

**NRM 111-FXA INTRODUCTION TO SUSTAINABILITY SCIENCE  
SPRING 2021; CRN: 33716**

**Course Information**

Instructor: Dr. Sarah Trainor. Phone: 907 474 7878; email: [sarah.trainor@alaska.edu](mailto:sarah.trainor@alaska.edu)  
Office Hours by Appointment.

**Course Type:** Online Synchronous. The course will meet via zoom with heavy use of Blackboard.

Zoom log-in:

<https://alaska.zoom.us/j/86981076343?pwd=TzNrWnFLQ1FOc2l6Zi85TkhFM00rQT09>

Meeting ID: 869 8107 6343

Passcode: 890970

One tap mobile

+16699006833,,86981076343# US (San Jose)

+12532158782,,86981076343# US (Tacoma)

**Readings: You are expected to read all assigned readings.**

Edwards, A. R. 2005. The Sustainability Revolution, Portrait of a Paradigm Shift. New Society Publishers. Gabriola Island, BC Canada.

Available as an EBook: <https://www.newsociety.com/Books/T/Thriving-Beyond-Sustainability>

Available in print used at Amazon.com.

Edwards, A. R. 2010. Thriving Beyond Sustainability, Pathways to a Resilient Society. New Society Publishers. Gabriola Island, BC Canada.

Available in print and as an EBook:

<https://www.newsociety.com/Books/T/Thriving-Beyond-Sustainability>

Paul, R. and Elder, L. 2016. The Miniature Guide to Critical Thinking. Foundation for Critical Thinking. 7<sup>th</sup> Edition.

Available at [www.criticalthinking.org](http://www.criticalthinking.org).

**Other assigned readings will be made available on Blackboard.**

**Catalog 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 Description**

In this course we cover the four primary dimensions of achieving sustainability, known by some as the 4 “E”s: 1) environment/ecology, 2) economy/employment, 3) equity/equality and 4) education. The course draws on several underlying principles, including systems thinking, resilience theory, ecological economics, vulnerability analysis, and adaptive governance. Students are expected to enter the course with basic knowledge and understanding of contemporary sustainability challenges such as climate change, biodiversity loss, pollution and solid waste management, 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 student led projects, 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.

### **Technical Requirements**

Students must have regular access to a computer and the Internet to access online materials in Blackboard. Students will be expected to download course material as well as upload assignments.

### **Instructional Methods**

This class will engage lectures, readings, online quizzes and exams, self-reflection, group projects, and written and oral assignments.

### **Assignments/Requirements & Grades**

Your grade will be calculated according to the table below. More information about these assignments can be found on Blackboard under “Assignments.” Extra credit will be available, however, if you would like extra credit opportunities, you must discuss this option with the professor **no later than week 10**. Your Sustainability in Practice Project Presentation may be made available for future students in this class to watch.

		Point Value
1)	Participation – contribution to class discussion and chat via zoom, communicating with instructor, contribution to non-graded and on-line discussions, etc.	25
2)	Paradigm Shift/Sustainability Revolution Essay	20
3)	Critical Thinking Reading Analysis Exercises (3 exercises; point values graduated so later assignments are worth more points as the expectation is that you will learn and improve as you go)	30
4)	Course Concept Reflection Essay	25
5)	Critical Thinking Essay – The 3 “E”s	50
6)	Sustainability-in-Practice Project Presentation	50
7)	Field Trip Write-Up	50
8)	Final Exam	50
	Total Points Available	300

**Consult the course schedule and related updates and messages on Blackboard for due dates.**

### **Course Participation**

Students are expected to complete all of the assigned readings and on-line modules and to turn in the assignments by the due dates. If you fall behind it is your responsibility to contact the instructor with a work plan for catching up.

**Assignments handed in after the due dates will receive reduced credit. Assignments more than 1 week late will receive a zero unless prior arrangements have been made with the instructor.**

### **Grading**

Each assignment and requirement will be evaluated based on the [UAF grading system](#):

- A      "A" (including A+ and A-) indicates a thorough mastery of course content and outstanding performance in completion of course requirements.

- B “B” (including B+ and B-) indicates a high level of acquired knowledge and performance in completion of course requirements.
- C “C” (including C+ and C-) indicates a satisfactory level of acquired knowledge and performance in completion of course requirements.
- D “D” (including D+ and D-) indicates a minimal level of acquired knowledge and minimal performance in completion of course requirements. This grade does not satisfy requirements for courses in the major, minor, core or graduate programs.
- F “F” indicates failure to meet a minimal level of understanding of course content and/or performance in completion of course requirements. All F grades, including those earned in pass/fail courses, are included in the GPA calculations.

C- (1.7) is the minimum acceptable grade that undergraduate students may receive for courses to count toward the major or minor degree requirements, or as a prerequisite for another course. A minimum grade of C (2.0), however, MAY be required by specific programs for prerequisite and/ or major / minor courses. Please consult specific program listings in the UAF Catalog.

C- (1.7) is the minimum acceptable grade required for all General Education (X) Courses.

The following grading scale will apply:

A - 90 to 100 (A- 90-91; A+ 99-100)

B - 80 to 89 (B- 80-81; B+ 88-89)

C - 70 to 79 (C- 70-71; C+ 78-79)

D - 60 to 69 (D- 60-61; D+ 68-69)

F - < 60

### **How To Check Your Grade**

To check your grades for assignments/quizzes and find comments from your instructor, click on the My Grades link in the sidebar menu of Blackboard. All assignments and any due dates are listed. If your instructor has left overall assessment comments, Click on the speech bubble icon to view overall comments and feedback.

If the score is for a test or quiz, the title of the test is a link. Then click on the check mark or your score to see results and feedback.

If the score is for an assignment, the title of the assignment is a link and by clicking this link you'll be taken to your submission, grade and comments.

If you see a green exclamation point, your assignment has not been graded yet.

### **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.

### **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.

### **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

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/ls101-plagiarism>

<http://library.uaf.edu/ls101-citing>

### **Plagiarism is grounds for course failure.**

### **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/>.

### **COVID-19 statement:**

Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website:

<https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0>

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>

### **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](mailto:helpdesk@alaska.edu)
- phone: 450.8300 (in the Fairbanks area) or 1.800.478.8226 (outside of Fairbanks)

### **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](mailto: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](http://www.alaska.edu/titleIXcompliance/nondiscrimination)

## Course Calendar

**THIS CLASS SCHEDULE IS SUBJECT TO REVISION AND UPDATE.**  
**CHECK BLACKBOARD ANNOUNCEMENTS FOR UPDATES.**

Week	Topic	Key Concepts	Readings	Assignments
1 - Jan 12, 14	Course Introduction – Sustainability in the Arctic		>Syllabus, schedule, Assignments, course concepts >Alaska's Changing Environment 2019 >Alaska's Changing Wildfire Environment 2020 >Arctic Observing 2020	<ul style="list-style-type: none"> <li>● Introduce yourself</li> <li>● What does “sustainability” mean to you?</li> <li>● Present one example of an issue of sustainability that interests you</li> </ul>
● PART 1 – PRINCIPLES OF SUSTAINABILITY, CRITICAL THINKING				
2 – Jan 19, 21	What is Sustainability Science?	<ul style="list-style-type: none"> <li>● Definition of Sustainability</li> <li>● Social-Ecological Systems</li> <li>● Pasteur's Quadrant</li> <li>● Use-Inspired Basic Research</li> </ul>	Clark 2007, Kates 2001	<ul style="list-style-type: none"> <li>● Module 2 Learning Activity</li> <li>● SUBMIT PREFERENCES FOR SUSTAINABILITY IN PRACTICE TOPIC. Presentations will be in weeks 10- 14</li> </ul>
3 – Jan 26, 28	Humans and Sustainability/ Sustainability Revolution	<ul style="list-style-type: none"> <li>● Definition of Sustainability</li> <li>● 3”E”s of Sustainability</li> <li>● Paradigm Shift</li> </ul>	Sustainability Revolution: Introduction & Ch. 1	<ul style="list-style-type: none"> <li>● Module 3 Learning Activity</li> <li>● Paradigm Shift/ Sustainability Revolution Essay</li> </ul>
4.1 –	Ecosystem Services &	<ul style="list-style-type: none"> <li>● Ecosystem Services</li> </ul>	Chapin et al <i>Principles of</i>	<ul style="list-style-type: none"> <li>● Module 4 Learning Activity</li> </ul>



Feb 2	Forms of "Capital"	<ul style="list-style-type: none"> <li>• Forms of "Capital"</li> </ul>	<i>Ecosystem Stewardship</i> <b>(pp. 19-20)</b>	
4.2 – Feb 4	Critical Thinking: What is it? How do we do it? Why is it important?	<ul style="list-style-type: none"> <li>• Critical Thinking</li> </ul>	Elder & Elder pp. 1-24	<ul style="list-style-type: none"> <li>• Critical Thinking Exercise with Clark 2007, Sustainability Science</li> </ul>
5.1 – Feb 9	System Dynamics	Systems Thinking/Approach <ul style="list-style-type: none"> <li>a. Amplifying feedback</li> <li>b. Stabilizing feedback</li> <li>c. Tipping points/thresholds</li> <li>d. Cross-Scale Linkages</li> <li>e. Legacies</li> <li>f. Path dependence</li> </ul>	Miller & Spoolman Excerpt Chapin et al Excerpt #2	<ul style="list-style-type: none"> <li>• Module 5.1 Learning Activity</li> <li>• FIELD TRIP PROPOSAL DUE</li> <li>• PARADIGM SHIFT/ SUSTAINABILITY REVOLUTION ESSAY DUE</li> </ul>
5.2 – Feb 11	Why Civilizations Collapse	<ul style="list-style-type: none"> <li>• Systems Thinking</li> <li>• Sustainability Framework</li> <li>• Critical Thinking</li> </ul>	J. Diamond, <i>Collapse</i> , 2007: Ch 14: Why Do Some Societies Make Disastrous Decisions?	<ul style="list-style-type: none"> <li>• Module 5.2 Learning Activity</li> <li>• Critical Thinking Analysis for J. Diamond Ch. 14</li> </ul>
6.1 – Feb 16	Sustainability Framework	Sustainability Framework <ul style="list-style-type: none"> <li>• Adaptation/ Adaptive capacity</li> <li>• Vulnerability</li> <li>• Resilience</li> <li>• Transformability /transformation</li> </ul>	Chapin et al 2009. Trends in <i>Ecology and Evolution</i>	<ul style="list-style-type: none"> <li>• Week 6.1 Learning Activity</li> </ul>
6.2 – Feb 18	Limits to Growth	<ul style="list-style-type: none"> <li>• Critical Thinking</li> </ul>	Limits to Growth – Meadows 30 Yr Update	<ul style="list-style-type: none"> <li>• Critical Thinking Analysis Limits to Growth</li> </ul>
7.1 – Feb	Economics, Environment and	<ul style="list-style-type: none"> <li>• Economics &amp; Environment</li> </ul>	Miller & Spoolman Ch 23	<ul style="list-style-type: none"> <li>• Week 7 Learning Activity</li> </ul>

23	Sustainability		<i>Thriving Beyond Sustainability</i> , Ch: 5: Saving Ecosystems	
8.1 – Mar 2	Sustainability Tool Box	● Sustainability Tool Box	No new readings - Review	<ul style="list-style-type: none"> <li>● Week 8 Learning Activity</li> <li>● Mid-Course Evaluation</li> </ul>
8.2 – Mar 4	Sustainability in Practice Presentation		Your own research	<ul style="list-style-type: none"> <li>● Select a case study for your Sustainability in Practice Presentation</li> <li>● Post description and relevant info found to date about your case study to your Group Discussion Board</li> </ul>
● PART II – SUSTAINABILITY IN ACTION				
	SPRING BREAK – Mar 8-12			
9 – Mar 16- 18	<p>Zoom class time available for Sustainability in Practice Group work</p> <p>This wee work on:</p> <ul style="list-style-type: none"> <li>● Course Concept Reflection (DUE week 10)</li> <li>● Sustainability in Practice Presentations (DUE see below)</li> <li>● Field Trip Assignment (DUE week 13)</li> </ul> <p>Details on all of these assignments can be found in the “Assignments” section on Blackboard (top, left menu bar)</p> <p>&gt;&gt;&gt;&gt;TOPICS in WEEKS 10-15 SUBJECT TO CHANGE BASED ON STUDENT INTEREST&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;</p>			
10. 1 – Mar 23	Governance, Environment and Sustainability	● Governance, Environment and Sustainability	Ch 2: Sustainability & Community. <i>Thriving Beyond Sustainability</i> , Ch. 2: Going “Glocal”	Sustainability In Practice Presentation: Local Action for Global Change Discussion Comments

10. 2 – Mar 25	Sustainability and Commerce	<ul style="list-style-type: none"> <li>• Sustainability and Commerce</li> </ul>	<i>Sustainability Revolution</i> , Ch. 3: Sustainability and Commerce <i>Thriving Beyond Sustainability</i> , Ch. 3: Greening Commerce	<ul style="list-style-type: none"> <li>• Week 10 Learning Activity</li> <li>• COURSE CONCEPT REFLECTION ESSAY DUE</li> </ul>
11. 1 – Mar 30	Sustainability and Natural Resources – Certification Programs	<ul style="list-style-type: none"> <li>• Sustainability certification programs</li> </ul>	<i>Sustainability Revolution</i> , Ch. 4: Sustainability and Natural Resources	<ul style="list-style-type: none"> <li>• Week 11 Learning Activity</li> </ul>
11. 2 – Apr 1	Sustainability and Natural Resources – Adaptive Management	<ul style="list-style-type: none"> <li>• Adaptive Management</li> </ul>	<a href="https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/Chapter1.pdf">https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/Chapter1.pdf</a>	Sustainability in Practice Presentation: Natural Resources – Adaptive Management Discussion Comments
12. 1 – Apr 6	Environmental Justice	<ul style="list-style-type: none"> <li>• Environmental Justice</li> </ul>	Agyeman Ch. 11 – Environmental Justice and Sustainability in Handbook of Sustainable Development. Trainor et al Ch. 8 – Environmental Injustice in Canada and the Far North	Critical Thinking Analysis (p.11) DUE for Trainor et al Ch. 8  Sustainability in Practice Presentation: Environmental Justice
12. 2 – Apr 8	Sustainable Agriculture	<ul style="list-style-type: none"> <li>• Three legged stool</li> <li>• Food security</li> </ul>	SARE's Farm to Table: Building Local and Regional Food Systems  Adapt AK website on Tyonek Community Garden	Sustainability in Practice Presentation: Sustainable Agriculture

13. 1 – Apr 13	Sustainability & Ecological Design	<ul style="list-style-type: none"> <li>● Ecological Design</li> <li>● Industrial Ecology</li> </ul>	<i>Sustainability Revolution</i> , Ch 5: Sustainability and Ecological Design <i>Thriving Beyond Sustainability</i> , Ch. 4: Regenerative Design	<ul style="list-style-type: none"> <li>● Week 13 Learning Activity</li> </ul>
13. 2 – Apr 15	Sustainability and Indigenous Peoples	Sustainability and Indigenous Peoples -- <i>Standing Rock</i> . Guest Speaker: <ul style="list-style-type: none"> <li>● Bethie Robertson</li> </ul>	TBA	<ul style="list-style-type: none"> <li>● Sustainability and Indigenous Peoples Learning Activity</li> </ul>
● PART III – FIELD TRIPS & COURSE REVIEW				
13	Field Trip –	<ul style="list-style-type: none"> <li>● All</li> </ul>	DUE WEEK 13 – You may request an extension if your field trip involves Earth Day or other activities late in April	<ul style="list-style-type: none"> <li>● Field Trip Write Up &amp; Comments DUE</li> </ul>
14 – Apr 20, 22	Where do we go from Here? Course Wrap- Up	<ul style="list-style-type: none"> <li>● All</li> </ul>	<i>Thriving Beyond Sustainability</i> , Ch. 6: Navigating the Confluence & Ch. 7: Catalysts for Change <i>Thriving Beyond Sustainability</i> , Ch. 8: A Thriveable Future	<ul style="list-style-type: none"> <li>● Course wrap-up learning activity</li> <li>● Critical Thinking 3 “E”s ESSAY DUE</li> </ul>
15				FINAL EXAM