

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?)

(1) by changing the course number to 2911, because, as it evolved, this course has become more challenging for most of its students, and (2) changing the short name from 'Climate Change' to 'The Climate Crisis'

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

Now that the entire GE system is being re-organized at OSU, we propose to continue the course, with no abrupt change in scope or content, but modifying its status and description in two minor ways: (1) by changing its course number to 2911, because, as it evolved, this course has become more challenging for most of its students, and (2) by changing its short name from 'Climate Change' to 'The Climate Crisis', because the present-day climate crisis is the major focus of the course, not just the general phenomenon of climate change, a theme that runs throughout geological history (though that history does provide an important backdrop to the study of anthropogenic climate change).

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?)

None

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)

This course is cross-listed in History and EarthSC

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Evol, Ecology & Organismal Bio
Fiscal Unit/Academic Org	Evolution, Ecology & Org Bio - D0390
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	2911
<i>Previous Value</i>	1911
Course Title	The Climate Crisis: Mechanisms, Impacts, and Mitigation
<i>Previous Value</i>	<i>Climate Change: Mechanisms, Impacts, and Mitigation</i>
Transcript Abbreviation	IntrdiscpClimtChng
Course Description	Examination of the basic science of climate change, of the ability to make accurate predictions of future climate, and of the implications for global sustainability by combining perspectives from the physical sciences, the biological sciences, and historical study. Team-taught with faculty members in EarthSc and History.
Semester Credit Hours/Units	Fixed: 4

Offering Information

COURSE CHANGE REQUEST
2911 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette
Chantal
03/21/2022

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture, Recitation
Grade Roster Component	Recitation
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark, Wooster
Previous Value	Columbus, Marion

Prerequisites and Exclusions

Prerequisites/Corequisites	
Exclusions	Not open to students with credit for History 1911, History 2911, EarthSc 1911 or EarthSc 2911.
Previous Value	Not open to students with credit for History 1911 or EarthSc 1911.
Electronically Enforced	Yes

Cross-Listings

Cross-Listings	Cross-listed in EarthSc and History.
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Subject/CIP Code

Subject/CIP Code	40.0601
Subsidy Level	Baccalaureate Course
Previous Value	General Studies Course
Intended Rank	Freshman, Sophomore, Junior, Senior
Previous Value	Freshman, Sophomore

Requirement/Elective Designation

General Education course:
Historical Study; Biological Science; Physical Science; Citizenship for a Diverse and Just World; Lived Environments; Sustainability
The course is an elective (for this or other units) or is a service course for other units

[Previous Value](#)

[General Education course:](#)
[Historical Study; Biological Science; Physical Science](#)

Course Details

Course goals or learning objectives/outcomes

- Students understand the modern scientific consensus on the causes and mechanisms of climate change
- Students appreciate the complex nature of the climate system, including the vital role of the oceans
- Students recognize the spatial heterogeneity of the effects of climate change
- Students recognize the impact of past climate change on humans, including droughts, agricultural collapse, and resulting wars over limited resources
- Students understand the basic choices available to societies to slow down, mitigate, or adapt to climate change

Content Topic List

- The Climate System
 - CO2 and Climate Change
 - Biological Responses to Climate Change
 - Historical Experiences of Major Climate Change
 - Effects of Climate Change on Modern Human Infrastructure
 - Human Response to Climate Change: Mitigation and Adaptation
- No

Sought Concurrence

Attachments

- EEH1911 SYLLABUS Autumn 2021.docx: Old Syllabus
(Syllabus. Owner: Hamilton, Ian M)
- EEOB Curriculum Maps November 2021.xlsx: EEOB Curriculum Maps
(Other Supporting Documentation. Owner: Hamilton, Ian M)
- The Climate Crisis 2911 - title and number change.docx
(Cover Letter. Owner: Hamilton, Ian M)
- EEH2911 SYLLABUS Autumn 2022 Dec 13 2021.docx: New Syllabus
(Syllabus. Owner: Hamilton, Ian M)
- submission-doc-citizenship Dec 13 2021.pdf
(Other Supporting Documentation. Owner: Hamilton, Ian M)
- submission-lived-environments Dec 13 2021.pdf
(Other Supporting Documentation. Owner: Hamilton, Ian M)
- submission-sustainability Dec 13 2021.pdf
(Other Supporting Documentation. Owner: Hamilton, Ian M)
- interdisciplinary-team-taught-inventoryES2911.pdf
(Other Supporting Documentation. Owner: Hamilton, Ian M)
- EEH2911 SYLLABUS Autumn 2022 revised March 3 2022.docx: Revised Syllabus March 3
(Syllabus. Owner: Hamilton, Ian M)
- Response to Natural and Mathematical Sciences Panel of the ASC Curriculum Committee.pdf: Response to Panel
(Other Supporting Documentation. Owner: Hamilton, Ian M)

COURSE CHANGE REQUEST
2911 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette
Chantal
03/21/2022

Comments

- Earth Science and History will also submit this request

History and Earth Science 2911 have been added to the exclusions

The Interdisciplinary Team-Taught Course Inventory is attached

Please see the response to panel for responses to the feedback email sent 2-7-22 *(by Hamilton, Ian M on 03/03/2022 01:08 PM)*

- Please see feedback email sent to the departments/unit 2-7-22 RLS *(by Steele, Rachel Lea on 02/07/2022 03:35 PM)*

- -On the form in curriculum.osu.edu, History and Earth Science 2911 now need to be exclusions as well.

-Please fill out and upload the Interdisciplinary Team-Taught Course Inventory

<https://oaa.osu.edu/sites/default/files/uploads/general-education-review/new-ge/interdisciplinary-team-taught-inventory.pdf> (might be helpful to read OAA instructions <https://oaa.osu.edu/sites/default/files/uploads/general-education-review/new-ge/interdisciplinary-team-courses-description-expectations.pdf>) *(by Vankeerbergen, Bernadette Chantal*

on 01/04/2022 03:49 PM)

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Hamilton, Ian M	12/14/2021 02:08 PM	Submitted for Approval
Approved	Hamilton, Ian M	12/14/2021 02:10 PM	Unit Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	01/04/2022 03:55 PM	College Approval
Submitted	Hamilton, Ian M	01/12/2022 12:38 PM	Submitted for Approval
Approved	Hamilton, Ian M	01/12/2022 12:39 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	01/18/2022 11:51 AM	College Approval
Revision Requested	Steele, Rachel Lea	02/07/2022 03:35 PM	ASCCAO Approval
Submitted	Hamilton, Ian M	03/03/2022 01:09 PM	Submitted for Approval
Approved	Hamilton, Ian M	03/03/2022 01:14 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	03/21/2022 10:14 AM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	03/21/2022 10:14 AM	ASCCAO Approval

EARTHSC/EEOB/HISTORY 2911: The Climate Crisis

An interdisciplinary course offered jointly by the Departments of Earth Sciences, Evolution, Ecology and Organismal Biology and History

Autumn 2021

Lectures: Tuesday and Thursday 2:20PM - 3:40PM

Room: TBD

Recitations: See below.

Room: Mendenhall Laboratory Room 163

Course Description

This course provides a multidisciplinary introduction to the causes of climate change, its consequences for Earth, life, and society, and what we can do about it. This course was developed and will be taught by a team of professors and teaching associates from geoscience, biology, and history. Students will acquire insights from all these disciplines to address the most critical issue of our time. No background in the natural or social sciences is required, other than those described in the Ohio (and most other state) K-12 content standards.

Instructors:

Prof. Michael Bevis, School of Earth Sciences, 275 Mendenhall Lab, bevis.6@osu.edu (247-5071)

Office hours: Thursday 4:00-5:00PM, or by appointment

Zoom Link: <https://osu.zoom.us/j/92081922931?pwd=eTJqTjVQaVpidy9ta1RyM243bXVVdz09>

Password: 767588

Prof. John Brooke Email: brooke.10@osu.edu: 273 Dulles Hall 614-292-8757 [Realistically, I will not be at this phone much this semester, but I respond to email quickly, messages here appear on my email]

Office hours: Wednesday 1:00-3:00 or by appointment

Zoom link: <https://osu.zoom.us/j/98667445846?pwd=T1NvT2d6cmIuOVFVTUJKZ3lyS1ppQT09>

Password: 141483

Prof. Jim Hood, Department of Evolution, Ecology and Organismal Biology, 230 Research Center.

hood.211@osu.edu (292-5383) office hours: Tuesday/Thursday 1:00-2:00 (or by appt.)

Zoom link: <https://osu.zoom.us/j/92724703574?pwd=SGpQWC9aYUJ5MThWVG82VGF2RFBhUT09>

Password: EEH1911

All recitations meet in Mendenhall Lab, 163 <[map](#)>

Recitation Staff:

Teresa Avila (Earth Science) avila.75@osu.edu

Recitations:

We 12:40PM - 1:35PM 21106 35198 35281

We 1:50PM - 2:45PM 21108 35200 35283

Office hours: Wednesdays, 3:00-4:00, and by appointment

Zoom link: <https://osu.zoom.us/j/8515487775?pwd=NTM1bVhWVXFrdDJkUytUZjJNaEQvdz09>

password: carbonate

Ives Hartman, (History) Dulles Hall hartman.637@buckeyemail.osu.edu

Recitations:

Mo 9:10AM - 10:05AM 21101 35193 35276

Mo 10:20AM - 11:15AM 21103 35195 35278

Office hours: Tuesday, 12:00-2:00PM, or by appointment

Zoom link: <https://osu.zoom.us/j/95326548081?pwd=TGNxTk1zOVVYRE9JbzI0NmJ4MWFhdz09>

Password: 028875

Ben Kurtz (Earth Science) kurtz.359@osu.edu

Recitations:

Mo 9:10AM-10:05AM 21101 35193 35276

We 9:10AM-10:05AM 21102 35194 35277

Office hours: Wednesdays, 2:00-3:00p, and by appointment

Zoom link: <https://osu.zoom.us/j/8103863431?pwd=TnJsWE9BYkRqd2dpNjQvRys3TWJhZz09>

Passcode: 578080

Imran Razik (EEOB) Aronoff Laboratory razik.2@osu.edu

Recitations:

Mo 12:40PM - 1:35PM 21105 35197 35280

Mo 1:50PM - 2:45PM 21107 35198 35282

Office hours: Monday 3:00-4:00PM, and by appointment

Zoom link: <https://osu.zoom.us/j/95330723273?pwd=MCt6SmZqVFVJR216amZsNWZVek5vZz09;>

password: 911699

ALL Students enrolled in EARTHSC/EEOB/HIST 2911: Note that the course hours earned in this class do not count as upper-division hours required for graduation.

Some important information in this course:

Lectures will have a Top-Hat component, which will determine your participation grade, so you will need attend the lecture in person at the scheduled time. Recitations will be in person, all in Mendenhall Lab 163, a large room. They will have graded components that will require participation at the scheduled time. Please see details below, and the “Course technology” section on the last page.

We hope that you have a safe and productive semester. Getting or transmitting Covid-19 is really no joke. We are all in this thing together! The university asks that we all review the health guidelines at <https://safeandhealthy.osu.edu/> (Links to an external site.) and requires that we all take the Buckeyes Together pledge. Please attend to your mental health as well, and review resources and strategies here <https://safeandhealthy.osu.edu/mental-health-wellness>.

We will be making announcements on Carmen, and copying these announcements into emails to the class. Please regularly check your Carmen page for announcements. Currently all office hours will be held via Zoom.

Please put the course number [2911] in any emails that you send to us. We get a lot of messages, and we teach more than one course!

Grading: Grading for this course is calculated on a 1000 point scale, corresponding to 100% of your grade:

Lectures: 60% [600 pts]	Top Hat lecture questions: 5% [30 points *4 modules] = 120 pts Each unit exam: 15% [120 points* 4 exams] = 480 pts
Recitation Participation: 20% [200 points]	Pre-Reports: 12% [10 points * 12 recitations] = 120 pts Group Reports: 8% [6-7 points * 12 recitations] = 80 pts
Other Assignments: 20% [200 pts]	Newspaper Articles and Comments: 6% [20 points * 3 each] = 60 pts Paper or PowerPoint Prospectus: 2% = 20 pts Final Paper or PowerPoint: 12% = 120 pts
TOTAL: 100%	= 1000 pts

NOTES on Recitation Participation: Grades will be assigned to your participation in both “Pre-reports” (individual comments posted to Carmen before recitation); and “Group reports” (commentary posted to Carmen by your assigned Group, at the end of recitation); [there are 12 recitations on the current syllabus]

Major assignment due date overview:

Unit exam, Section 1: Mechanisms	Sept. 20 [Monday]
Unit exam, Section 2: Economies, energy	Oct. 11 [Monday]
Paper or PowerPoint Prospectus due in recitation	Nov. 1, 3
Unit exam, Section 3: Impacts	Nov. 19 [Friday]
Unit exam, Section 4: Mitigation	Dec. 8 [Thursday]

Papers, by students who have chosen this option, are due on Carmen, Friday, Dec. 10, 400PM
PowerPoint project option is due on Carmen Thursday Dec. 9, by 6:00PM
PowerPoint presentations will take place on Friday Dec. 10, 4:00-6:00PM. [Note: this is our exam day and time, so there should be minimal conflicts.]

Lecture questions and unit-exams

There will be short sets of questions during the lectures, delivered via Top-Hat. To accommodate the unique uncertainty associated with this semester, we will drop the lowest day’s score on these in-lecture questions.

There will be four unit-exams on Sept. 20, Oct. 11, and Nov. 19, Dec. 8. You will have eighty minutes to complete each exam during the regular class meeting time. If you are unable to take the exam during the regular class time, you will need to make alternative arrangements by 5pm on the day before the exam (Sept 19, Oct 10, Nov. 19, Dec 8). Unit-exam questions will focus on material covered in current lectures and readings, however some key material will be cumulative.

Recitation Participation

The Recitations will be conducted in person in Mendenhall Labs, Room 163, at the scheduled times. We expect our students to attend and participate in all scheduled recitation sections, having read all assigned readings for that week, and to participate regularly in the discussions taking place in these recitations. Recitations will be divided into four-person pods, which will work together throughout the course. To accommodate the unique uncertainty associated with this semester, we will drop the lowest recitation day’s participation score at the end of the semester.

Newspaper Articles and Discussion

Elements of several of the earlier recitation sections will be built around the formation and discussion of electronic news article “scrapbooks.” Students are expected to contribute three articles to their recitation-

pod scrapbook. Submissions should be accompanied by a paragraph explaining the content, why you found the article particularly important or compelling, and how it relates to the course. Regular submission of appropriate articles from major respectable news sources will earn full credit for this portion of the course grade. Please see the instructions on Carmen for further details.

Final project:

There will be **two options for a final project**: a group-developed PowerPoint presentation or a short individual research paper. Building from the course material, the newspaper article collections developed in the recitation groups, and your own research, papers or PowerPoints will explore a particular dimension of the wider problem of climate change past, present, and future, appropriately informed by the geophysics, biology, and/or history of climate change.

Option A: PowerPoint Project.

EEH2911 PowerPoint Projects option offer you the opportunity to work in small groups, exploring a particular dimension of the wider problem of climate change past, present, and future, appropriately informed by the geophysics, biology, and/or history of climate change. Your PowerPoint group will be drawn typically from your recitation pod. The PowerPoint groups will distribute the research and production responsibilities equitably, and specify them in the Poster Prospectus, which are due for review in recitation on Nov. 1, 3. The project involves two required steps: (1) a prospectus; (2) a delivered PowerPoint, turned in on Carmen on Dec. 9 and presented on Zoom by all members of the group to a team of instructors on Dec. 10. Part of the grading will be based on the effectiveness of the PowerPoint group teamwork. Further information can be found in “Research Guidelines” the “PowerPoint Instructions” posted to the course Carmen site.

Option B: Individual essay.

Alternatively, you may write an essay of ~1,200 words with citations, exploring a particular dimension of the wider problem of climate change past, present, and future, appropriately informed by the geophysics, biology, and/or history of climate change. Your papers should be informed by the course material, the newspaper article collections developed in the recitation pods, and your own research. Your Paper Prospectus is due for review in recitation on Nov. 1, 3. Your paper will be due on December 10. Further information can be found in “Research Guidelines” the “Essay Instructions” posted to the course Carmen site.

Numeric/letter grade scale: when we grade on a numerical scale, these are the conversions to letter grades.

A	93-100	C+	77-79.9
A-	90-92.9	C	73-76.9
B+	87-89.9	C-	70-72.9
B	83-86.9	D	60-69.9
B-	80-82.9	E	0-59.9

Faculty feedback and response time

(Remember that you can call **614-688-HELP** at any time if you have a technical problem with Carmen. Please the last page for “Course Technology”.)

- **Grading and feedback:** For major assignments, you can generally expect feedback within 10 days. Recitation grading generally will be available in at least 48 hours
- **Email:** We will reply to emails within **24 hours on days when class is in session at the university.**

Course Policies

Attendance:

The lectures will be conducted in person, with Top-Hat mini-quizzes, open mike sessions, and question periods initiated by TA monitored chat functions. Participation in these activities, especially the Top-Hat mini-quizzes, is calculated into your lecture attendance grade. If you will be missing the scheduled lecture and have a valid excuse (medical, COVID19-related, or compassionate reasons only), please inform your TA, and you will have access to a Carmen quiz following viewing the recorded lecture you will be provided with a makeup assignment for the participation points and mini-quizzes. While we appreciate that life may conflict with lecture every once in a while, particularly during these turbulent and difficult times, double-booking another regularly scheduled event (e.g., a different class, exam, or work) with lecture will not be excused.

The recitation in this course employs structured, cooperative groups for many graded activities; absence of a group member can harm group members attending recitation. Therefore, all students should complete the course readings and other activities and attend every lecture and their scheduled recitations. Class meetings will usually include in-class assignments and quizzes, so missing class will lower your grade.

You should attend the recitation section in which you are enrolled. If you miss or know you will miss your assigned recitation section (e.g. for a scheduled health care appointment), and can attend an earlier or later section, work with your TA to arrange attending the other section. Note, this will disrupt interactions with your cooperative group, and we will try to minimize how often it occurs.

Submitting Work: Please submit all assignments in a MS Word compatible format (.doc, .docx, .txt., or .rtf) online on Carmen. Work will not be considered complete until it is has been uploaded in a readable format. If we cannot read it, we cannot grade it or even comment on it.

Late Work: Late assignments will have 10% deducted for every day late, weekends included. The only exceptions will be extensions granted ahead of time or serious documented emergencies.

Statement on Plagiarism and Misconduct: OSU has a strict code of academic misconduct that requires us to report any and all cases of suspected misconduct (e.g., plagiarism in written assignments, etc.) to the OSU Committee on Academic Misconduct for adjudication. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>. We adhere to this policy. You should understand the nature and consequences of plagiarism (and of anti-plagiarism sites like www.turnitin.com). The OSU Writing Center: <http://cstw.osu.edu> provides more information on proper citing of your sources of information.

Grade Grievances and Other Academic Complaints: Students with complaints about courses, grades, and related matters should first bring the matter to **one of** the instructors.

Students enrolled in EARTHSC 2911 or EEOB 2911: If the student and the instructor cannot arrive at a mutually agreeable settlement, the student may appeal further to the College of Arts and Sciences. For additional information see the Office of Undergraduate Education (<https://ugeducation.osu.edu/complaint-grievance-and-appeal-procedures/>) and the Office of

Student Life: Student Advocacy Center (<https://advocacy.osu.edu/academic-enrollment/grade-grievance/>).

Students enrolled in HIST 2911: Dept. of History Grievance guidelines: If the student and the instructor cannot arrive at a mutually agreeable settlement, the student may take the complaint to the vice chair of the department, David Brakke (.2), who will investigate the matter fully and attempt to resolve it. If the vice chair is involved, the student should contact the department chair, Scott Levi (.18). The student may appeal further to the College of Arts and Sciences. Any student with a grievance may seek advice from the department's grievance resource officer, Birgitte Soland (.1).

University and course policies:

Covid-19 instructions: We take this opportunity to remind you of the Ohio State Health and safety requirements. The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's [request process](#), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let us know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with your assigned TA as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Statement on Disability Services: 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 Dr. Hood know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with Dr. Hood as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Statement of 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. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling [614-292-5766](tel:614-292-5766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of

Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:614-292-5766) and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Statement on Diversity: The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential.

Statement on Sexual Misconduct/Relationship Violence: Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

Statement on Counseling Services: Should you find yourself experiencing personal difficulties, whether related to class or not, please know that you have access to confidential services provided by the University. Details can be found here <https://safeandhealthy.osu.edu/mental-health-wellness>.

Statement on Accessibility: 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. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Land Acknowledgement: The Ohio State University acknowledge that its campuses have long served as sites of meeting and exchange for Indigenous peoples, including those in historical times known as the Shawnee, Miami, Wyandotte, Delaware, and the People of Fort Ancient, Hopewell, and Adena cultures, also known as the earthworks builders, as well as other tribal nations of the region. The Ohio State University honors and respects the diverse Indigenous peoples connected to this land in which we gather.

Prior to Autumn 2022 GE requirements: This course may fulfill any one (only) of the following: GE Historical Study, GE Natural Science: Biological Science, GE Natural Science: Physical Science.

Physical and Life Science Learning Goals:

1. Students understand the basic facts^{*}, principles, theories and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

Rationale for Meeting Physical and Life Science Learning Goals:

1. We will examine the basic facts, principles and theories of climate, climate change and climate change impacts, both from physical and biological perspectives. This includes a study of scientific methodology.
2. Much of the scientific content of this course will be organized around the history of the related observational and theoretical advances, and the progressive development of the modern understanding and the predictive power of climate change science.
3. Climate change is largely driven by human practices tied to our energy technologies and industries and our need for resources such as food, space and raw materials. Scientific investigation has helped diagnose the problem, and identify solutions: these solutions will involve the development and large-scale deployment of new technologies.
4. Climate change is one of the most important and critical issues facing the contemporary world. It exemplifies the ‘unintended consequences’ of science and technology, as they have been developed and deployed in the global economy. The spatially and socially uneven impacts of global change also raise important moral, legal, social and political issues. Science and technology have contributed to climate change but can also be part of the solution.

History Learning Goals:

History courses develop students’ knowledge of how past events influence today’s society and help them understand how humans view themselves.

1. Students acquire a perspective on history and an understanding of the factors that shape human activity.
2. Students display knowledge about the origins and nature of contemporary issues and develop a foundation for future comparative understanding.
3. Students think, speak, and write critically about primary and secondary historical sources by examining diverse interpretations of past events and ideas in their historical contexts.

Rationale for Meeting History Learning Goals:

1. Students will explore past climate changes and how they influenced human economies, societies, and cultures.
2. Students will learn about the technological, business, and political developments that led to contemporary global warming and have obstructed political responses.
3. Students will read and discuss original historical accounts documenting climatic changes and impacts.

New GE (Autumn 2022 and on) Theme Goals & ELOs

This course may fulfill the following any one (and only one) of the following GE Themes:

Sustainability: GE Goal and Expected Learning Outcomes for Sustainability Theme courses:

GOALS: Successful Students will (1) analyze sustainability at a more advance and in-depth level than in the foundations; (2) integrate approaches to sustainability by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or work they have done in previous classes and that they anticipate doing in the future; and (3) (specific to *Sustainability Theme*) analyze and explain how social and natural systems function, interact, and evolve over time; how human wellbeing depends on these interactions; how actions have impacts on subsequent generations and societies globally; and how human values, behaviors, and institutions impact multi-faceted, potential solutions across time.

EXPECTED LEARNING OUTCOMES: Successful students are able to: (1.1) engage in critical and logical thinking about sustainability; (1.2) engage in advanced, in-depth, scholarly exploration of sustainability; (2.1) Identify, describe and synthesize approaches or experiences as they apply to sustainability; (2.2) Demonstrate a developing sense of self as a learner through reflection, self-assessment and creative work, building on prior experiences to respond to new and challenging contexts; (3.1) (specific to *Sustainability Theme*) describe elements of the fundamental dependence of humans on Earth and environmental systems and on the resilience of these systems; (3.2) describe, analyze and critique the roles and impacts of human activity and technology on both human society and the natural world, in the past, currently, and in the future, and (3.3) devise informed and meaningful responses to

problems and arguments in the area of sustainability based on the interpretation of appropriate evidence and an explicit statement of values.

This course fulfills these Sustainability Theme goals by: having students learn how scientists make measurements and build models to explore the role of humans in recent climate change and in implementing sustainable solutions, drawing upon cutting-edge research findings from peer-reviewed literature, including the most recent Intergovernmental Panel on Climate Change (IPCC) and National Climate Assessment reports. Students also learn the nature of scientific evidence for anthropogenic climate change, the history of past climates, and how Earth's climate is interconnected to the evolution of life on Earth and a sustainable future. Students learn about natural feedbacks which mitigate the influence of fossil carbon emissions on warming (i.e., confer resilience) and which amplify warming through positive feedbacks (e.g., melting permafrost). These lessons are supported by recitations which challenge students to generate simulations exploring how energy transitions (e.g., wind to coal to renewable energy) could influence the climate as well as human well-being and sustainability (e.g., students calculate their ecological footprint - similar to the carbon footprint - and explore sustainable ways to reduce their ecological footprint).

Lived Environments: GE Goal and Expected Learning Outcomes for Lived Environments Theme courses:

GOALS: Successful Students will (1) analyze the framework of “Lived Environments” at a more advanced and in-depth level than in the foundations; (2) integrate approaches to “Lived Environments” by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or work they have done in previous classes and that they anticipate doing in the future; and (3) analyze and explain how social and natural systems function, interact, and evolve over time; how human wellbeing depends on these interactions; how actions have impacts on subsequent generations and societies globally; and how human values, behaviors, and institutions impact multi-faceted, potential solutions across time.

EXPECTED LEARNING OUTCOMES: Successful students are able to: (1.1) engage in critical and logical thinking about Lived Environments; (1.2) engage in advanced, in-depth, scholarly exploration of Lived Environments; (2.1) Identify, describe and synthesize approaches or experiences as they apply to Lived Environments; (2.2) Demonstrate a developing sense of self as a learner through reflection, self-assessment and creative work, building on prior experiences to respond to new and challenging contexts; (3.1) describe elements of the fundamental dependence of humans on Earth and environmental systems and on the resilience of these systems; (3.2) describe, analyze and critique the roles and impacts of human activity and technology on both human society and the natural world, in the past, currently, and in the future, and (3.3) devise informed and meaningful responses to problems and arguments in the area of Lived Environments based on the interpretation of appropriate evidence and an explicit statement of values.

This course fulfills these Lived Environments Theme goals by: having students develop both scientific and humanities-based approaches to understanding the place of humanity in the web of natural and built environments, through a close examination of the structure, history, and future of the human relationship with the earth climate systems. By studying the mechanisms of anthropogenic climate change, the human history of past climates, and the challenges and opportunities of the transition to a carbon-neutral economy, students come to an understanding the complex ways in which social lives are environmentally embedded. The coupling between human and natural systems are local and tangible, but they are also fundamentally global, and students develop a sense of the planet as a common environment for humanity. We examine how, prior to the last several hundred years, the earth's climate system impacted on humanity and then how – in the past several hundred years – human economies and demographics have begun to reshape global climate dynamics. Students come to an understanding of the increasingly blurred

boundary between natural and built environments on the planetary scale, as climate change leads to climate mitigation, and perhaps intervention.

Citizenship for a Diverse and Just World: GE Goal and Expected Learning Outcomes for Citizenship Theme courses:

GOALS: Successful Students will (1) analyze sustainability at a more advance and in-depth level than in the foundations; (2) integrate approaches to sustainability by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or work they have done in previous classes and that they anticipate doing in the future; and (3) (specific to *Sustainability Theme*) explore and analyze a range of perspectives on citizenship, across local, national, and global, and apply the knowledge, skills, and dispositions that constitute it; and (4) examine notions of justice amidst difference and analyze and critique how these interact with historically and socially constructed ideas of citizenship and membership within societies, both within the US and/or around the world

EXPECTED LEARNING OUTCOMES: Successful students are able to: (1.1) engage in critical and logical thinking about citizenship; (1.2) engage in advanced, in-depth, scholarly exploration of citizenship; (2.1) Identify, describe and synthesize approaches or experiences as they apply to citizenship; (2.2) Demonstrate a developing sense of self as a learner through reflection, self-assessment and creative work, building on prior experiences to respond to new and challenging contexts; (3.1) (specific to *Sustainability Theme*) describe and analyze a range of perspectives on what constitutes citizenship and how it differs across political, cultural, national, global, and/or historical communities.; (3.2) identify, reflect on, and apply the knowledge, skills and dispositions required for intercultural competence as a global citizen, (3.3) examine, critique, and evaluate various expressions and implications of diversity, equity, inclusion, and explore a variety of lived experiences; and (3.4) analyze and critique the intersection of concepts of justice, difference, citizenship, and how these interact with cultural traditions, structures of power and/or advocacy for social change.

This course fulfills these Citizenship Theme goals by: having students think critically about the evidence for how human activities are altering the climate and what citizens can do to mitigate the effects of climate change that often adversely affect the most vulnerable populations who have done the least to cause climate change. Students learn about how climate change skepticism perpetuated by those who profit from the oil and gas industry is based on misinformation and is like the skepticism over cigarette smoking perpetuated by those who profit from the tobacco industry. Students learn to apply fact-based knowledge as responsible citizens to decision making processes at multiple levels in their lives (individual, community, and policy) and to understand that the challenge of catastrophic warming requires citizens thinking beyond the static here and now of their lives to consider the consequences of their own actions and those of communities, economies, and nations around the world. Students will learn that the politics of the Anthropocene requires that American students understand the disproportionate historical impact that the American economy has had in driving the trajectory toward a rapidly warming planet.

Readings

All required readings, or links to them, will be posted to Carmen. There is no *required* textbook for the course.

Note: Syllabus is subject to limited change with advanced notice. There will be no change in the length and number of assignments.

Weekly Schedule:

Week 1

August 24: Introduction to the course: questions, structure, and goals [all]

*No recitations this week

SECTION 1: MECHANISMS: CLIMATE SYSTEMS & GREENHOUSE GAS CYCLES.

August 26: Weather and Climate [MB]

Week 2

Recitations Aug. 30, Sept. 1: How does the IPCC arrive at recommendations about climate change and what are its most important recommendations?

August 31: Solar radiation and the Greenhouse Effect [MB]

September 2: Atmospheric and Oceanic Circulation [MB]

Week 3

Recitations: NONE – Labor Day on Monday. Sept. 6

September 7: The Discovery of Global Warming [MB]

September 9: Paleoclimatology and the Fragility of the Climate System [MB]

Week 4

Recitations Sept. 13, 15: Understanding the Global Carbon Cycle

September 14: Anthropogenic and natural sources of global warming gasses [JH]

September 16: ½ GHG cont. [JH]; ½ The climate system can be save! [MB]

September 20 Monday SECTION 1 EXAM – AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-exam description on p. 3

SECTION 2: ECONOMIES, ENERGY AND CLIMATE: AN HISTORICAL OVERVIEW

Week 5

Recitations Sept. 20, 22: Poster and essay planning: Discuss the key themes in the EEH2911 student newspaper posts.

September 21: Climate, energy, and humanity: evolutionary origins through the origins of agriculture [JB]

September 23: Climate and Crisis: Agriculture, Disease, and Warfare in the [Holocene] Ancient and medieval worlds [JB]

Week 6

Recitations Sept. 27, 29: Climate and premodern energy transitions

September 28: The Little Ice Age and the First Globalization: the opening to modernity [JB]

September 30: Energy and Economies: The First Industrial Revolution [JB]

Week 7

Recitations Oct. 4, 6: What have been the key features of the energy transitions since 1800?

October 5: Energy and Economies: The Second Industrial Revolution [JB]

October 7: Energy and greenhouse emissions [JB]

Monday October 11: SECTION 2 EXAM – AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-exam description on p. 3

SECTION 3: MODERN CLIMATE CHANGE IMPACTS

Week 8

Recitations: NONE – fall Break [Note: Sect. II Exam on Monday, Oct. 11]

October 12: Emission, economies, and climate change impacts through time; Some thoughts on population growth [JB]

October 14: NO CLASS – Fall Break

Week 9

Recitations Oct. 18, 20: Poster and essay planning: preliminary research plan

October 19: Intensification of the Hydrological Cycle [MB]

October 21: Ice loss, Water Resources and Seal Level Rise [MB]

Week 10

Recitations Oct. 25, 27: How much corn and how many cows can you raise on the oval?

October 26: Background: value of biodiversity & ecosystem services [JH]

October 28: Impact of climate change on environmental suitability for nature & people [JH]

Week 11

Recitations Nov. 1, 3: What is your ecological footprint? **Your PowerPoint or paper prospectus is due in recitation**

November 2: Impact of extreme events: heat waves, fires, and floods [JH]

November 4: Effect on biodiversity: extinctions and changes in biogeography and biological timing [JH]

Week 12

Recitations Nov. 8, 10: What is the impact of climate change on agriculture in the United States?

November 9: Boreal Forest: impacts and feedbacks [JH]

November 11: NO CLASS – Veterans Day

Week 13

Recitations Nov. 15, 17: How do citizens and the policy-makers they elect understand (or not) the science on which to base today's public policies

November 16: Agriculture, fisheries, and food production systems [JH]

Friday: 19 Nov: SECTION 3 EXAM – AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-exam description on p. 3

SECTION 4: MITIGATING CLIMATE CHANGE

November 18: Conservation planning for persistence, resistance, and resilience [JH]

Week 14

November 23: Renewable Energy, Energy Storage, and Energy Efficiency, Day 1 [MB]

Recitations: NONE Thanksgiving break starts Nov. 24

November 25: NO CLASS Thanksgiving break

Week 15

Recitations Nov. 29, Dec. 1: What is required to drive the next energy transition?

November 30: Renewable Energy, Energy Storage, and Energy Efficiency, Day 2 [MB]
December 2: Global Climate Change Politics: Fears, Denial, and Future Scenarios [JB]

Week 16

December 7: Can our Climate System be 'Saved'? [MB]
No recitations this week

December 8: Short Final **Exam** on-line: *AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-exam description on p. 3*

Final Assignments:

Option A:

PowerPoint project option is due on Carmen Thursday, Dec 9, by 6:00PM.
PowerPoint presentations will take place on Zoom on Friday December 10, 4:00-6:00PM. **[Note: this is our exam day and time, so there should be minimal conflicts.]**

Option B:

Papers, by students who have chosen this option, are due on Carmen, Friday December 10, 4:00PM

* We agree with the report of the Special Commission of the National Academy of Sciences that has stated, "Any education that focuses predominantly on the detailed products of scientific labor — the facts of science — without developing an understanding of how those facts were established, or that ignores the many important applications of science in the world, misrepresents science and marginalizes the importance of engineering." (doi.org/10.17226/13165.)

TOP HAT POLICIES AND USAGE

- Access by smartphone or computer web browser. Texting option available as well.
- Sign for a Top Hat account at <https://app.tophat.com/login> (do NOT select the SSO bypass option) using your OSU username/password and there is no cost to you.
- Once you have an account, you will be able to enter the join code #984971 or search for the course “1911 Fall 2020 Climate Change” to be enrolled.
- It is useful to browse the student support pages at <https://support.tophat.com/s/categoryhome/Student> and if you have questions you are encouraged to call Top Hat or email at support@tophat.com.
- Using Top Hat, points are awarded for questions answered correctly in class –in other words, we have daily ‘quizzes’.
- There will also be bonus points for participation in class using Top Hat (some questions are opinion or thought questions).
- Accommodation will be made for students with disabilities.

TOP HAT POLICIES AND USAGE: GRADING

- Review questions will be asked during lecture based on material from the previous class (in-class ‘quizzes’). There will be about 3 questions per lecture on average, but anywhere from 1-10 is possible.
- For each Top Hat question you answer in class you will get points for the correct answer. But you also get points for any answer (participation). For example, a question answered in class gives 80% for getting it correct and 20% for any answer.
- For each lecture unit, Top Hat points will count for a quarter of your unit lecture point total. For each lecture unit section, the exam will count 15% and Top Hat as 5% (in other words, 15% of your course grade is based on your Top Hat daily quiz points).
- Answers to review questions will be made accessible ‘for review’ on Top Hat and serve as excellent practice when studying for exams.
- Some Top Hat ‘participation only’ questions count for bonus points.

Course technology and assistance

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/hours>, 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

Technology skills specific to this course

- Basic PowerPoint skills for team project

Required equipment

- Computer: current Mac (OS X) or PC (Windows) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- 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.

ES/EEOB/Hist 1911: Climate Change: Mechanisms, Impacts, and Mitigation

An interdisciplinary course offered jointly by the Departments of Earth Science, Evolution, Ecology and Organismal Biology and History

Autumn 2021

Lectures: Tuesday and Thursday 2:20PM - 3:40PM [call #s =21009, 35192, 35275]

Lectures will be conducted on-line, via CarmenZoom. The Zoom Link for the lecture is:
<https://osu.zoom.us/j/97527295927?pwd=YVdLNWNKSjhwNkJtaGFjWjV4L3dPUT09>
Password: EEH1911

Course Description

This course provides a multidisciplinary introduction to the causes of climate change, its consequences for Earth, life, and society, and what we can do about it. This course was developed and will be taught by a team of professors and teaching associates from geoscience, biology, and history. Students will acquire insights from all these disciplines to address the most critical issue of our time. No background in the natural or social sciences is required, other than those described in the Ohio (and most other state) K-12 content standards.

Instructors:

Prof. Michael Bevis, School of Earth Sciences, 275 Mendenhall Lab, bevis.6@osu.edu (247-5071)
Office hours: Thursday 4:00-5:00PM, or by appointment
Zoom Link: <https://osu.zoom.us/j/92081922931?pwd=eTJqTjVQaVpidy9taIRyM243bXVVdz09>
Password: 767588

Prof. John Brooke Email: brooke.10@osu.edu: 273 Dulles Hall 614-292-8757 [Realistically, I will not be at this phone much this semester, but I respond to email quickly, messages here appear on my email]
Office hours: Wednesday 1:00-3:00 or by appointment
Zoom link: <https://osu.zoom.us/j/98667445846?pwd=T1NvT2d6cmLuOVFVTUJKZ3IyS1ppQT09>
Password: 141483

Prof. Jim Hood, Department of Evolution, Ecology and Organismal Biology, 230 Research Center.
hood.211@osu.edu (292-5383) office hours: Tuesday/Thursday 1:00-2:00 (or by appt.)
Zoom link: <https://osu.zoom.us/j/92724703574?pwd=SGpQWC9aYUJ5MThWVG82VGF2RFBhUT09>
Password: EEH1911

All recitations meet in Mendenhall Lab, 163 <[map](#)>

Recitation Staff:

Teresa Avila (Earth Science) avila.75@osu.edu

Recitations:

We 12:40PM - 1:35PM 21106 35198 35281

We 1:50PM - 2:45PM 21108 35200 35283

Office hours: Wednesdays, 3:00-4:00, and by appointment

Zoom link: <https://osu.zoom.us/j/8515487775?pwd=NTM1bVhWVXFrDJKUytUZjNaEQvdz09>

password: carbonate

Ives Hartman, (History) Dulles Hall hartman.637@buckeyemail.osu.edu

Recitations:

Mo 9:10AM - 10:05AM 21101 35193 35276

Mo 10:20AM - 11:15AM 21103 35195 35278

Office hours: Tuesday, 12:00-2:00PM, or by appointment

Zoom link: <https://osu.zoom.us/j/95326548081?pwd=TGNxTk1zOVVYRE9JbzI0NmJ4MWFhdz09>

Password: 028875

Ben Kurtz (Earth Science) kurtz.359@osu.edu

Recitations:

Mo 9:10AM-10:05AM 21101 35193 35276

We 9:10AM-10:05AM 21102 35194 35277

Office hours: Wednesdays, 2:00-3:00p, and by appointment

Zoom link: <https://osu.zoom.us/j/8103863431?pwd=TnJsWE9BYkRqd2dpNjOvRys3TWJhZz09>

Passcode: 578080

Imran Razik (EEOB) Aronoff Laboratory razik.2@osu.edu

Recitations:

Mo 12:40PM - 1:35PM 21105 35197 35280

Mo 1:50PM - 2:45PM 21107 35198 35282

Office hours: Monday 3:00-4:00PM, and by appointment

Zoom link: <https://osu.zoom.us/j/95330723273?pwd=MCt6SmZqVFVJR216amZsNWZVek5vZz09>;

password: 911699

Some important information in this synchronous on-line course:

Given the evolving Covid-19 situation in Columbus, the lectures will offered “synchronous-on-line” – meaning that they will be live on Zoom at the scheduled times. The Zoom link is:

<https://osu.zoom.us/meeting/tJMode6qpz4jGNOkwZ4XNyKSKGfK->

[jVck7iT/ics?icsToken=98tyKuCvqzktGN2QuRuARowEGYjoKOrxmCVEjY1yIwjfVxh9evjFHeVOGf91](https://osu.zoom.us/j/95330723273?pwd=MCt6SmZqVFVJR216amZsNWZVek5vZz09)

[Jtvb](#) Password: EEH1911

Lectures will have a Top-Hat component, which will determine your participation grade, so you will want “attend” the lecture at the scheduled time. Recitations will be in person, all in Mendenhall Lab 163, a large room. They will have graded components that will require participation at the scheduled time. Please see details below, and the “Course technology” section on the last page.

We assume that you will have a lot of other online teaching, and obviously this will require that you to have a healthy, functioning laptop and or other internet capable device. We hope that you have a laptop with a functioning camera and microphone. I would take the time now to test your systems so there are no issues in the fall. Check here for additional resources on staying connected <https://keeplearning.osu.edu/learning-tools/internet-access> (Links to an external site.)

We hope that you have a safe and productive semester. Getting or transmitting Covid-19 is really no joke. We are all in this thing together! The university asks that we all review the health guidelines at <https://safeandhealthy.osu.edu/> (Links to an external site.) and requires that we all take the Buckeyes Together pledge. Please attend to your mental health as well, and review resources and strategies here <https://safeandhealthy.osu.edu/mental-health-wellness>.

We will be making announcements on Carmen, and copying these announcements into emails to the class. Please regularly check your Carmen page for announcements. As per university policy, all office hours will be held via Zoom.

Please put the course number [1911] in any emails that you send to us. We get a lot of messages, and we teach more than one course!

Grading: Grading for this course is calculated on a 1000 point scale, corresponding to 100% of your grade:

Lectures: 60% [600 points].

Top Hat lecture questions: 5% [30 points *4] = 120

Each unit exam: 15% [120 points* 4] = 480

Recitation Participation: 20 % [200 points]. Grades will be assigned to your participation in both “Pre-reports” (individual comments posted to Carmen before recitation); and “Group reports” (commentary posted to Carmen by your assigned Group, at the end of recitation); [there are 12 recitations on the current syllabus]

Pre-Reports: 10 points each

Group Reports: 6-7 points each [rising after Sept. 30]

Newspaper Articles and Comments: 6% (2% each) [60 points]

Paper or PowerPoint Prospectus: 2% [20 points]

Final Paper or PowerPoint: 12% [120 points]

TOTAL: 100% [1000 points]

Major assignment due date overview:

Unit quiz, Section 1: Mechanisms Sept. 20 [Monday]

Unit quiz, Section 2: Economies, energy Oct. 11 [Monday]

Paper or PowerPoint Prospectus due in recitation Nov. 1, 3

Unit quiz, Section 3: Impacts Nov. 19 [Friday]

Unit quiz, Section 4: Mitigation Dec. 8 [Thursday]

Papers, by students who have chosen this option, are due on Carmen, Friday, Dec. 10, 400PM

PowerPoint project option is due on Carmen Thursday Dec. 9, by 6:00PM

PowerPoint presentations will take place on Zoom on Friday Dec. 10, 4:00-6:00PM. [Note: this is our exam day and time, so there should be minimal conflicts.]

Lecture questions and unit-quizzes

There will be short sets of questions during the synchronous Zoom lectures, delivered via Top-Hat. To accommodate the unique uncertainty associated with this semester, we will drop the lowest day’s score on these in-lecture questions.

There will be four unit-exams on Sept. 20, Oct. 11, and Nov. 19, Dec. 8, conducted online. You will have eighty minutes to complete each exam during the regular class meeting time. If you are unable to take the exam during the regular class time, you will need to make alternative arrangements by 5pm on the day before the exam (Sept 19, Oct 10, Nov. 19, Dec 8). Unit-exam questions will focus on material covered in current lectures and readings, however some key material will be cumulative.

Recitation Participation

The Recitations will be conducted in person in Mendenhall Labs, Room 163, at the scheduled times. We expect our students to attend and participate in all scheduled recitation sections, having read all assigned readings for that week, and to participate regularly in the discussions taking place in these recitations. Recitations will be divided into four-person pods, which will work together throughout the course. To

accommodate the unique uncertainty associated with this semester, we will drop the lowest recitation day's participation score at the end of the semester.

Newspaper Articles and Discussion

Elements of several of the earlier recitation sections will be built around the formation and discussion of electronic news article "scrapbooks." Students are expected to contribute three articles to their recitation-pod scrapbook. Submissions should be accompanied by a paragraph explaining the content, why you found the article particularly important or compelling, and how it relates to the course. Regular submission of appropriate articles from major respectable news sources will earn full credit for this portion of the course grade. Please see the instructions on Carmen for further details.

Final project:

There will be **two options for a final project**: a group-developed PowerPoint presentation or a short individual research paper. Building from the course material, the newspaper article collections developed in the recitation groups, and your own research, papers or PowerPoints will explore a particular dimension of the wider problem of climate change past, present, and future, appropriately informed by the geophysics, biology, and/or history of climate change.

Option A: PowerPoint Project.

ES 1911 PowerPoint Projects option offer you the opportunity to work in small groups, exploring a particular dimension of the wider problem of climate change past, present, and future, appropriately informed by the geophysics, biology, and/or history of climate change. Your PowerPoint group will be drawn typically from your recitation pod. The PowerPoint groups will distribute the research and production responsibilities equitably, and specify them in the Poster Prospectus, which are due for review in recitation on Nov. 1, 3. The project involves two required steps: (1) a prospectus; (2) a delivered PowerPoint, turned in on Carmen on Dec. 9 and presented on Zoom by all members of the group to a team of instructors on Dec. 10. Part of the grading will be based on the effectiveness of the PowerPoint group teamwork. Further information can be found in "Research Guidelines" the "PowerPoint Instructions" posted to the course Carmen site.

Option B: Individual essay.

Alternatively, you may write an essay of ~1,200 words with citations, exploring a particular dimension of the wider problem of climate change past, present, and future, appropriately informed by the geophysics, biology, and/or history of climate change. Your papers should be informed by the course material, the newspaper article collections developed in the recitation pods, and your own research. Your Paper Prospectus is due for review in recitation on Nov. 1, 3. Your paper will be due on December 10. Further information can be found in "Research Guidelines" the "Essay Instructions" posted to the course Carmen site.

Numeric/letter grade scale: when we grade on a numerical scale, these are the conversions to letter grades. Bear in mind that "A+" is not an official grade at OSU.

A+ 97-100	C+ 77-79.9
A 93-96.9	C 73-76.9
A- 90-92.9	C- 70-72.9
B+ 87-89.9	D 60-69.9
B 83-86.9	E 0-59.9
B- 80-82.9	

Faculty feedback and response time

(Remember that you can call **614-688-HELP** at any time if you have a technical problem with Carmen. Please the last page for “Course Technology”.)

- **Grading and feedback:** For major assignments, you can generally expect feedback within **10 days**. Recitation grading generally will be available in at least 48 hours
- **Email:** We will reply to emails within **24 hours on days when class is in session at the university**.

Course Policies

Attendance:

The lectures will be conducted on Zoom, with Top-Hat mini-quizzes, open mike sessions, and question periods initiated by TA monitored chat functions. Participation in these activities, especially the Top-Hat mini-quizzes, is calculated into your lecture attendance grade. If you will be missing the scheduled lecture and have a valid excuse (medical, COVID19-related, or compassionate reasons only), please inform your TA, and you will have access to a Carmen quiz following viewing the recorded lecture you will be provided with a makeup assignment for the participation points and mini-quizzes. While we appreciate that life may conflict with lecture every once in a while, particularly during these turbulent and difficult times, double-booking another regularly scheduled event (e.g., a different class, exam, or work) with lecture will not be excused.

The recitations in this course employs structured, cooperative groups for many graded activities; absence of a group member can harm group members attending recitation. Therefore, all students should complete the course readings and other activities and attend every lecture and their scheduled recitations. Class meetings will usually include in-class assignments and quizzes, so missing class will lower your grade.

You should attend the recitation section in which you are enrolled. If you miss or know you will miss your assigned recitation section (e.g. for a scheduled health care appointment), and can attend an earlier or later section, work with your TA to arrange attending the other section. Note, this will disrupt interactions with your cooperative group, and we will try to minimize how often it occurs.

Submitting Work: Please submit all assignments in a MS Word compatible format (.doc, .docx, .txt., or .rtf) online on Carmen. Work will not be considered complete until it is has been uploaded in a readable format. If we cannot read it, we cannot grade it or even comment on it.

Late Work: Late assignments will have 10% deducted for every day late, weekends included. The only exceptions will be extensions granted ahead of time or serious documented emergencies.

Statement on Plagiarism and Misconduct: OSU has a strict code of academic misconduct that requires us to report any and all cases of suspected misconduct (e.g. plagiarism in written assignments, etc.) to the OSU Committee on Academic Misconduct for adjudication. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>. We adhere to this policy. You should understand the nature and consequences of plagiarism (and of anti-plagiarism sites like www.turnitin.com). The OSU Writing Center: <http://cstw.osu.edu> provides more information on proper citing of your sources of information.

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Grade Grievances and Other Academic Complaints: Students with complaints about courses, grades, and related matters should first bring the matter to the instructor. The student may appeal further to the College of Arts and Sciences. For additional information see the Office of Undergraduate Education (<https://ugeducation.osu.edu/complaint-grievance-and-appeal-procedures/>) and the Office of Student Life: Student Advocacy Center (<https://advocacy.osu.edu/academic-enrollment/grade-grievance/>).

Dept. of History Grievance options: If the student and the instructor cannot arrive at a mutually agreeable settlement, the student may take the complaint to the vice chair of the department, David Brakke (.2), who will investigate the matter fully and attempt to resolve it. If the vice chair is involved, the student should contact the department chair, Scott Levi (.18). The student may appeal further to the College of Arts and Sciences. Any student with a grievance may seek advice from the department’s grievance resource officer, Birgitte Soland (.1).

University and course policies:

Covid-19 instructions: We take this opportunity to remind you of the Ohio State Health and safety requirements. The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university’s [request process](#), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let us know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with your assigned TA as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Statement on Disability Services: 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 Dr. Hood know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with Dr. Hood as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Statement of 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. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you

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can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling [614-292-5766](tel:6142925766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:6142925766) and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Statement on Diversity: The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential.

Statement on Sexual Misconduct/Relationship Violence: Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

Statement on Counseling Services: Should you find yourself experiencing personal difficulties, whether related to class or not, please know that you have access to confidential services provided by the University. Details can be found here <https://safeandhealthy.osu.edu/mental-health-wellness>.

Statement on Accessibility: 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. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Land Acknowledgement: The Ohio State University acknowledge that its campuses have long served as sites of meeting and exchange for Indigenous peoples, including those in historical times known as the Shawnee, Miami, Wyandotte, Delaware, and the People of Fort Ancient, Hopewell, and Adena cultures, also known as the earthworks builders, as well as other tribal nations of the region. The Ohio State University honors and respects the diverse Indigenous peoples connected to this land in which we gather.

This course may fulfill any one (only) of the following: GE Historical Study, GE Natural Science: Biological Science, GE Natural Science: Physical Science.

Physical and Life Science Learning Goals:

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

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Rationale for Meeting Physical and Life Science Learning Goals:

1. We will examine the basic facts, principles and theories of climate, climate change and climate change impacts, both from physical and biological perspectives. This includes a study of scientific methodology.
2. Much of the scientific content of this course will be organized around the history of the related observational and theoretical advances, and the progressive development of the modern understanding and the predictive power of climate change science.
3. Climate change is largely driven by human practices tied to our energy technologies and industries and our need for resources such as food, space and raw materials. Scientific investigation has helped diagnose the problem, and identify solutions: these solutions will involve the development and large-scale deployment of new technologies.
4. Climate change is one of the most important and critical issues facing the contemporary world. It exemplifies the ‘unintended consequences’ of science and technology, as they have been developed and deployed in the global economy. The spatially and socially uneven impacts of global change also raise important moral, legal, social and political issues. Science and technology have contributed to climate change but can also be part of the solution.

History Learning Goals:

History courses develop students’ knowledge of how past events influence today’s society and help them understand how humans view themselves.

1. Students acquire a perspective on history and an understanding of the factors that shape human activity.
2. Students display knowledge about the origins and nature of contemporary issues and develop a foundation for future comparative understanding.
3. Students think, speak, and write critically about primary and secondary historical sources by examining diverse interpretations of past events and ideas in their historical contexts.

Rationale for Meeting History Learning Goals:

1. Students will explore past climate changes and how they influenced human economies, societies, and cultures.
2. Students will learn about the technological, business, and political developments that led to contemporary global warming and have obstructed political responses.
3. Students will read and discuss original historical accounts documenting climatic changes and impacts.

Readings

All required readings, or links to them, will be posted to Carmen. There is no *required* textbook for the course.

Note: Syllabus is subject to limited change with advanced notice. There will be no change in the length and number of assignments.

Weekly Schedule:

Week 1

August 24: Introduction to the course: questions, structure, and goals [all]

*No recitations this week

SECTION 1: MECHANISMS: CLIMATE SYSTEMS & GREENHOUSE GAS CYCLES.

August 26: Weather and Climate [MB]

Week 2

Recitations Aug. 30, Sept. 1: How does the IPCC arrive at recommendations about climate change and what are its most important recommendations?

August 31: Solar radiation and the Greenhouse Effect [MB]

September 2: Atmospheric and Oceanic Circulation [MB]

Week 3

Recitations: NONE – Labor Day on Monday. Sept. 6

September 7: The Discovery of Global Warming [MB]

September 9: Paleoclimatology and the Fragility of the Climate System [MB]

Week 4

Recitations Sept. 13, 15: Understanding the Global Carbon Cycle

September 14: Anthropogenic and natural sources of global warming gasses [JH]

September 16: ½ GHG cont. [JH]; ½ The climate system can be save! [MB]

September 20 Monday SECTION 1 QUIZ – AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-quiz description on p. 3

SECTION 2: ECONOMIES, ENERGY AND CLIMATE: AN HISTORICAL OVERVIEW

Week 5

Recitations Sept. 20, 22: Poster and essay planning: Discuss the key themes in the ES1911 student newspaper posts.

September 21: Climate, energy, and humanity: evolutionary origins through the origins of agriculture [JB]

September 23: Climate and Crisis: Agriculture, Disease, and Warfare in the [Holocene] Ancient and medieval worlds [JB]

Week 6

Recitations Sept. 27, 29: Climate and premodern energy transitions

September 28: The Little Ice Age and the First Globalization: the opening to modernity [JB]

September 30: Energy and Economies: The First Industrial Revolution [JB]

Week 7

Recitations Oct. 4, 6: What have been the key features of the energy transitions since 1800?

October 5: Energy and Economies: The Second Industrial Revolution [JB]

October 7: Energy and greenhouse emissions [JB]

Monday October 11: SECTION 2 QUIZ – AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-quiz description on p. 3

SECTION 3: MODERN CLIMATE CHANGE IMPACTS

Week 8

Recitations: NONE – fall Break [Note: Sect. II Quiz on Monday, Oct. 11]

October 12: Emission, economies, and climate change impacts through time; Some thoughts on population growth [JB]

October 14: NO CLASS – Fall Break

Week 9

Recitations Oct. 18, 20: Poster and essay planning: preliminary research plan

October 19: Intensification of the Hydrological Cycle [MB]

October 21: Ice loss, Water Resources and Seal Level Rise [MB]

Week 10

Recitations Oct. 25, 27: How much corn and how many cows can you raise on the oval?

October 26: Background: value of biodiversity & ecosystem services [JH]

October 28: Impact of climate change on environmental suitability for nature & people [JH]

Week 11

Recitations Nov. 1, 3: What is your ecological footprint? **Your PowerPoint or paper prospectus is due in recitation**

November 2: Impact of extreme events: heat waves, fires, and floods [JH]

November 4: Effect on biodiversity: extinctions and changes in biogeography and biological timing [JH]

Week 12

Recitations Nov. 8, 10: What is the impact of climate change on agriculture in the United States?

November 9: Boreal Forest: impacts and feedbacks [JH]

November 11: NO CLASS – Veterans Day

Week 13

Recitations Nov. 15, 17: How do citizens and the policy-makers they elect understand (or not) the science on which to base today's public policies

November 16: Agriculture, fisheries, and food production systems [JH]

Friday: 19 Nov: SECTION 3 QUIZ – AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-quiz description on p. 3

SECTION 4: MITIGATING CLIMATE CHANGE

November 18: Conservation planning for persistence, resistance, and resilience [JH]

Week 14

November 23: Renewable Energy, Energy Storage, and Energy Efficiency, Day 1 [MB]

Recitations: NONE Thanksgiving break starts Nov. 24

November 25: NO CLASS Thanksgiving break

Week 15

Recitations Nov. 29, Dec. 1: What is required to drive the next energy transition?

November 30: Renewable Energy, Energy Storage, and Energy Efficiency, Day 2 [MB]

December 2: Global Climate Change Politics: Fears, Denial, and Future Scenarios [JB]

Week 16

December 7: Can our Climate System be 'Saved'? [MB]

No recitations this week

December 8: Short Final quiz on-line: **AVAILABLE ALL DAY; OPEN FOR EIGHTY MINUTES, see unit-quiz description on p. 3**

Final Assignments:

Option A:

PowerPoint project option is due on Carmen Thursday, Dec 9, by 6:00PM.
PowerPoint presentations will take place on Zoom on Friday December 10, 4:00-6:00PM. **[Note: this is our exam day and time, so there should be minimal conflicts.]**

Option B:

Papers, by students who have chosen this option, are due on Carmen, Friday December 10, 4:00PM

* We agree with the report of the Special Commission of the National Academy of Sciences that has stated, “Any education that focuses predominantly on the detailed products of scientific labor — the facts of science — without developing an understanding of how those facts were established, or that ignores the many important applications of science in the world, misrepresents science and marginalizes the importance of engineering.” (doi.org/10.17226/13165.)

TOP HAT POLICIES AND USAGE

- Access by smartphone or computer web browser. Texting option available as well.
- Sign for a Top Hat account at <https://app.tophat.com/login> (do NOT select the SSO bypass option) using your OSU username/password and there is no cost to you.
- Once you have an account, you will be able to enter the join code #984971 or search for the course “1911 Fall 2020 Climate Change” to be enrolled.
- It is useful to browse the student support pages at <https://support.tophat.com/s/categoryhome/Student> and if you have questions you are encouraged to call Top Hat or email at support@tophat.com.
- Using Top Hat, points are awarded for questions answered correctly in class –in other words, we have daily ‘quizzes’.
- There will also be bonus points for participation in class using Top Hat (some questions are opinion or thought questions).
- Accommodation will be made for students with disabilities.

TOP HAT POLICIES AND USAGE: GRADING

- Review questions will be asked during lecture based on material from the previous class (in-class ‘quizzes’). There will be about 3 questions per lecture on average, but anywhere from 1-10 is possible.
- For each Top Hat question you answer in class you will get points for the correct answer. But you also get points for any answer (participation). For example, a question answered in class gives 80% for getting it correct and 20% for any answer.
- For each lecture unit, Top Hat points will count for a quarter of your unit lecture point total. For each lecture unit section, the exam will count 15% and Top Hat as 5% (in other words, 15% of your course grade is based on your Top Hat daily quiz points).
- Answers to review questions will be made accessible ‘for review’ on Top Hat and serve as excellent practice when studying for exams.
- Some Top Hat ‘participation only’ questions count for bonus points.

Course technology and assistance

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/hours>, 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
- Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](#).
- Basic understanding of Zoom
- Basic understanding of word-processing

Technology skills specific to this course

- Basic PowerPoint skills for team project

Required equipment

- Computer: current Mac (OS X) or PC (Windows) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- 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.