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?)

Request to have the course count as a Citizenship and Lived Environments Theme course under new GE.

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

The topic lends itself very well to both Themes in the new GE.

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 requrest contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Earth Sciences
Fiscal Unit/Academic Org	School of Earth Sciences - D0656
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	2206
Course Title	Principles of Oceanography
Transcript Abbreviation	Princ Oceanography
Course Description	Introduction to the four basic disciplines of oceanography: geological, chemical, physical, and biological. Relevance of oceanography in contemporary issues.
Previous Value	*Introduction to the four basic disciplines of oceanography: geological, chemical, physical, and biological. Relevance of oceanography in contemporary issues. Autumn 2021 and after: Add EarthSc 1200 for Physical Science GE lab credit.*
Semester Credit Hours/Units	Fixed: 3

Offering Information

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

Prerequisites and Exclusions

Prerequisites/Corequisites	
Exclusions	Not open to students with credit for 2206S.
Electronically Enforced	Yes

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	40.0607
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

General Education course:

Physical Science; Citizenship for a Diverse and Just World; Lived Environments

The course is an elective (for this or other units) or is a service course for other units

Previous Value

General Education course:

Physical Science

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Study of the Earth's oceans and connection to Earth's life, climate, and sustainabillity

Content Topic List

- Tools and techniques of oceanography
- Marine geography
- Plate tectonics
- Chemistry of seawater
- Ocean-atmosphere interaction
- Surface circulation
- Deep circulation
- Waves and coastal processes
- Conditions of life in the oceans
- Marine productivity and biology
- Marine sediments and paleoceanography
- Tides

Sought Concurrence No

Attachments

- EARTHSC2206 - syllabus.docx: Revised Syllabus for new GE

  (Syllabus. Owner: Griffith,Elizabeth M)

- submission-doc-citizenship_EARTHSC-2206.pdf: Citizenship application doc

  (Other Supporting Documentation. Owner: Griffith,Elizabeth M)

- submission-lived-environments_EARTHSC-2206.pdf: Lived Environments application doc

  (Other Supporting Documentation. Owner: Griffith,Elizabeth M)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Griffith,Elizabeth M	03/08/2022 09:00 AM	Submitted for Approval
Approved	Griffith,Elizabeth M	03/08/2022 09:00 AM	Unit Approval
Pending Approval	Vankeerbergen,Bernadette Chantal	03/08/2022 09:00 AM	College Approval

EARTHSC 2206 Principles of Oceanography

Class Lecture: Tuesday and Thursdays 12:45-2:05pm (3 credits, in person)
Class Number: ####
Class Location: TBD
Instructor: TBD
Office/Student Hours: TBD

Course Catalog Description: "Introduction to the four basic disciplines of oceanography: geological, chemical, physical, and biological. Relevance of oceanography in contemporary issues."

Required Textbook: Essentials of Oceanography (8th Ed). By T. Garrison & R. Ellis. Any edition is equally fine. Copies of older editions of the textbook will be on reserve in the Orton library.

Course overview and goals: This course is constructed such that all students (irrespective of your major area of study) can learn about the oceans. When a person is literate in how the oceans impact humanity on a daily basis, they are given the tools to better protect the ocean. All citizens—whether they reside in the country's heartland or mountains, or along the coast affect and are affected by the ocean (NOAA). Our planet needs informed citizens to act responsibly to ensure the well-being of future generations.

The specific goals of this course are that students will (1) demonstrate a basic knowledge of geological, chemical, physical and biological oceanography and relationships between these systems, (2) explore relationships between the global ocean and humans, (3) understand and evaluate current ocean topics in the media, and (4) gain an appreciation for the global ocean and the Blue Planet we live on. Students will be encouraged to take informed action as citizens of the planet responsible to future generations.

The course will follow the concepts presented in the textbook, enhance those concepts with additional information and personal experiences, and provide a framework for discussion about the larger implications and applications of those concepts.

Specific learning outcomes:

1. Students will recognize and demonstrate the interdisciplinary nature of oceanography using conceptual models of ocean circulation and its influence on life in the oceans and climate.
2. Students will understand and apply the scientific method to evaluate the theory of plate tectonics and to explain the formation of seafloor features.
3. Students will recall properties of seawater and its influence on climate at multiple scales (e.g., regional vs. global) in the past, present, and future.
4. Students will be able to describe the processes of nutrient cycling in the oceans and predict the areas of the ocean with greatest productivity and marine fisheries.

5. Students will evaluate the impact of humans on the oceans and sustainability of marine resources.
6. Students will evaluate the effect on an ecosystem of removing (hunting/overfishing) one member and explore how to manage marine resources wisely for the benefit of humanity.
7. Students will articulate scientific arguments for why the oceans matter and its importance to the Earth's environment and to humans.
8. Students will discuss the importance of oceanography in global initiatives and political decisions for the present and future.
9. Students with identify the consequences of a rise in sea-level on the coastal zone and society and possible mitigation and adaptation strategies.

Students starting at Ohio State in Autumn 2022 and beyond: EARTHSC 2206 will count as any one (and only one) three-credit course in the following new General Education (GE) Themes: **Citizenship for a Diverse and Just World** or **Lived Environments.**

As part of the **Citizenship for a Diverse and Just World** Theme of the General Education curriculum, this course is designed to prepare students to be able to do the following:

GOAL 1: Successful students will explore and analyze a range of perspectives on local, national, or global citizenship, and apply the knowledge, skills, and dispositions that constitute citizenship.

1.1 Describe and analyze a range of perspectives on what constitutes citizenship and how it differs across political, cultural, national, global, and/or historical communities.

1.2 Identify, reflect on, and apply the knowledge, skills and dispositions required for intercultural competence as a global citizen.

GOAL 2: Successful students will 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.

2.1 Examine, critique, and evaluate various expressions and implications of diversity, equity, inclusion, and explore a variety of lived experiences.

2.2 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.

We will achieve these goals by learning how "the ocean plays a role in our life in some way every day" (NOAA), and how all citizens affect and are affected by the sea. Specifically, we will learn focus on the challenges of climate change, sea level rise, marine pollution, and overfishing. Our planet needs informed citizens to act responsibly to ensure the well-being of future generations on our Blue Planet. Despite the importance of the ocean, however, the United States' general public knows very little about the global ocean. This course will improve your ocean literacy and awareness of oceanography in contemporary issues.

As part of the **Lived Environments** Theme of the General Education curriculum, this course is designed to prepare students to be able to do the following:

GOAL 1: Successful students will explore a range of perspectives on the interactions and impacts between humans and one or more types of environment (e.g., agricultural, built, cultural, economic, intellectual, natural) in which humans live.

1.1 Engage with the complexity and uncertainty of human-environment interactions.
1.2 Describe examples of human interaction with and impact on environmental change and transformation over time and across space.

GOAL 2: Successful students will analyze a variety of perceptions, representations and/or discourses about environments and humans within them.

2.1 Analyze how humans' interactions with their environments shape or have shaped attitudes, beliefs, values and behaviors.
2.2 Describe how humans perceive and represent the environment with which they interact.
2.3 Analyze and critique conventions, theories and ideologies that influence discourse around environments.

We will achieve these goals by learning fundamental oceanography concepts and exploring the relationship and interconnectedness between the marine "lived" environment and humans. The ocean impacts our lives daily by influencing our weather and climate, providing much of the oxygen we breathe and for many, the food they eat. Ocean currents also connect humans around the Earth and ocean life. This course will help you gain an appreciation for the global ocean and the Blue Planet we live on.

Grading information:

Final Grade based on:

- Exam 1 – geological oceanography 20%
- Exam 2 – chemical oceanography 20%
- Exam 3 – physical oceanography 20%
- Exam 4 – biological oceanography 20%
- Ocean Science Literacy homework 20%

Grading scale: 100-93% **A**; 92-90% **A-**; 89-87% **B+**; 86-83% **B**; 82-80% **B-**; 79-77% **C+**; 76-73% **C**; 72-70% **C-**; 69-67% **D+**; 66-60% **D**; <60% **E**

Exams: There will be three exams during the semester. The fourth exam will be scheduled during final exam week. The exams are not cumulative. Exam questions will only be drawn from materials and discussions presented in class. Exam questions can cover any material covered during lectures including calculations, graphs, tables, maps, definitions, animations, movies, etc. Any of the following type of questions may be given on an exam: multiple choice, fill in the

blank, short answer, true or false. For example, you might be asked to plot a graph of temperature and salinity across depth in the ocean and describe what it means. Exam Q&A review sessions will be held online using the Carmen discussion group. Please bring the following items to exams: eraser, pencil and your BuckID. You are responsible for attending the midterm and final exams on the scheduled date and time. Make-up exams will be granted only in some cases*. Make-up exams may be given as oral exams. The final exam date and time are set by the university. If you miss the final for any reason, you must petition for a make-up exam through the university. Please see me immediately regarding any extenuating circumstances that pertain to any exams.

TIPS

Participation: Regularly attending classes, asking questions in class, participating in class/lab discussions is critical to your learning. You learn by reading the information, hearing it, writing about it, and talking about it. The more of these components you exercise in this course, the easier it will be for you to understand and retain the information.

Bonus points: Random attendance might be taken during the quarter to get an idea of who is regularly attending class. Up to 1 bonus points may be given to those attending lectures (that is a full point added to your final grade). The bonus point days will not be announced in advanced. Oceanography song contest will be held on the last day of class. All lyrics must be about oceanography. The music may be original or existing (i.e., new words to a song on Tiktok). Poems that are song length are also eligible. One bonus point will be given to each contestant, and 2 bonus points to the winning song's solo or team members. Songs can be from an individual or by teams of up to a maximum of 5 people. The song must be submitted on a thumb drive as a video or audio file, or can be performed in class. All songs will be judged by the class to determine the winner.

Other tips: Be considerate of your classmates by arriving on time, turning off your cell phone or any other noise-making device before entering the classroom and by refraining from having discussions with your friends during lectures. Tardiness, whispering, and technological devices can be extremely disruptive.

Course Schedule. *See table on last couple pages*

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 6-9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Statement on academic misconduct: 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/.

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 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.

Statement on 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. 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 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 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 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. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Statement on religious holidays: The University recognizes/observes holidays as listed on http://controller.osu.edu/pay/pay-holidays.shtm If you observe any other religious holidays, please make special arrangements *in person with the instructor within the first two weeks of class.*

Course Schedule:

Week	Chapter Title/Topic	Text Reading (Chapters)
Week 1	Introduction/Overview/Current topics Oceanography as an interdisciplinary science	1
Week 2	Plate Tectonics and the Ocean Floor Marine Provinces	2
Week 3	Ocean sediments Reflection Seismology ***Ocean science literacy homework #1 due***	3
Week 4	**EXAM 1** (Tuesday) Water and Seawater: properties, dissolved gasses	4
Week 5	Water and Seawater: pH and carbonate system Sailing the seas – wind driven ocean circulation	5
Week 6	Sea-ice & density-driven ocean circulation Ocean's influence on climate ***Ocean science literacy homework #2 due***	6
Week 7	**EXAM 2** (Tuesday) Waves and Tsunamis	7
Week 8	Tides Coast: Beaches and Shoreline Processes	7 8
Week 9	Life in a greenhouse & climate change Sea level rise, Paleoceanography ***Ocean science literacy homework #3 due***	11, IPCC
Week 10	**EXAM 3** (Tuesday) Marine Life and the Marine Environment	9
Week 11	Biological Productivity and Energy Transfer Animals of the Pelagic Environment	10
Week 12	Nekton Coral Reefs	10
Week 13	Animals of the Benthic Environment Fisheries	11
Week 14	Marine Pollution & Oceanography song contest (Thursday) ***Ocean science literacy homework #4 due***	11
Finals week	**EXAM 4**	

* Additional reading is encouraged to supplement foundational concepts focused on in mandatory reading. Additional resources are encouraged for researching and preparing educational activity for the Service-Learning project as well.

Careers in oceanography offer the possibility of learning more about and exploring our oceans and the satisfaction of making meaningful contributions toward understanding our planet and protecting and preserving our marine resources. https://www.marineinsight.com/careers-2/a-list-of-unique-and-interesting-marine-careers/

https://www.noaa.gov/work-with-us

Careers in geosciences can offer a wide variety of opportunities to better understand and protect and preserve our natural resources, environment and community. https://www.americangeosciences.org/workforce/career-resources

Consider taking additional classes in the School of Earth Sciences and explore opportunities here at Ohio State. Please feel free to talk with the Instructor or any faculty or students in the School of Earth Sciences for more information. https://earthsciences.osu.edu/

Student Information

1. Name: _____

2. Year of study: _____

3. Major/Field of Study: _____

4. Do you have any background in Oceanography? Y N (circle one)

If yes, describe:_____

_____

5. Why are you taking this class? _____

_____

6. What do you hope to learn from this class? _____

_____

7. What are your career aspirations? _____

_____

8. What is your favorite thing to do in your spare time? _____

_____

GE THEME COURSES

Overview

Courses that are accepted into the General Education (GE) Themes must meet two sets of Expected Learning Outcomes (ELOs): those common for all GE Themes and one set specific to the content of the Theme. This form begins with the criteria common to all themes and has expandable sections relating to each specific theme.

A course may be accepted into more than one Theme if the ELOs for each theme are met. Courses seeing approval for multiple Themes will complete a submission document for each theme. Courses seeking approval as a 4-credit, Integrative Practices course need to complete a similar submission form for the chosen practice. It may be helpful to consult your Director of Undergraduate Studies or appropriate support staff person as you develop and submit your course.

Please enter text in the boxes to describe how your class will meet the ELOs of the Theme to which it applies. Please use language that is clear and concise and that colleagues outside of your discipline will be able to follow. You are encouraged to refer specifically to the syllabus submitted for the course, since the reviewers will also have that document Because this document will be used in the course review and approval process, you should be *as specific as possible*, listing concrete activities, specific theories, names of scholars, titles of textbooks etc.

Course subject & number

EARTHSC 2206

General Expectations of All Themes

GOAL 1: Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.

Please briefly identify the ways in which this course represents an advanced study of the focal theme. In this context, "advanced" refers to courses that are e.g., synthetic, rely on research or cutting-edge findings, or deeply engage with the subject matter, among other possibilities. *(50-500 words)*

In this course, students recognize and demonstrate the interdisciplinary nature of oceanography by learning how scientists make measurements, study and explore the ocean or marine "lived" environment – and the importance of oceanography in global initiatives and political decisions for the present and future (e.g., climate change, global sea level rise). The ocean covers more than 2/3 of the Blue Planet that we live on. Through readings (textbook, IPCC reports), in-class lectures and discussions, and the ocean literacy homeworks, students explore relationships between the global ocean and humans, and gain an appreciation for the global ocean and the planet we inhabit, and how to take informed action as citizens of the planet responsible to future generations (living on this shared planet). These activities constitute a higher level of analysis than a course whose goals are to introduce similar ideas to students so that they can recall them on an exam. Students work with data and advanced concepts in class while completing their ocean literacy homework. The importance of fact-based knowledge for responsible citizens to make decisions at multiple levels in their lives (individual, community, and policy) is emphasized in class discussions and ocean literacy homeworks.

Course subject & number EARTHSC 2206

ELO 1.1 Engage in critical and logical thinking about the topic or idea of the theme. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

There are many ways that this course provides opportunities for the students to engage in critical and logical thinking about citizenship. An important topic is climate change, and 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 discuss 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. They also consider the human dimension of decision making about mitigation strategies and alternative strategies of drawing energy from the oceans (e.g., tides, wind, ocean thermal energy conversion).

ELO 1.2 Engage in an advanced, in-depth, scholarly exploration of the topic or idea of the theme. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

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 climate change requires citizens to think about future generations, and the consequences of their own actions and those of communities, economies, and nations around the world. Students examine temperature and carbon dioxide records over a range of time scales and understand the context of human history and deep time by exploring preserved ice core records spanning the past million years with the historical record of atmospheric temperature measurements over the past century as evidence for climate change and anthropogenic (human-induced) global warming, sea level change and ocean acidification.

Course subject & number EARTHSC 2206

GOAL 2: Successful students will integrate approaches to the theme by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future.

ELO 2.1 Identify, describe, and synthesize approaches or experiences as they apply to the theme. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

Students will draw on past knowledge and unique perspectives from foundation course work in their majors to understand the interdisciplinary field of oceanography – and its impact on their lives (individual, community, and policy) as citizens of this planet and how their decisions can adversely affect the most vulnerable populations to sea level rise or marine food to sustain them, etc. For one of the ocean literacy homeworks, students find current news articles and identify concepts covered in class, and provide a synthesis of how oceanographic data and/or methods are relevant. These short essays will include properly cited references to scholarly literature.

ELO 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. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

This course develops a student's sense of self as a learner by asking them to reflect on ocean literacy and community, and brainstorm scientific questions, issues, opportunities that come to mind in their ocean literacy homework. Students build on prior experiences to identify these questions about oceanography. In-class during the lecture on "life in a greenhouse", students also take a pre-lecture survey on climate change and then reflect on how their responses have changed after the lecture. This activity asks them to assess how their knowledge has changed and to consider how they learn new information. Prior misconceptions on climate change are discussed, as well as their role as a citizen of the Blue Planet.

Course subject & number EARTHSC 2206

Specific Expectations of Courses in Citizenship

GOAL 1: Successful students will explore and analyze a range of perspectives on local, national, or global citizenship, and apply the knowledge, skills, and dispositions that constitute citizenship.

ELO 1.1 Describe and analyze a range of perspectives on what constitutes citizenship and how it differs across political, cultural, national, global, and/or historical communities. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

All citizens—whether they reside in the country's heartland or mountains, or along the coast affect and are affected by the ocean (NOAA). Our planet needs informed citizens to act responsibly to ensure the well-being of future generations. Students will be encouraged to take informed action as citizens of the planet responsible to future generations. In this course students "evaluate the impact of humans on the oceans and sustainability of marine resources". The challenge of managing marine resources is specifically discussed toward the end of the semester during the lecture on fisheries. Students learn about fisheries as a marine resource in lecture (and textbook assigned reading). The collapse of many fisheries throughout the 20th century as a result of scientific failure as well as socioeconomic failure is analyzed and critiqued. The need to move from a local to global view and discourse is presented and discussed. Students are then given time in class to research and decide if wild-caught or farm-raised fish are better for the environment. The class then comes together and debate this question describing and analyzing a range of perspectives – across political, cultural, national, global, and/or historical communities and considering various ideologies that contribute to the environmental discourse

Students also consider the issues of global citizenship and responsibility in the face of climate change, sea level change and ocean acidification. Students consider the consequences of their own actions and those of communities, economies and nations around the world who employ different strategies.

ELO 1.2 Identify, reflect on, and apply the knowledge, skills and dispositions required for intercultural competence as a global citizen. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

Students first recognize the global nature of studying oceanography, and the impact of the global ocean on climate and sustainable marine resources. As citizens of planet Earth with one global ocean, it is critical in this class for students to consider the skills necessary for intercultural competence to be able to communicate across cultures with different circumstances and histories the importance of managing marine fisheries and the impact of fossil fuel economies - which have historically benefited some countries and adversely impacted others. This is reflected on in an ocean literacy homework assignment which asks the students to consider mechanisms and impact of climate change for different economies and consider the roles of governmental action and citizen advocacy in mitigation strategies, including how to achieve a transition to low-emission renewable energy systems.

Course subject & number EARTHSC 2206

GOAL 2: Successful students will 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.

ELO 2.1 Examine, critique, and evaluate various expressions and implications of diversity, equity, inclusion, and explore a variety of lived experiences. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

The politics of the Anthropocene requires that students understand the disproportionate historical impact that the Western economies have had in driving the trajectory of a rapidly warming planet, rising sea level, and extraction of resources from oceans. The disproportionate impact of these changes will affect poorer less developed countries outside the US. Within the United States, this also means understanding the impacts of marine heat waves, hurricanes, diminished marine food and fisheries, and declines in coastal protection from storms and sea level rise due to reef dissolution and reef ecosystem decline. These impacts are disproportionately felt by poorer populations that live in regions impacted by sea level rise and storms as well as those which rely on marine food and fisheries. Around the world, students will gain a better understanding of the emerging and projected global impacts of anthropogenic driven ocean warming and acidification impacts: marine heat waves, coastal protection decline, reduce marine food.

The following topics ask the student to address the issues of global and national environmental justice: pH and carbonate systems, sea ice and ocean circulation, coral reefs, ocean pollution, life in a greenhouse and climate change, and fisheries. In addition, the Ocean Science Literacy homework assignments directly challenge students to evaluate the impact of policy decisions on ocean health and societal impacts.

2.2 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. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

The four Ocean Literacy homework assignments will focus on several of the following topics: impact of sea-level rise, ocean acidification and ocean warming, the potential mining of metallic nodules for strategic minerals needed in a no/low carbon economy, global plastic pollution, and/or the potential collapse of coastal fisheries and how their impacts effect social justice, economic, political, cultural, and/or climate mitigation/adaption issues. After the completion of these writing assignments, the topics will be discussed in class.