ecology
- Sustainable Living

Previous Value

- *Introduction, Basic Math, Metric & Elements*
- *Scientific Process, Persistent Pollutants*
- *Energy & Ecosystems, Population Ecology*
- *Human Populations*
- *Earth's Climate & Major Biomes, Freshwater Resources*
- *Protecting Earth's Freshwater, Protecting Earth's Atmosphere*
- *Environmental Cost of Coal & Petroleum*
- *Renewable & Alternative Energy*

Sought Concurrence

No

Attachments

- ENR2100+ENR2101 GE Application.docx: GE submission form
(Other Supporting Documentation. Owner: Fries, Sara Nicholson)
- Lecture Syllabus ENR2100.docx: ENR 2100
(Syllabus. Owner: Fries, Sara Nicholson)

Comments

- This is an existing Natural Science GE Course. There is no change to the course other than adjusting the GE Learning Goals and Outcomes to those of the new Natural Science GE, and minor changes to the topic list to improve clarity. This course is grandfathered into the new GE; and combined with ENR 2101 that is submitted as a new course request, will be a 3 + 1 credit hour Natural Science GE. Both courses must be taken to satisfy the Natural Science GE requirement. *(by Osborne, Jeanne Marie on 06/24/2021 04:29 PM)*

COURSE CHANGE REQUEST
2100 - Status: PENDING

Last Updated: Osborne, Jeanne Marie
06/24/2021

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Fries, Sara Nicholson	06/08/2021 09:58 PM	Submitted for Approval
Revision Requested	Osborne, Jeanne Marie	06/09/2021 03:49 PM	Unit Approval
Submitted	Fries, Sara Nicholson	06/15/2021 03:15 PM	Submitted for Approval
Approved	Osborne, Jeanne Marie	06/24/2021 04:29 PM	Unit Approval
Approved	Osborne, Jeanne Marie	06/24/2021 04:29 PM	SubCollege Approval
Approved	Osborne, Jeanne Marie	06/24/2021 04:31 PM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal	06/24/2021 04:31 PM	ASCCAO Approval

SYLLABUS

ENR 2100

Introduction to Environmental Science Lecture
Au22

GE Foundations, Natural Science: 3 credits

All Semesters: In-Person Sections and Online Sections

COURSE OVERVIEW

ENR 2100 fulfills 3-credits of the General Education (GE) Category Foundations: Natural Science. It is intended to be taken with the 1-credit GE Foundations: Natural Science laboratory titled “Introduction to Environmental Science Laboratory” (ENR 2101). Together the ENR 2100 lecture (3 credits) and ENR 2101 laboratory (1 credit) fulfill 4-credits of the General Education (GE) Category: Foundations, Natural Science.

ENR 2100 will be offered all semesters as both:

1. In-person section that will be taught as a synchronous class that meets 2 to 3 times each week of the semester (2 – 80 min lectures or 3 – 55 min lectures) in a classroom on the campus of Ohio State.
2. Online section that will be taught as an asynchronous self-paced virtual class (100% online) using Carmen.

Students will be able to select the section (i.e., in-person or online) that works best for them. Course content, quizzes, assignments, homework, exams, lectures, expectations, grading will be identical for both the in-person and online sections.

ENR 2100 will utilize multiple online platforms supported by Ohio State. All content, including lectures, slides, demonstrations, presentations, notes, videos, readings will be delivered through Carmen (<https://carmen.osu.edu>) or Ohio State Libraries (<https://library.osu.edu/>). Students will have free access to all course content for the entire semester.

ENR 2100 is self-paced to give students the ability to access and satisfy requirements within a flexible time frame. Lectures are broken down into weekly modules and students are given 1 week (7 days) to complete each module. All assignments are open book. However, all course requirements must be completed independently by the enrolled student. All assignments, quizzes and exams must be completed using Carmen.

A free open-textbook, free readings (e.g., journal articles, newspaper articles) and free documentaries will be provided through Carmen, Ohio State PressBooks, Ohio State Libraries, YouTube, academic institutions, professional organizations, and governmental agencies.

Instructor

Instructor: Dr. Brian H. Lower, PhD

Teaching Associate: Ms. Ella M. Weaver, MENR

Course Email: ENR2100@osu.edu

Phone: 614-292-2265 (SENR front desk)

Office Hours: Times posted on Carmen, can meet in-person or by Zoom

Course Prerequisites

There are no required prerequisites for enrolling in ENR 2100. Upon enrolling in this introductory college-level course, students are expected to have basic knowledge of the natural sciences as commonly taught at the pre-University level. This course is a prerequisite to several higher-level ENR courses offered by the School of Environment and Natural Resources. Please [speak to your academic advisor](#) for more information.

Course description

Introduction to environmental science, the ecological foundation of environmental systems, the ecological impacts of environmental degradation by humans, and strategies for sustainable management of environment and natural resources.

ENR 2100 fulfills 3-credits of the General Education (GE) Category Foundations: Natural Science. Students will engage in theoretical and empirical study within the natural sciences. Students will gain an appreciation of modern principles, theories, methods and modes of inquiry used generally across the natural sciences. Students will discern the relationship between science and technology, while appreciating the implications of scientific discoveries and the potential impacts of science and technology to address problems of the contemporary world.

Expected learning outcomes

This course fulfills the General Education (GE) rationale for the Foundations, Natural Science category. ENR 2100 fulfills Specific Goals 1 and 2 Natural Science and Expected Learning Outcome 1.1, 1.2, 2.1, 2.2 and 2.3.

When this 3-credit ENR 2100 lecture is taken in combination with the 1-credit ENR 2101 laboratory, together these 4-credits (i.e., 1-credit laboratory + 3-credit lecture) fulfill ALL Goals (i.e., Goals 1 and 2)

and ALL Expected Learning Outcomes (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 2.3) for the Foundations, Natural Science GE category.

ENR 2100 FULFILLS

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, while gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.

Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

Expected Learning Outcome 2.1: Successful students are able to analyze the interdependence and potential impacts of scientific and technological developments.

Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries.

Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences.

HOW THIS COURSE WORKS

Mode of delivery: ENR 2100 will be offered all semesters as both in-person section and online section. Students will be able to select the section (i.e., in-person or online) that works best for them.

1. The in-person section will be taught as a synchronous class that meets 2 to 3 times each week of the semester (2 – 80 min lectures or 3 – 55 min lectures) in a classroom on the campus of Ohio State.
2. The online section is a 100% asynchronous online course. There are no required sessions when students must be logged in to Carmen at a scheduled time.

Pace of online activities: This course is divided into **weekly modules**. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame. Course

content, quizzes, assignments, homework, exams, lectures, expectations, grading will be identical for both the in-person and online sections.

Credit hours and work expectations: This is a **3-credit-hour course**. According to [Ohio State policy](#), students should expect to spend 9 hours per week of the average student's time required to earn the average grade of "C" in this lab. A student's 9-hour-workweek includes direct instruction, watching videos, taking notes, studying, readings, assignments, quizzes and exams.

Attendance and participation requirements: Attendance is based on your online activity and participation in Carmen. You are expected to log in to the course in Carmen every week. During most weeks you will probably log in many times. Students who are enrolled in the in-person section of ENR 2100 are expected to attend in-person lectures each week. If you have a situation that might cause you to miss an entire week of class, please email ENR2100@osu.edu to discuss adjusted timelines.

COURSE MATERIALS AND TECHNOLOGIES

Textbook

RECOMMENDED/OPTIONAL

Environmental Science for a Changing World, 1st Edition (2013) or 2nd Edition (2014) or 3rd edition (2018), by Houtman, Karr, and Interlandi, published by W.H. Freeman. Any edition is acceptable for class. We recommend renting or purchasing the textbook from any online textbook site if you feel that this will enhance your learning experience. Exam, assignment, and quiz questions are NOT directly based on material from the textbook.

Course technology

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help>, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

BASELINE TECHNICAL SKILLS FOR ONLINE COURSES

- Basic computer and web-browsing skills
- Basic skills with Microsoft Word, Excel and PowerPoint
- Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](#).

REQUIRED EQUIPMENT

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

REQUIRED SOFTWARE

- [Microsoft Office 365](#): All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found [at go.osu.edu/office365help](http://go.osu.edu/office365help).

CARMEN ACCESS

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

GRADING AND FACULTY RESPONSE

How your grade is calculated

ASSIGNMENT CATEGORY	POINTS
5 Writing Assignments (each worth 5%)	25%
5 Quizzes (each worth 5%)	25%
1 Midterm Exam	25%
1 Final Exam	25%
Total	100%

**See course schedule for due dates. Everything due by 11:59PM on Sundays.*

A. Writing Assignments (5 assignments per semester, 5% each, 25% total): Students will complete a total of 5 writing assignments each semester, all of which will be submitted on Carmen. Each assignment will be unique and worth 5% of a student's Final Grade in ENR 2100. Assignments will be open on Carmen for 14 days to accommodate all students. Readings, data sets, documentaries that are required for writing assignments will all be free and provided through Carmen or links to these materials will be provided on Carmen. These assignments are open-book, however, a student must complete the work on their own without help from peers.

ENR 2100 - Objectives of writing assignments:

1. Locate primary source journal article using Web of Science, PubMed or another search engine.
2. Understand how journal articles are organized (e.g., abstract, introduction, results) and how to read an article, find information, interpret data and become proficient at reading and understanding figures, graphs and tables.
3. To make informed decisions and develop potential solutions to environmental issues based on published scientific articles, results and data.
4. Develop skills and gain experience in scientific writing and how to effectively present data using figures and tables.
5. Gain an appreciation for how discoveries in natural science often requires collaboration between many scientists from many different specializations.

ENR 2100 - For each writing assignment, students will be required to:

1. Answer short-answer and essay-style questions. These questions will be based on readings, documentaries or data provided by academic or governmental institutions. Some questions will require students to use formulas and equations, complete calculations, calculate statistical values, plot data, produce tables, and describe procedures and experimental approaches.
2. Use reasoning skills to propose method, protocol or technique that could be utilized to solve an environmental problem.
3. Evaluate the economic, social and ethical implications of scientific discoveries and new technologies.

B. Quizzes (5 quizzes per semester, 5% each, 25% total): Students will complete a total of 5 quizzes each semester, all of which will be completed using Carmen. Quizzes will be open for 7 days to accommodate all students. Each quiz will contain 10-20 questions that focuses on 1-2 weekly course modules. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Each quiz will be unique and worth 5% of the Final Grade for ENR 2100. These quizzes are open-book, however, students must

complete the work on their own without help from peers. Quizzes will focus on readings and course materials.

ENR 2100 - Objectives of quizzes:

1. Understand how data is collected by scientists, why replication is important in experiments. Analyze the process of scientific inquiry, principles, theories and methods of natural science.
2. Critically evaluate and responsibly use information from the natural sciences. Analyze data using statistics.
3. Learn how our knowledge and understanding about a scientific discipline has changed over time through the generation of testable explanations and predictions, newfound knowledge, new techniques and new instrumentation.
4. Recognize social and ethical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

ENR 2100 - For each quiz, students will be required to:

1. Read articles, book chapters and/or technical reports provided by instructor on Carmen or Ohio State Libraries. Watch short documentaries or instructional videos. There will be no cost to the student, all readings and videos will be free.
2. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on the articles and book chapters that students read, documentaries and instructional videos that students watch and data that students collect and analyze.

C. Exams (2 exams per semester, 25% each, 50% total): Students will complete a total of 2 exams each semester. Each exam will consist of 50 questions that focus on 7 weekly course modules preceding that exam. Exams will be completed using Carmen and open for 7 days to accommodate all students. Each exam will be unique and worth 25% of a student's Final Grade for ENR 2100. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Exams will focus on readings, lecture slides and lecture presentations. Exams are open-book, however, students must complete the work on their own without help from peers.

ENR 2100 - Objectives of exams:

1. Evaluate student learning at the end of weekly course modules.
2. Assess reading comprehension, problem solving skills, critical thinking and vocabulary usage.
3. Assess understanding of key concepts principles, theories, and methods.

ENR 2100 - For each exam, students will be required to:

1. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on lecture slides and lecture presentations given by the instructor.
2. Analyze and interpret data presented in figures, graphs and tables.
3. Use reasoning skills to solve problems using mathematics and statistics.
4. Make quantitative comparisons of data presented in graphs and tables

Late policy

Writing Assignments and Quizzes:

Assignments and quizzes will be submitted or completed through Carmen within a flexible time frame of 1 week for quizzes and 2 weeks for writing assignments. These can be completed at any time within the 1-week (quiz) or 2-week (writing assignments) submission window. Students will be permitted to work 1-week ahead if they choose to do so. Submission after the due date for assignments will result in a **10% deduction per calendar day from the overall grade. The submission window will automatically close after 10 days from the due date and will not reopen.** Submissions that are sent by email will not be accepted. All assignments must be submitted on Carmen. All quizzes must be taken on Carmen. Students will be given 2 attempts to take a quiz during these 7 days. We will keep the highest grade between both attempts.

Exams:

Exams will be taken on Carmen within a flexible time frame of approximately 7 days. Exams can be taken at any time within these 7 days. Students will be given 2 attempts to take an exam during these 7 days. We will keep the highest grade between both attempts. **Late submissions will not be accepted and will result in a grade of 0%. Missed exams will result in a grade of 0%.** All exams must be taken on Carmen. We will not accept exams that are sent by email.

Extenuating circumstances sometimes occur. Students who miss an assessment due to a legitimate reason (e.g., emergency, hospital visit, extended illness) should contact their instructor at ENR2100@osu.edu to request permission to make-up an assignment. The instructor will determine if an excuse is acceptable. If approved, the student will not be penalized -10% per day. If approved, the student must make up the missed assessment within a time frame specified by the instructor. Since this course has flexible due dates with assignments open for a period of days to weeks on [Carmen](#), acceptable excuses typically entail lengthy illness, extended hospitalization or other serious issues with official documentation.

The due date for each assignment is provided on Carmen on the very first day of the semester to help students plan their semester. It is the responsibility of the student to know the due date for all assignments. We do this to accommodate students busy schedules. Students are expected to plan their semester accordingly. Technical glitches such as a bad internet connection, faulty internet

browser, a computer that “crashes”, a battery that runs out of power, an obnoxious roommate, software malfunction, a flat tire, etc. are not acceptable excuses for missing a deadline. The instructor does not accept assignments by e-mail, and these will be deleted and not graded. Assignments should always be completed and/or submitted using [Carmen](#).

Grading scale

Letter Grade	%	Mastery
A	93.00–100.0	Demonstrates complete mastery of all learning outcomes as demonstrated on assessments; participates in all aspects of the lab in a positive and timely manner.
A-	90.00–92.99	
B+	87.00–89.99	Demonstrates mastery of at least two learning outcomes as demonstrated on assessments; participates in all aspects of the lab in a positive and timely manner.
B	83.00–86.99	
B-	80.00–82.99	
C+	77.00–79.99	Demonstrates mastery of at least one learning outcome as demonstrated on assessments; participates in some aspects of the lab in a positive and timely manner. A minimum grade of “C-“ will be earned by a student making a good faith effort on all aspects of the lab and demonstrated engagement.
C	73.00–76.99	
C-	70.00–72.99	
D+	67.00–69.99	Fails to meet mastery of any learning outcome such that student will not be successful in higher-level course; did not complete assessments; demonstrated lack of engagement, did not participate in lab, did not complete assessment in a timely fashion.
D	60.00–66.99	
E	00.00–59.99	

Instructor feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** Instructors check and reply to emails daily. Please email ENR2100@osu.edu as this is the email dedicated to the course. Please use your OSU email account to send emails to this account. We will reply to emails within **24 hours on days when class is in session at the university**.

- **Class announcements:** All important class-wide messages will be sent through the Announcements tool in CarmenCanvas. Please check [your notification preferences](http://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.
- **Grading and feedback:** Multiple-choice quizzes and exams will be graded immediately, and students will know their grade immediately after they submit a quiz or exam. For written assignments, these will be graded by hand, and you can expect a grade and feedback within **7-10 days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics. Beware not all students perceive color in the same way. When you use **color** also use **Bold**, *Italicize* or Underline as emphasis. A good practice is to use the Accessibility Checker in all Microsoft Office 365 products available to all students.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

EMAIL ETIQUETTE

Professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail.

DO

- Include a descriptive statement in the subject line.

- Use proper salutations when beginning an e-mail. For example: Dear/Hello Prof Buckeye,
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name. For example: Sincerely/Thank you, Brutus Buckeye.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item, make an appointment to do so during office hours.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness. I will typically post an Announcement when large grades are released.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review later when emotions are not directing the content.

Fair assessment practices

We understand that grades are important to our students and we strive to have clearly stated learning outcomes. We work hard to ensure that student grades are calculated in a fair and accurate manner. Things that we do to ensure that the assessments we administer are fair and accurate:

1. We use grading rubrics to score all writing assignments. These rubrics provide clear grading expectations for varying levels of mastery. Students are able to see a grading rubric before they start working on an assignment so that performance expectations are clearly understood.
2. We evaluate the outcomes of assignments by checking all questions and all answers after an assignment closes to check for mistakes. Typically, we want to see that each question was answered correctly approximately 80% of the time. This 80% threshold indicates that a question was a fair assessment of the course material. If this threshold is not met, we do not count the question or we provide students with another opportunity to answer a new question.
3. We use different kinds of assessments and each assessment type is weighted equally. We use written assignments, quizzes and exams to calculate a student's grade, and each is worth the same value for a student's Final Grade for the course. This has the impact of increasing a student's course grade by not weighing one assignment more than another.

4. We encourage students to do well on assessments by making all assignments, quizzes and exams open-book and allowing students to complete all assignments from anywhere.
5. We encourage students to do well on assessments by providing students an extended period of time (i.e., 7 days for quizzes and exams, 14 days for writing assignments) to complete assignments.
6. We accept late assignments with a small penalty of -10% deduction per day late. This ensures that a student would not receive an automatic grade of 0% for missing an assignment.
7. We provide clearly stated learning outcomes for our modules that are aligned to course content and assessments so that students better understand why they are completing an activity.

If you have questions about these practices or how your grade is calculated throughout the semester, please contact your instructor at ENR2100@osu.edu.

OTHER COURSE POLICIES

Academic integrity policy

POLICIES FOR THIS ONLINE COURSE

- **Quizzes and exams:** All quizzes and exams are open book. You can use notes, lecture slides, videos, documentaries, the Internet, Google, calculators, books, articles. You will not be required to use a remote proctoring service. However, you must complete the midterm and final exams yourself, without any external help or communication. You cannot use a group message app during the exam. You cannot share questions and answers. Students who violate these rules will receive a 0% and be reported to the Committee of Academic Misconduct.
- **Written assignments:** All writing assignments are open book. You can use notes, lecture slides, videos, documentaries, the Internet, Google, calculators, books, articles. Your written assignments should be your own original work. You can ask a trusted person to proofread your assignments before you turn them in, but this person should not revise or rewrite your work. Dr. Lower uses Turn-It-In software to check for plagiarism in all written assignments. Students will not receive credit for plagiarized work.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation me at ENR2100@osu.edu.

OHIO STATE'S ACADEMIC INTEGRITY POLICY

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the

University's [Code of Student Conduct](#), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Grievances

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department. Contacts for The School of Environment and Natural Resources can be found here: <https://senr.osu.edu/our-people>

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course. Under [The Ohio State University's Intellectual Property Policy](#), faculty retain copyright in

their creative and scholarly works. Students also hold the copyright in their own creative and scholarly works. The requirement to provide a copy of a paper or project created as an assignment for class does not mean that the student has surrendered their copyright.

For more information see: <https://library.osu.edu/copyright/basics>

Academic support services

The Ohio State University offers a variety of free services to aid students in their academic success. Below I have listed several that may be of use in this course. Additional academic support may be available through individual academic departments. Please [consult your academic advisor](#) or your program's website for more information.

- [Walter E. Dennis Learning Center](#) - provides academic workshops and courses designed to help students be more successful in their academics. Learning Specialists are available to meet with students individually to discuss topics like time management, study skills, test anxiety, etc.
- [Younkin Success Center](#) - houses a variety of services and resources for students including a computer lab and 24-hour study space during finals week. Also offered are tutoring, academic services, career services, and wellness services.
- [Center for the Study and Teaching of Writing](#) - assists students in writing research papers, lab reports, resumes, etc.
- [University Libraries](#) - provides over 20 libraries on campus, online resources, nationwide databases, etc.

Your mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://suicidepreventionlifeline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

- Online reporting form at equity.osu.edu,
- Call 614-247-5838 or TTY 614-688-8605,
- Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member."

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environment Sciences. These principles are located on the Carmen site for this course, and can also be found at <https://go.osu.edu/principlesofcommunity>. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu/>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://studentlife.osu.edu/bias/report-a-bias-incident.aspx>.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

DISABILITY SERVICES CONTACT INFORMATION

- Phone: [614-292-3307](tel:614-292-3307)
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of course technology

This course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](http://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](http://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)
- [Microsoft 365 accessibility](#)
- [Turnitin accessibility](#)

ACCESSIBILITY PRACTICES IN THIS COURSE

Several accessibility accommodations are already built into our course for all students (see list below). We work to provide these accommodations to all students and want to make sure all students have a positive learning experience in our course. Please send documentation from SLDS to ENR2100@osu.edu in order to establish any further accommodations needed during the semester.

1. **Extended Time (1.5x or 2x) Assignments: SLDS-REGISTERED STUDENTS SHOULD EMAIL THEIR PLAN.** A student must send their completed SLDS paperwork to the instructor at ENR2100@osu.edu. Once accommodations are verified, we will setup all assessments accordingly.
2. **Note Taking Assistance/Recording: PROVIDED TO ALL STUDENTS.** We provide all lab presentation slides via Carmen. Fully typed transcripts for lab presentations are provided via YouTube. Students can copy/paste the entire typed transcript anytime using any word processing software (e.g., Microsoft Word) directly from YouTube for all videos. These transcripts serve as written notes for all lectures.
3. **Distraction Reduced Testing Space, Small Group Setting: PROVIDED TO ALL STUDENTS.** Students can take all assessments on Carmen from anywhere. Students who are registered with Office of Student Life Disability Services (SLDS) and require distraction reduced testing space should make their own accommodations.
4. **Closed-captioning and transcripts: PROVIDED TO ALL STUDENTS.** All required multimedia (e.g., videos, podcasts) are accompanied with closed captioning or transcripts that meet ADA requirements. Most times these features are provided by the content producer (e.g., The New York Times, PBS, NPR, Nature, National Geographic). However, you may find select transcripts produced by the course team and linked in Carmen.
5. **Flexible due dates for assignments: PROVIDED TO ALL STUDENTS.** All quizzes and exams are open on Carmen for a period of 7 days and all writing assignments are open on Carmen for a period of 14 days to accommodate students' busy schedules. Students can complete these assignments anytime while the window is open. Extenuating circumstances sometimes occur. Students who miss a due date for a legitimate reason (e.g., emergency, hospital visit, extended illness, unforeseen health issue, homelessness) should contact the instructor before the due date by email (ENR2100@osu.edu) to request additional time. The instructor will determine if an excuse is acceptable.

COURSE SCHEDULE

Refer to the CarmenCanvas course for up-to-date due dates.

Week	Topic	Assessment	Due Date
1	Introduction	Quiz 1	Sunday at 11:59PM
2	Scientific Process		Sunday at 11:59PM
3	Persistent Pollutants	Writing Assignment 1	Sunday at 11:59PM
4	Human Populations	Quiz 2	Sunday at 11:59PM
5	Energy, Ecosystems and Population Ecology		
6	Community Ecology	Writing Assignment 2	Sunday at 11:59PM
7	Wrap Up and Prepare for Exam	Midterm Exam	Sunday at 11:59PM
8	Biomes and Biodiversity	Quiz 3	Sunday at 11:59PM
9	Water Resources and Food Production		Sunday at 11:59PM
10	Protecting Earth's Water	Writing Assignment 4	Sunday at 11:59PM
11	Protecting Earth's Atmosphere	Quiz 4	Sunday at 11:59PM
12	Nonrenewable Energy, Fossil Fuels and Climate Change		
13	Alternative and Renewable Energy	Writing Assignment 5	Sunday at 11:59PM
14	Sustainable Living		
15	Wrap Up and Prepare for Exam	Final Exam	Set by University

Application for GE Foundations, Natural Science: 4 credits

1. ENR 2100 - Introduction to Environmental Science Lecture (3 credits)
2. ENR 2101 - Introduction to Environmental Science Laboratory (1 credit)

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Natural Science.

ENR 2100 and ENR 2101 are taught by the School of Environment and Natural Resources (SENR). When taken together (ENR 2100 + ENR 2101) will fulfill 4 credits of the GE Foundations, Natural Science category. Introduction to Environmental Science Lecture (ENR 2100) is a 3-credit course that is currently taught at Ohio State as a Natural Science, Biological Science GE course. Introduction to Environmental Science Lab (ENR 2101) is a brand new 1-credit online laboratory. Both ENR2100 and ENR2101 follow a similar sequence in topics that introduce a wide breadth of study within this highly interdisciplinary field.

ENR 2100 will fulfill Natural Science Goals 1 and 2, and Expected Learning Outcomes (ELOs) 1.1, 1.2, 2.1, 2.2, and 2.3. ENR 2101 will fulfill Natural Science Goal 1 and ELO 1.3. When the 1-credit ENR 2101 laboratory is taken in combination with the 3-credit ENR 2100 lecture, together these 4-credits (i.e., 1-credit lab + 3-credit lecture) fulfills all Goals (i.e., Goals 1 and 2) and all ELOs (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 2.3) for the Foundations, Natural Science GE category.

SENR will offer ENR 2100 and ENR 2101 separately as a 3-credit lecture and 1-credit laboratory, rather than combining them together as a 4-credit course. We want to do this because (1) it will allow for greater flexibility for students when scheduling courses, (2) ENR 2101 will be offered exclusively online, while ENR 2100 will be offered as both an in-person synchronous course and an online asynchronous course each semester so that students can choose to take ENR 2100 in-person or online and (3) to accommodate SENR majors who will be required to take ENR 2100 but will not be required to take ENR 2101. Requiring SENR majors to take 4-credits (instead of 3-credits) would put them over the credit limit for earning a B.S. degree and make it difficult for them to finish their B.S. degree in 4 years. In addition, students earning a B.S. degree in SENR are already required and will continue to be required to take natural science labs in biology, chemistry, physics and soil science.

ENR 2100 and ENR 2101 will foster an understanding of the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world. Students will develop a foundational knowledge and understanding of natural sciences to evaluate the economic, social and ethical implications of scientific discoveries and new found technologies. Students will learn that environmental science is an interdisciplinary field of study,

which combines practices, theories and methods from the biological sciences, physical sciences and social sciences. Students will develop an understanding for the complex nature of Earth systems, how humans are part of and rely on these natural systems, how human activities contribute to environmental problems, and how changes in human activities, behaviors, beliefs and values can solve environmental problems. Developing scientific literacy skills to encourage life-long learning, will be emphasized throughout the course with high-impact readings, documentaries and the opportunity for students to practice and apply these skills through writing assignments and the creation and presentation of a scientific poster on contemporary topics in environmental science.

ENR 2100 and ENR 2101 will focus on similar topics and follow similar course designs. Course topics will be divided into 13 learning modules (see list below). One module will be taught approximately each week of the semester. Course materials for ENR 2100 and ENR 2101 will be completely free to all students and consist of lecture slides, lecture presentations, lecture transcripts, closed-caption lecture videos, study guides, self-check quizzes, vocabulary lists, journal articles, book chapters, documentaries, software, technical reports, grading rubrics, and data sets. Course materials will be provided to students through Carmen, the Ohio State Libraries, academic, professional or government websites and online open-source textbooks. Course materials have gone through extensive testing and usage to ensure that they meet accessibility guidelines required by the Ohio State Digital Accessibility Policy. Students who receive accommodations through Student Life Disability Services will receive all required accommodations.

Course Modules for ENR 2100 and ENR 2101:

1. Scientific Process and Experimental Design
2. Natural Science Literacy
3. Persistent Pollutants
4. Human Populations
5. Energy, Ecosystems and Population Ecology
6. Community Ecology
7. Biomes and Biodiversity
8. Water Resources and Food Production
9. Protecting Earth's Water
10. Protecting Earth's Atmosphere
11. Nonrenewable Energy, Fossil Fuels and Climate Change
12. Alternative and Renewable Energy
13. Sustainable Living

B. Specific Goals for Natural Sciences

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

GOAL 1 will be fulfilled in ENR 2100 (Lecture) and ENR 2101 (Laboratory)

Course Modules for ENR 2100 and ENR 2101:

1. Scientific Process and Experimental Design
2. Natural Science Literacy
3. Persistent Pollutants
4. Human Populations
5. Energy, Ecosystems and Population Ecology
6. Community Ecology
7. Biomes and Biodiversity
8. Water Resources and Food Production
9. Protecting Earth's Water
10. Protecting Earth's Atmosphere
11. Nonrenewable Energy, Fossil Fuels and Climate Change
12. Alternative and Renewable Energy
13. Sustainable Living

Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 1.1 will be fulfilled in ENR 2100 (Lecture)

ENR 2100 - Exams (2 exams per semester, 25% each, 50% total): Students will complete a total of 2 exams each semester. Each exam will consist of 50 questions that focus on 7 weekly course modules. Exams will be completed using Carmen and open for 7 days to accommodate all students. Each exam will be unique and worth 25% of a student's Final Grade for ENR 2100. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Exams will focus on readings, lecture slides and lecture presentations. Exams are open-book, however, students must complete the work on their own without help from peers.

ENR 2100 - Objectives of exams:

1. Evaluate student learning at the end of weekly course modules.
2. Assess reading comprehension, problem solving skills, critical thinking and vocabulary usage.
3. Assess understanding of key concepts principles, theories, and methods.

ENR 2100 - For each exam, students will be required to:

1. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on lecture slides and presentations given by the instructor.
2. Analyze and interpret data presented in figures, graphs and tables.
3. Use reasoning skills to solve problems using mathematics and statistics.
4. Make quantitative comparisons of data presented in graphs and tables.

Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 1.2 will be fulfilled in ENR 2100 (Lecture)

ENR 2100 - Quizzes (5 quizzes per semester, 5% each, 25% total): Students will complete a total of 5 quizzes each semester, all of which will be completed using Carmen. Quizzes will be open for 7 days to accommodate all students. Each quiz will contain 10-20 questions that focuses on 1-2 weekly course modules. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Each quiz will be unique and worth 5% of a student's Final Grade for ENR 2100. These quizzes are open-book, however, students must complete the work on their own without help from peers. Quizzes will focus on readings and course materials.

ENR 2100 - Objectives of quizzes:

1. Understand how data is collected by scientists, why replication is important in experiments. Analyze the process of scientific inquiry, principles, theories and methods of natural science.
2. Critically evaluate and responsibly use information from the natural sciences. Analyze data using statistics.
3. Learn how our knowledge and understanding about a scientific discipline has changed over time through the generation of testable explanations and predictions, newfound knowledge, new techniques and new instrumentation.
4. Recognize social and ethical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

ENR 2100 - For each quiz, students will be required to:

1. Read articles, book chapters and/or technical reports provided by instructor on Carmen or Ohio State Libraries. Watch short documentaries or instructional videos. There will be no cost to the student, all readings and videos will be free.
2. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on the articles and book chapters students read, documentaries and instructional videos students watch and data that students collect and analyze.

Expected Learning Outcome 1.3: Successful students are able to employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data.

Please explain the 1-credit hour equivalent experiential component included in the course: e.g., traditional lab, course-based research experiences, directed observations, or simulations. Please note that students are expected to analyze data and report on outcomes as part of this experiential component. (50-1000 words)

ELO 1.3 will be fulfilled in ENR 2101 (Laboratory)

ENR 2101 - Weekly Participation Activities (15 activities per semester, 1% each, 15% total): Each student will complete a total of 15 weekly participation assignments this semester (1 activity per week), all of which will be submitted on Carmen. Each activity will be open for 7 days to accommodate all students. Each activity will be unique and worth 1% of the student's Final Grade for ENR 2101. These assignments are open-book, however, a student must complete the work on their own without help from peers. A student who demonstrates good faith effort on all aspects of the weekly participation activity and demonstrated engagement in the activity will receive full credit.

ENR 2101 - Objectives of weekly participation activities:

1. To introduce students to each week's lab through readings, instructions or activities.
2. To serve as a formal weekly check-in that promotes and encourages two-way communication between student and instructor.
3. To graph data or organize data in a table. How to calculate mean, standard deviation, range. To compare data between different scientific studies.

ENR 2101 - For each weekly participation activity, students will be required to:

1. Complete a small 15–20-minute task (e.g., graph data, identify unknown samples, construct a scientific table, analyze and/or interpret data) that will be paired with topics contained in weekly modules.

Written Laboratory Assignments (10 assignments per semester, 5.5% each, 55% total):

You will complete a total of 10 laboratory assignments over 5 labs this semester, all of which will be submitted on Carmen and due on Sundays at 11:59PM. Each lab will be conducted over two weeks and comprise of two related laboratory assignments. For example, Lab Assignment 1 and Lab Assignment 2 will both pertain to the first lab on Experimental Design (see course schedule within syllabus). Within the first lab assignment, you will collect and report data. Within the second lab assignment you will summarize and analyze class data collected in the first lab assignment. Each assignment will be unique and worth 5.5% of your Final Grade for the course. Therefore, each lab will be worth 11% of your Final Grade (5.5% x 2 assignments = 11%) These assignments are open-book. Assignments will be available on Carmen for 7 days to

accommodate all students. Readings, data sets, and instructional videos that are required for laboratory assignments will all be free and provided through Carmen.

Objectives of written laboratory assignments:

1. Describe common instruments, equipment, techniques and methods used by scientists to collect data. Learn about protocols, operation, benefits and limitations of each.
2. Use described methods to collect data and report data to peer group.
3. Analyze consolidated peer group data through calculations (i.e., mean, p-value, standard deviation).
4. Summarize consolidated peer group data through visualizations (i.e., graphs, charts, tables).

Each written laboratory assignment will consist of two parts and you will be required to:

1. Part 1 - Learn about the lab procedure and how scientists have used the technique or methods in the peer-reviewed literature. Execute the experiment and report standardized data to your peer group on Carmen. Create, analyze and interpret graphs and tables using Microsoft Word and Microsoft Excel.
2. Part 2 - Answer short-answer and essay-style questions. These questions will be based on the data that you collect and analyze, and experiments that you conduct on your own at home. Some questions will require you to complete calculations, plot data, produce tables, and describe procedures and experimental approaches.

ENR 2101 - Scientific Poster Assignments (5 assignments per semester, 6% each, 30% total): Students will complete a total of 5 scientific poster assignments this semester, all of which will be submitted on Carmen. Each assignment will be unique and worth 6% of a student's Final Grade for ENR 2101. These assignments are open-book, however, students must complete the work on their own without help from peers. An open textbook titled "Scientific Posters, A Learners Guide" will serve as a reference as students complete poster assignments: <https://ohiostate.pressbooks.pub/scientificposterguide/>. This textbook is free to all students.

ENR 2101 - Objectives of scientific poster assignments:

1. Locate primary source journal article using Web of Science, PubMed or another search engine.
2. Understand how journal articles are organized (e.g., abstract, introduction, results) and how to read an article, find information, interpret data and become proficient at reading and understanding figures, graphs and tables.
3. Become familiar with scientific writing and how to effectively communicate results, information, data, and technical material in a scholarly work (e.g., poster, journal article, technical report).
4. Conduct peer review and understand its importance to the scientific process.
5. Create scientific figure and tables. Write a caption for each figure and table.

ENR 2101 - Five scientific poster assignments that students will complete each semester:

1. Poster Assignment 1: Find, download and read 6 primary source journal articles using Ohio State University Libraries' free online resources (<https://library.osu.edu/>). These articles should all focus on the same topic and/or issue of a student's choice. Find, read or watch 4 secondary sources on this same topic and/or issue. Write a concise 200–300-word summary of the information found in sources.
2. Poster Assignment 2: Write a title, abstract and introduction section for scientific poster.
3. Poster Assignment 3: Use Microsoft PowerPoint and Excel to create a total of 4 figures and/or tables for poster. Figures can be charts, diagrams, graphs, illustrations, images, maps, photographs. Using data from journal articles, students will create at least 1 original graph and 1 original table for their poster.
4. Poster Assignment 4: Create a scientific poster using PowerPoint from a template that is provided by instructor. This poster will contain a title, author information, introduction, materials and methods, results, discussion, references, figures and tables.
5. Poster Assignment 5: Students will record a 5-minute poster presentation and upload the audio file and a PDF file of their poster to the Virtual Poster Event on Carmen. Students will conduct peer reviews for 2 of their classmates' poster presentations.

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

GOAL 2 will be fulfilled in ENR 2100 (Lecture)

Course Modules for ENR 2100 and ENR 2101:

1. Scientific Process and Experimental Design
2. Natural Science Literacy
3. Persistent Pollutants
4. Human Populations
5. Energy, Ecosystems and Population Ecology
6. Community Ecology
7. Biomes and Biodiversity
8. Water Resources and Food Production
9. Protecting Earth's Water
10. Protecting Earth's Atmosphere
11. Nonrenewable Energy, Fossil Fuels and Climate Change
12. Alternative and Renewable Energy
13. Sustainable Living

Expected Learning Outcome 2.1: Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 2.1 will be fulfilled in ENR 2100 (Lecture)

ENR 2100 - Exams (2 exams per semester, 25% each, 50% total): Students will complete a total of 2 exams each semester. Each exam will consist of 50 questions that focus on 7 weekly course modules. Exams will be completed using Carmen and open for 7 days to accommodate all students. Each exam will be unique and worth 25% of a student's Final Grade for ENR 2100. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Exams will focus on readings, lecture slides and lecture presentations. Exams are open-book, however, students must complete the work on their own without help from peers.

ENR 2100 - Objectives of exams:

1. Evaluate student learning at the end of weekly course modules.
2. Assess reading comprehension, problem solving skills, critical thinking and vocabulary usage.
3. Assess understanding of key concepts principles, theories, and methods.

ENR 2100 - For each exam, students will be required to:

1. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on lecture slides and lecture presentations given by the instructor.
2. Analyze and interpret data presented in figures, graphs and tables.
3. Use reasoning skills to solve problems using mathematics and statistics.
4. Make quantitative comparisons of data presented in graphs and tables.

Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 2.2 will be fulfilled in ENR 2100 (Lecture)

ENR 2100 – Writing Assignments (5 assignments per semester, 5% each, 25% total):

Students will complete a total of 5 writing assignments each semester, all of which will be submitted on Carmen. Each assignment will be unique and worth 5% of a student's Final Grade in ENR 2100. Assignments will be open on Carmen for 14 days to accommodate all students. Readings, data sets, documentaries that are required for writing assignments will all be free and provided through Carmen or links to these materials will be provided on Carmen. These assignments are open-book, however, a student must complete the work on their own without help from peers.

ENR 2100 - Objectives of writing assignments:

1. Locate primary source journal article using Web of Science, PubMed or another search engine.
2. Understand how journal articles are organized (e.g., abstract, introduction, results) and how to read an article, find information, interpret data and become proficient at reading and understanding figures, graphs and tables.
3. To make informed decisions and develop potential solutions to environmental issues based on published scientific articles, results and data.
4. Develop skills and gain experience in scientific writing and how to effectively present data using figures and tables.
5. Gain an appreciation for how discoveries in natural science often requires collaboration between many scientists from many different specializations.

ENR 2100 - For each writing assignment, students will be required to:

1. Answer short-answer and essay-style questions. These questions will be based on readings, documentaries or data provided by academic or governmental institutions. Some questions will require students to use formulas and equations, complete calculations, calculate statistical values, plot data, produce tables, and describe procedures and experimental approaches.
2. Use reasoning skills to propose method, protocol or technique that could be utilized to solve an environmental problem.
3. Evaluate the economic, social and ethical implications of scientific discoveries and new technologies.

Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 2.3 will be fulfilled in ENR 2100 (Lecture)

ENR 2100 - Quizzes (5 quizzes per semester, 5% each, 25% total): Students will complete a total of 5 quizzes each semester, all of which will be completed using Carmen. Quizzes will be open for 7 days to accommodate all students. Each quiz will contain 10-20 questions that focuses on 1-2 weekly course modules. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Each quiz will be unique and worth 5% of the Final Grade for ENR 2100. These quizzes are open-book, however, students must complete the work on their own without help from peers. Quizzes will focus on readings and course materials.

ENR 2100 - Objectives of quizzes:

1. Understand how data is collected by scientists, why replication is important in experiments. Analyze the process of scientific inquiry, principles, theories and methods of natural science.
2. Critically evaluate and responsibly use information from the natural sciences. Analyze data using statistics.
3. Learn how our knowledge and understanding about a scientific discipline has changed over time through the generation of testable explanations and predictions, newfound knowledge, new techniques and new instrumentation.
4. Recognize social and ethical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

ENR 2100 - For each quiz, students will be required to:

1. Read articles, book chapters and/or technical reports provided by instructor on Carmen or Ohio State Libraries. Watch short documentaries or instructional videos. There will be no cost to the student, all readings and videos will be free.
2. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on the articles and book chapters that students read, documentaries and instructional videos that students watch and data that students collect and analyze.