

College of Natural Science & Mathematics



Natural Resources and Environment

NRM F111X-701 Introduction to Sustainability Science

Syllabus: Spring, 2024

Instructor information

John Duffy

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Office Hours: By Appointment

Class Information

CRN: 34168

Location of class sessions: Online Synchronous

Sessions: Tuesday & Thursday; 9:45am 11:15am

Credit Hours: 3.00

Feel free to call, text, or email at your convenience. A note on texts and emails - if you do not receive a response in 12 hours, do not hesitate to send a reminder.

Course Description

The field of sustainability science provides a useful framework for understanding and responding to complex environmental problems. This course introduces the theory and principles that form the basis of sustainability science, focusing on feedbacks between society and the environment with an emphasis on environmental and related change in Alaska.

Course Overview

This course serves as an introduction to the world of sustainability science. We will explore the four primary dimensions of sustainability, commonly referred to as the four “E”s: 1) environment/ecology, 2) economy/employment, 3) equity/equality, and 4) education. The course considers several underlying principles related to sustainability and climate challenges, including systems thinking, resilience theory, ecological economics, vulnerability analysis, and adaptive governance. This is an introductory course, yet students are expected to have some basic knowledge and understanding of contemporary sustainability challenges such as climate change, biodiversity loss, pollution, over-fishing, and ecosystem degradation. The class emphasizes principles and practices for sustainable solutions to these challenges.

Student Learning Outcomes/ Course Goals

- Develop an understanding of conceptual frameworks for analyzing and understanding sustainability
- Develop core skills in critical thinking, writing, listening, and oral presentation
- Develop knowledge of tools and methods for analyzing and solving real-world issues related to sustainability
- Apply these principles and methods through various written and/or oral assignments, focusing on solutions to sustainability problems

Learning Objectives

- Familiarity with terms and concepts used in sustainability science
- The ability to identify social, economic, and ecological aspects of sustainability

- Development of critical thinking skills
- Knowledge to integrate social, economic, and ecological aspects of sustainability to create solutions for contemporary issues, with emphasis on environmental change in Alaska

Skills Development

The following skills are important for solving sustainability problems in the world. This course aims to help you develop and hone these skills.

- Read, understand, and interpret readings from a variety of sources, including peer-reviewed literature
- Critically assess arguments related to societal actions for sustainability
- Clearly, logically, and confidently present information and ideas in oral presentation
- Write text to a variety of audiences in such a way that clearly conveys accurate information, is based on the best available science, is grammatically correct, and is interesting to read

Format and Class Preparation

The course will involve lectures, student and instructor-led discussions, invited content expert presentations, practical in-class exercises, group collaborations and Jeopardy-style quizzes (informational, not used for grading); all delivered online via Zoom. The Zoom meeting will start at 930am in order to check technology and also provide an opportunity for questions. Keeping up with class readings is extremely important for a meaningful learning experience for yourself and your colleagues.

Readings

Required Text: Sustainability and Sustainable Development by Lisa Benton-Short. 2023. Rowman and Littlefield, New York.

Available as an EBook:

- VitalSource.com <https://www.vitalsource.com/publisher/products/sustainability-and-sustainable-development-lisa-benton-short-v9781538135372>
- RedShelf.com <https://www.redshelf.com/app/ecom/book/2244441/sustainability-and-sustainable-development-2244441-9781538135372-lisa-benton-short>

Other assigned readings, including videos, will be made available on Canvas.

Class Policies:

Attendance

Everyone is expected to complete the session's assigned readings prior to each session, attend every session, and be prepared to discuss the materials. If you need to miss a class, please notify me in advance. More than three absences without reasonable cause will earn you an F in the course.

Inclusion

It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that everyone's learning needs be addressed both in and out of class, and that the diversity of that everyone brings to this class be viewed as a resource, strength and

benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexual orientation, disability, age, socioeconomic status, ethnicity, race, culture, perspective and other background characteristics. Your suggestions about how to improve the value of diversity in this course are appreciated and encouraged. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Technology Requirements

UAF Help Desk

Go to <http://www.alaska.edu/oit/> to see about current network outages and technology news. For technical questions, contact the Help Desk at:

- e-mail at helpdesk@alaska.edu
- phone: 450.8300 (in the Fairbanks area) or 1.800.478.8226 (outside of Fairbanks)

Learning Management System

Most online courses at UAF use the Canvas Learning Management system. For the full Canvas experience, use a laptop or desktop computer running macOS 10.14 or later or Windows 10 or later.

For additional assistance with Canvas, contact the IT Services Technical Support Center helpdesk@alaska.edu and <https://www.uaf.edu/nooktech/get-help/>

Computer Hardware and Operating System

Minimum System Requirements for Desktop Service

- Monitor resolution of 1024 x 768 or higher
- Internet connection - Broadband Internet connections are highly recommended and often required
- Headset with microphone - Microphone and headphones are important for web conferencing
- Windows 10 (Windows 7/8 are provisionally supported)
- macOS 10.14 or later (macOS 10.13 is provisionally supported)

Please note that Chromebooks and mobile devices are *not* compatible with all of the technology tools you may need to use in your online courses.

Recommended Software

For the best online class experience, be sure to have the following.

- Antivirus software
- Multiple Web Browsers ([Google Chrome](#) and [Mozilla Firefox](#))
- PDF Reader ([Adobe Reader](#), [Foxit Reader](#), or macOS Preview)

- [Office Applications](#) (UA provides [Google](#) and [Microsoft Office 365](#))
- Media player ([VLC Media Player](#))

Submitting Assignments

Written assignments can be submitted by email up until midnight on the day they are due. I will send a confirmation of receipt; if you do not receive that within a couple of days, please send a follow up. **Please include your last name in the document name (e.g., Memo1.Duffy). Also make sure your name is on all of your assignments.**

Use **Word** software and **1.5 spacing** for all writing assignments. Style/citations: APA 6th Ed. See: <http://owl.english.purdue.edu/owl/resource/560/01/>

Assignments/Grades/Requirements

The course will rely on a combination of lecture, discussion of assigned readings and practical exercises; therefore, online participation and collaboration is essential. **See pages 11 and 12 for class schedule, session topics, readings and assignments.**



Source: memegenerator.net

All materials for the course are posted on UAF Canvas. Each session has its own Canvas folder containing a To Do List, Assignments, Readings and exercises. Separate folders are provided for the final examination as well as the rubrics for all assignments. Weekly readings will be discussed; the discussion will typically be initiated with questions from the instructor.

Jeopardy-style quizzes The course will use a series of Jeopardy-style quizzes to assist in retention of important topics, themes and definitions discussed and presented in the class. The quizzes will be delivered to the entire class approximately every 3 weeks. These quizzes will not be graded.



Reflections/Talking Points (10 percent). The purpose of the reflection/talking points assignments is to provide an opportunity to practice analytical and critical reading as well as communication skills. You are asked to complete a reflection or talking point every week on the assigned readings for class



discussion purposes. The reflection/talking points discussions will begin on the second week of class. The reflections/talking points may provide extensions of the weeks' readings, suggestions, questions, critiques regarding the methods and other pertinent issues. The points should be in paragraph form, and no more than 150 words and should not be a mere summary of the readings, but rather a thoughtful critique. The reflection/talking points are **due by 7pm Monday** prior to the related module or session and should be sent to jduffy@alaska.edu. Please copy and paste your reflection/talking points into the email message or attach a Word document. Please be prepared to briefly discuss your reflection/talking points as well as other topics from the readings in class which will serve as a basis for class discussions. No PowerPoint (PPT) is necessary. The purpose of this exercise is to provide the opportunity for more in-depth consideration of the reading material related to the thorny issues of sustainability.



Book Review (20 percent) Each student will write and present in class a 3-5 page book review, suitable for publication, on a book of their choosing from the following list. Only one individual will be allowed to select a specific book so make your selection as soon as possible. Once the book has been selected, the book title is to be sent to the instructor for notification. The length of the book review should not exceed 5 pages, utilizing 1” margins, 12pt font, and 1.5” spacing. The presentation should not exceed 10 minutes with an additional 5 minutes for questions and answers. A PPT (or equivalent) is required. **Please note:** After submittal, the book review will be returned with feedback and an initial grade. Everyone has the option of 1) considering the feedback, revising the review and resubmitting it for reconsideration and a final grade or 2) accepting the initial grade as final. **Please refer to the Book Review information, posted on Canvas, for ideas on content, format, and drafting.**

Book Review List:

1. Carson, Rachel. *Silent Spring*
2. Proto, Neil Thomas. *To a High Court*
3. Kolbert, Elizabeth. *The Sixth Extinction*
4. Leopold, Aldo. *A Sand County Alamac*
5. Stern, Gerald M. *The Buffalo Creek Disaster*
6. Shabecoff, Philip. *Earth Rising*
7. Friedman, Thomas L. *Hot, Flat, and Crowded*
8. Abbey, Edward. *Desert Solitaire*
9. McDonough, William. *Cradle to Cradle: Remaking the Way We Make Things*
10. Quammen, David. *The Song of the Dodo: Island Biogeography in the Age of Extinction*
11. Thoreau, Henry David. *Walden*
12. Wilson Edward O. *The Diversity of Life*
13. Stolzenburg, William. *Where the Wild Things Were*
14. Alley, Richard. *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future*
15. Weiner, Jonathon. *The Beak of the Finch: A Story of Evolution in Our Time*
16. Linden, Eugene. *The Winds of Change*
17. Daly, Herman, E. *Steady State Economics*
18. Rush, Elizabeth. *Rising*
19. Brannen, Peter. *The Ends of the World*
20. McCallum, Will. *How to Give Up Plastic*

Environmental Movie Critique (20 percent) Each student will critique an environmental movie from the following list and present the critique to the class. Only one individual will be allowed to select a specific movie so make your selection as soon as possible. Once the movie has been selected, the movie title is to be sent to the instructor for notification. The length of the movie critique should not exceed 2 pages, utilizing 1” margins, 12pt font, and 1.5” spacing. The presentation should not exceed 10 minutes with an additional 5



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minutes for questions and answers. No PPT is required. **The questions for the Movie Critique are as follows:**

- Summarize the movie,
- Explain how it relates to the sustainability and/or climate challenges,
- Describe any implications to Alaska and Arctic,
- Describe your reaction to it,
- Discuss why you believe the movie is believable or not, and
- Make a recommendation as to whether or not the rest of the class should consider viewing it.

Environmental Movie List:

The Human Element (2019)	Before the Flood (2016)
Eyes of the Orangutan (2021)	2040 (2019)
An Inconvenient Truth (2006)	RiverBlue (2017)
Artifishal (2019)	Chasing Coral (2017)
David Attenborough: A Life on Our Planet (2020)	My Octopus Teacher (2020)
Racing Extinction (2015)	The Ivory Game (2016)
Cowspiracy: The Sustainability Secret (2014)	Virunga (2014)
No Impact Man (2009)	Food Inc. (2008)
Just Eat it! A Food Waste Story (2019)	Catching the Sun (2015)
Extinction: The Facts (2020)	Seaspiracy (2021)
The Day After Tomorrow (2004)	

Short Essays (3) (20 percent)

The short essay is an assignment to produce a focused piece of writing that explains, argues, or describes a particular topic related to sustainability. The proposal should include headings in your paper, such as Introduction, Findings, Discussion, and Conclusion. This exercise is important because it provides practice in critical thinking and writing while also exploring sustainability both in theory and practice. The length of the short essay should not exceed 2 pages, utilizing 1" margins, 12pt font, and 1.5" spacing. The short essay assignments will be assigned during the semester; please see the course schedule for exact dates. **Please note:** After submittal, each short essay will be returned with feedback and an initial grade. Everyone has the option of 1) considering the feedback, revising the essay and resubmitting it for review and a final grade or 2) accepting the initial grade as final.

Collaborative Exam (30 percent). One examination will be assigned during the course. The collaborative exam will include one (1) case study that will be used to assess student understanding and application of sustainability concepts and techniques. A Discussion Board will be created on Canvas to allow the class to work as a team over a two-week period to discuss the questions, case studies and possible answers for the examination. Each student will submit their own set of answers to the examination which will be graded individually. The purpose of the examination is to foster experience in working as a team and assessing the understanding of course materials. Each collaborative exam represents 20% of the final

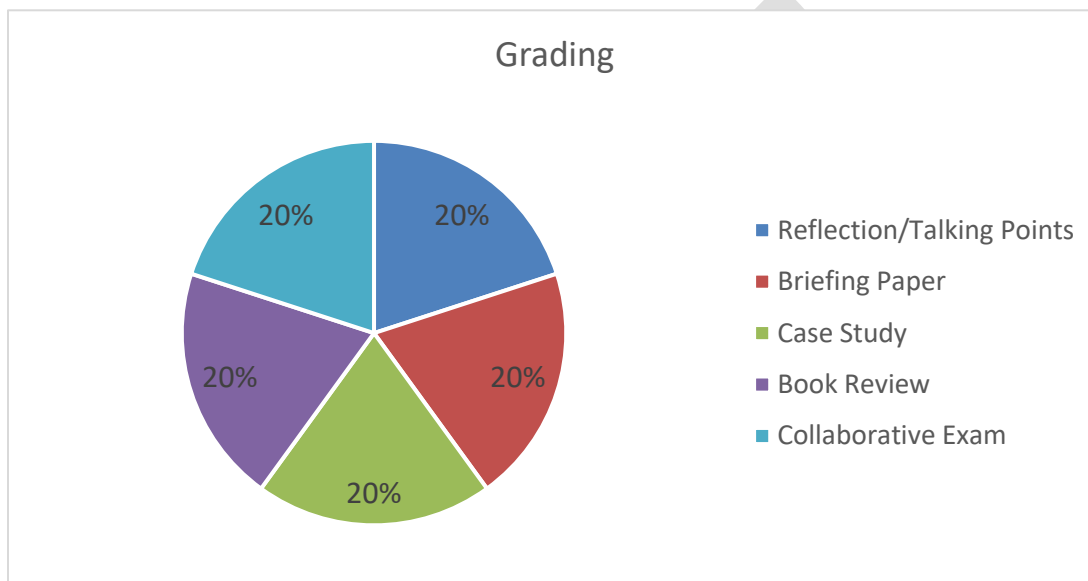


Source: uts.edu.au

grade; of the 20%, 5% is based on posted contributions via Canvas or Zoom while the remaining 15% is based on the answers provided. **Please note:** The final exam is cumulative in nature; that is, it will cover topics presented over the entire course.

Grading

Assignments handed in after the due dates are likely to receive reduced credit. The instructor reserves the right to modify the final grade in consideration of notable progress demonstrated by an individual, or unforeseen and/or extenuating circumstances. In such cases, extra credit assignments and/or makeup work may be required and used at the discretion of the instructor.



Assignment Type	Number of Assignments	Points per Assignment	Cumulative Points	Weights	Total Points
Talking Points/Reflections	11	30	330	10%	33
Book Review	1	20	60	20%	12
Movie Review	1	60	60	20%	12
Short Essays	3	30	90	20%	18
Collaborative Exam	1	200	200	30%	60
Grand Total					135

The following grading scale will apply for the course:

A:- 90% to 100%: 122pts – 135pts

B : 80% to 89%: 108pts – 121pts

C : 70% to 79%: 95pts – 107pts

D : 60% to 69%:81pts – 94pts

F : < 60%: <80pts

Ground rules

Our discussions and reading/journal topics may address controversial matters that do not have a correct or incorrect answer. There will be various opinions expressed during our

discussions. It is expected that everyone will *treat each other with respect*. In addition, allowing everyone to have an opportunity to express their thoughts and opinions and finish their comments is necessary for good discussion. Also, it is important to *listen to what others are saying before formulating a response; in the Online context think and consider the others' comments before speaking, or writing your response and hitting the "Send" key*.

Use of Artificial Intelligence (AI)

All use of AI must be declared and clearly explained in all course assignments. Please note that AI does not meet the course requirements for authorship. Furthermore, AI and large logic/language model (LLM) tools may not be listed as an author on any scholarly work submitted in this course. If used as an initial writing or research tool the use of AI is allowed though its use must be disclosed. Keep in mind that you are responsible for the accuracy, integrity and originality of your research papers and assignments including for any use of AI. In addition, any use of AI must not breach the University's plagiarism policy. All course assignments must be the your own, and not present others' ideas, data, words or other material without adequate citation and transparent referencing. A violation of this policy constitutes academic misconduct.

Expectation of Student Effort

Students should expect to spend 10-12 hours per week on this class. Students are expected to complete the weekly assignments by their due dates. If circumstances arise that cause you to need extra time on any assignment(s), e-mail your instructor for guidance.

Extensions of due dates may be granted, but your instructor expects to be informed in advance if you are not able to submit your assignment on time. (Emergency situations will be dealt with as needed.) Students are expected to maintain a working backup plan to be implemented in the event of a computer malfunction or an interruption of their normal Internet service during the course.

UNIVERSITY POLICIES

Explanation of NB/I/W grades

This course adheres to the UAF regarding the granting of NB Grades. Instructors may award a No Basis (NB) grade if there is insufficient student progress and/or attendance for evaluation to occur. No credit is given, nor is NB calculated in the GPA. This is a permanent grade and may not be used to substitute for the Incomplete. It cannot be removed by later completing outstanding work. The NB grade is for use only in situations in which the instructor has No Basis upon which to assign a grade.

Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy: "The letter "I" (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student's control, such as sickness, he has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an "I" grade."

Successful, timely completion of this course depends on committing yourself early and maintaining your effort. Failure to submit assignments in a timely manner may result in faculty-initiated Withdrawal from the course, which can result in a W on your transcript.

Adaptation

The instructor reserves the right to modify the course schedule based. **You are responsible for reading update messages on Blackboard for course schedule updates.** Final grades may also take into account notable progress demonstrated by an individual, or unforeseen and extenuating circumstances. In such cases, extra credit assignments and/or makeup work may be used at the discretion of the instructor.

Backup policy:

Students are strongly advised to save backup copies of their assignments on Google Drive or your personal computer. Do not store your projects only on the lab computers. Please save often and backup your files.

UAF Policies Disabilities Services

The University of Alaska Fairbanks is committed to providing equal access for students with disabilities. The Office of Disability Services implements the Americans with Disabilities Act (ADA) and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services (203 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities. **If you have a physical or learning disability, please advise me in writing of any special consideration necessary by the beginning of the second class.** I will do everything possible to accommodate you in accordance with the Americans with Disabilities Act. Priority seating close to the board and screen is provided for students who need to be in close proximity to the board.

If you have a learning disability that may interfere with your ability to perform the work in this course, I am happy to make any necessary accommodations. However, **it is the student's responsibility to obtain an Accommodation Letter from the Disabilities Office of the Health Center (ext.6158). This letter MUST be presented to the instructor within the first two weeks of class.** No accommodations will be made until this letter is given to the professor. Accommodations will NOT be made retroactively (i.e. if you have a spelling disability, you must present the letter before any points are deducted for spelling).

Student Protections And Services Statement

UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX) faculty members are designated as responsible employees which means they are required to report sexual misconduct. graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: <https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/>. Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

Student Services

Go to the Student Handbook (<https://www.uaf.edu/handbook/>) for things like: academic advising, tutoring, library and academic support, disability services, computing and technology, veteran and military support, academic complaint and appeals, late withdrawals, “classroom” behavior expectations and more.

UAF eLearning Student Services helps students with registration and course schedules, provides information about lessons and student records, assists with the examination process, and answers general questions. Our Academic Advisor can help students communicate with instructors, locate helpful resources, and maximize their distance learning experience. Contact the UAF eLearning Student Services staff at 907.455.2060 or toll free 1.800.277.8060 or contact staff directly – for directory listing see:

<http://elearning.uaf.edu/contact>

Effective Communication

Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from:

[UAF Department of Communication’s Speaking Center](#) (907.474.5470, speak@uaf.edu)

[UAF English’s Department’s Writing Center](#) (907.474.5314, Gruening 8th floor)

[CTC’s Learning Center](#) (604 Barnette st, 907.455.2860).

Notice of nondiscrimination

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: www.alaska.edu/titleIXcompliance/nondiscrimination

Academic Integrity/ Student Code of Conduct

As described by UAF, scholastic dishonesty constitutes a violation of the university rules and regulations and is punishable according to the procedures outlined by UAF. Scholastic dishonesty includes, but is not limited to, cheating on an exam, plagiarism, and collusion. Cheating includes providing answers to or taking answers from another student. Plagiarism includes use of another author’s words or arguments without attribution. Collusion includes unauthorized collaboration with another person in preparing written work for fulfillment of any course requirement. Scholastic dishonesty is punishable by **Academic Rights of Students** removal from the course and a grade of “F.” For more information go to [Student Code of Conduct](#).

An explanation of plagiarism and how to properly cite sources are available at the following two sites:

<http://library.uaf.edu/l101-plagiarism>

<http://library.uaf.edu/l101-citing>

Plagiarism is grounds for course failure.

The university has policies related to your rights as a student and the process for working through any disputes you may have. Those processes may be found in the section of the catalog covering Academic Rights of Students and the Academic Dispute Resolution Procedure.

Course Schedule, Readings, and Assignments

Session 1 Tuesday & Thursday; January 16 & 18, 2024

Topic: Welcome, Syllabus, Introductions, Tools for Academic Success

Readings & Assignments:

- Review syllabus
 - (Rogers, 2013) pp - All
 - Writing Book Reviews – Both Purdue Owl and University of Indiana pieces pp - All
 - Scientifically Speaking pp - ALL
-

Session 2 Tuesday & Thursday, January 23 & 25, 2024

Topic: Systems Thinking

Readings & Assignments:

- (Head & Alford, 2013) pp – All
-

Session 3 Tuesday & Thursday, January 30 & February 1, 2024

Topic: Contemporary environmental challenges

Readings & Assignments:

- Arctic Report Card pp 2-7
 - Report to Congress on Arctic Research Plan pp 24-30
 - Alaska and Climate Change pp All
 - (Ripple et al. 2023) pp All
 - Short essay #1 Issued
-

Session 4 Tuesday & Thursday, February 6 & 8, 2024

Topic: Ecosystem Dynamics I

Readings & Assignments:

- (Chapin III, Kofinas & Folke, 2009) pp 18 – 26
 - Jeopardy #1
-

Session 5 Tuesday & Thursday, February 13 & 15, 2024

Topic: Ecosystem Dynamics II

Readings & Assignments:

- (Chapin III, Kofinas & Folke, 2009) pp 29 – 52
 - Short essay #1 Due
-

Session 6 Tuesday & Thursday, February 20 & 22, 2024

Topic: What is Sustainability and Sustainable Development?

Readings & Assignments:

- (Benton-Short, 2023) pp 1 - 26
-

Session 7 Tuesday & Thursday, February 27 & 29, 2024

Topic: Climate Change

Readings & Assignments:

- (Benton-Short, 2023) pp 383 – 410
 - Short essay #2 Issued
-

Session 8 Tuesday & Thursday, March 5 & 7, 2024

Topic: Terrestrial Ecosystems and Biodiversity

Readings & Assignments:

- (Benton-Short, 2023) pp 443 – 472
 - Jeopardy #2
-

• **Spring Break March 11 - 15, 2024 No Class**

Session 9 Tuesday & Thursday, March 19 & 21, 2024

Topic: Production and Consumption

Readings & Assignments:

- (Benton-Short, 2023) pp 353 – 382
 - Short essay #2 Due
-

Session 10 Tuesday & Thursday, March 26 & 28, 2024

Topic: Sustainable Cities

Readings & Assignments:

- (Benton-Short, 2023) pp 324 – 352
 - Short essay #3 Issued
-

Session 11 Tuesday & Thursday, April 2 & 4, 2024

Topic: Hunger and Food Insecurity

Readings & Assignments:

- (Benton-Short, 2023) pp 61 – 94
 - Jeopardy #3
-

Session 12 Tuesday & Thursday, April 9 & 11, 2024

Topic: Gender Equality

Readings & Assignments:

- Movie critique presentations
 - (Benton-Short, 2023) pp 151 – 177
 - Short essay #3 Due
-

Session 13 Tuesday & Thursday, April 16 & 18, 2024

Topic: Presentations

Readings & Assignments:

- Book review presentations
 - Course Review
 - Final Exam Issued
-

Session 13 Tuesday & Thursday, April 23 & 25, 2024

Topic: Final Exam

Readings & Assignments:

- Final Exam Discussion Board
-

Session 14 Tuesday & Thursday, April 30, & May 2, 2024

Topic: Final Exam Discussion

Readings & Assignments:

- Final Exam Due
-