

**NRM 111X INTRODUCTION TO SUSTAINABILITY SCIENCE
SPRING 2023; CRN: 37137**

Prerequisites: NRM 101, Placement in English 111

Course Information

Meeting time and location: Online asynchronous

Instructor: Dr. Tsitsi McPherson.

Phone: 907-474-7188 (note: this is the department phone)

email: tmcpherson2@alaska.edu

Office Hours: by appointment, see course Canvas home page to make an appointment

Course type: Online asynchronous. What is an asynchronous course? An asynchronous course is one that allows students the flexibility to self-pace weekly online course content including assignment. This asynchronous course has submission deadlines, but students can connect with materials and peers according to their schedule.

Readings: You are responsible for reading all assigned readings and expected to engage with the material through feedback comments in various discussion boards.

Nissenbaum, Richard, A. 2019. Sustainable Solutions: Problem Solving for Future Generations, 1st edition. Oxford University Press

Paul, R. and Elder, L. 2018. The Miniature Guide to Critical Thinking. Foundation for Critical Thinking. 7th Edition. Available at www.criticalthinking.org.

Other assigned readings will be made available on Canvas.

Course Description

Sustaining the health, wellbeing, and productivity of the global social- ecological system requires considerations from many disciplinary and cultural perspectives. Social, economic, and ecological assessment of sustainability challenges need to be considered in an integrated way to arrive at robust solutions that avoid unanticipated consequences. Meeting these challenges often requires action plans that move from understanding theory to the implementation of new policies and facilitation of behavioral change.

This course studies dimensions of achieving sustainability. It 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.

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 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

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 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 Canvas. Students will be expected to download course material as well as upload/enter text for assignments, engage in discussion forums and provide feedback through forums such as discussion boards and Flipgrid.

Assignments/Requirements

- 1) Learning Activity: These activities allow students to engage in activities to explore course learning objectives and goals. Activities include exploration of effective communication about sustainability.
- 2) Critical Thinking Exercise and Essays: Students will work to develop skills to facilitate critical assessment of solutions related to societal actions for sustainability.
- 3) Self-Reflection Papers: Understanding student motivation and learning needs is evaluated in these exercises/essays.
- 4) Sustainability Portfolio: - Sustainability in Practice: The goal of this assignment is to become knowledgeable about examples of sustainability in practice. Students will be tasked with exploring Sustainability from scales: UAF or Fairbanks, a city located along the 64th parallel, and a topic narrowed down by the student and selected by the instructor. Students are expected to research examples of sustainability in practice, give a presentation on one example, and write accompanying one page fact sheets.
- 5) Class Discussion: Discussion Boards and Flip Grids represent virtual class discussions and one-on-one student interactions. This class is interactive, relying on strong student contribution through discussion boards and Flip Grids. The atmosphere in these forums will be respectful and productive and one that encourages the joint class exploration of course themes. The discussion board and flip grids will work best if everyone participates. Expect to see these forums as a place to address comments posed by your course instructor and feedback from your peers. Discussions will take three forms
 - a. Lecture Feedback: Students are required to read/listen to Power Point class lectures and provide comment/feedback. This class is interactive, relying on strong student contribution.
 - b. Sustainability in the News: As we speak about Sustainability in the theoretical context in the class, Sustainability in News discussions draw from events in Fairbanks, Fairbanks North Star Borough, and Alaska as illustrations of how theory and practice meet.
 - c. Flip Grid: FlipGrids offer the opportunity to record your feedback to a prompt by recording a short video response
- 6) Quizzes: Quizzes occur throughout the semester and may cover lecture material, content from readings, or videos.
- 7) Exam: You will have three exams and a final exam. The final exam for the course will draw heavily from homework assignments, in-class exercises, and class lectures and will include questions previously accessed in exams. **The final exam is scheduled for Wednesday, May 3.** The exam will be opened for a specified amount of time with students completing at their own pace.

8) Grades

Your grade will be calculated as follows:

| | | Percentage of Final Course Grade |
|----|---|----------------------------------|
| 1) | Discussions (eg. Lecture, Sustainability in the News) | 20% |
| 2) | Learning Activity | 15% |
| 3) | Critical Thinking Exercises and Essay | 10% |
| 4) | Self-Reflection Papers | 10% |
| 5) | Sustainability Portfolio | 20% |
| 8) | Quizzes and Exams | 25% |
| | Total | 100% |

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

Students are expected to complete all 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.

Each assignment and requirement will be evaluated on the following basis:

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

A: Is original, unique, ambitious and outstanding in concept, design and execution. Execution of work is considered excellent and demonstrated deep understanding and experimentation with materials and techniques. All work is finished on time and presented clearly and attractively. Technical challenges are actively tackled and overcome.

B+: Work is well executed with a high degree of competency and range of techniques. Work meaningfully fulfills the criteria of the assignment and communicates the concept. Work is well presented and on time.

B-: Work is complete but average in concept, design and technique. Work is limited by technical weakness and limited technique. Although satisfactory the work could use improvement.

C: Work is poor in design, concept and execution. Work is poorly presented or unfinished. Work is not innovative, creative or showing self-motivation. Technical skills are not mastered.

D: Work represents minimal effort, does not demonstrate understanding of material, is not well articulated or well organized.

F: The student did not hand in work. Work does not address the criteria of the assignment. Work fails to meet the minimum requirements of the professor in quality or quantity.

Grading:

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

Adaptation

The instructor reserves the right to modify the course schedule based on availability of student preferences for presentation topics and other related factors. **You are responsible for reading update messages on Canvas 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](#).

Student Code of Conduct

According to the UAF code of conduct "Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless the instructor of the course grants permission.... Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports.... No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors....." Students are expected to abide by the UAF

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

<http://library.uaf.edu/lis101-plagiarism>

<http://library.uaf.edu/lis101-citing>

Plagiarism is grounds for course failure.

Instructional Methods

The course will use a combination of lectures, student discussions, student projects and a student presentation. This class is interactive, relying on strong student contribution. The class atmosphere will be respectful and productive and one that encourages the joint class exploration of course themes. This class will work best if everyone participates.

Class policy:

Students are expected to spend at least 6-9 hours/week working on course content. Students must save and backup files. 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 us 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).

Canvas

Canvas as a learning management system (LMS)

UAF is currently adopting the learning management system (LMS) Canvas. Over the next few semesters, more and more of your UAF courses will use Canvas instead of Blackboard. If you principally use a non-UAF email service, (such as yahoo) go to your UAF account and forward your UAF email to that address.

Canvas offers 24/7 student support via email, phone or live chat. Canvas student support is available using the following links with further details available at <https://www.uaf.edu/uaf/current/canvas.php>

Email: support@instructure.com

Student hotline: 1-844-683-6439

Student live chat: [Live chat](#)

Class Schedule: This class schedule is subject to revision and update. Check Canvas for updates. The outline below provides a weekly timetable of how to work on class material. As an asynchronous class, this schedule is intended to assist you in providing a structure on how to proceed through the course.

| January 2023 | | | | | | February |
|--|-----|--|--|--|--|----------|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| <p>Suggested work order for a typical week: Monday: Review course work for the week AND/OR Exam submission date Tuesday: Course lecture and/or Course reading and/or Videos Wednesday: Course reading and Videos and posting to discussion boards Thursday: Course lecture and Course reading Friday: Activity due Sat: catch up/get ahead/relax Sun: catch up/get ahead/relax</p> | | | | | | |
| 15 Module 1 WEEK 1 What is sustainability science? | | 17 Class introduction Orient yourself to course website * What is sustainability (pptx) <i>Sustainability in the Arctic</i> <i>Arctic Sustainability in Troubled Times</i> | 18 <i>Sustainability in the Arctic</i> <i>US Arctic Vision (video link)</i> Post to discussion board | 19 * What is sustainability science (pptx) READ -Clark 2007 -Kates 2011 | 20 DUE: - Syllabus quiz - Personal introduction on flipgrid - Self Reflection #1 - Feedback response to discussion board (THIS IS A TRIAL ... EXTRA CREDIT) | |
| 22 WEEK 2 What is Sustainability Science and Critical Thinking | | 24 * Sustainability Science, the problems (pptx) READ: Nissenbaum Ch. 1: <i>The Problem we must solve</i> | 25 * Complex Systems and Pasteur's Quadrant (pptx) * Use Inspired Science (pptx) Post to sustainability in the news discussion board READ <i>Sustainability in the Arctic</i> * Introduction from <i>National Strategy for the Arctic Region</i> , pg. 1-4] * Alaska's Changing Environment | 26 * Critical Thinking, What is it (pptx) <i>Five simple strategies to sharpen your critical thinking (Video link)</i> READ: -Elder (2016) <i>Miniature Guide to Critical Thinking. Pages (7-21)</i> | 27 DUE - Learning Activity: Communicating about Sustainability -Feedback response to sustainability in the news discussion board | |

| January 2023 | | | | | | |
|---|-----|---|-----|-----|-----|-----|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| WEEK 3 Humans and Sustainability Studies | 30 | 31 * Ecosystem services and types of capital (pptx) - Theis et al. Ch4. Biosphere. 4.1 Biosphere Introduction. Pgs 117-119 - Chapin et al. Principles of Ecosystem Stewardship. Ecosystem Services | | | | |

| February 2023 | | | | | | |
|---------------------------|---|--|---|---|---|-----|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| | | | 1 * The E's of Sustainability (pptx) Nissenbaum Ch. 2: Sustainable solutions Video: A Conversation With....F. Stuart Chapin – Social ecological systems Post to discussion board About Sustainability Portfolio (pptx) | 2 * Sustainability Framework (pptx) READ Changing Conditions in the Arctic (pg.5-6) from National Strategy for the Arctic Region -Chapin et al. (2019). Ecosystem stewardship – sustainability strategies for a rapidly changing planet | 3 DUE - Critical thinking exercise (Clark 2007) - Feedback response to discussion board - Sustainability Portfolio Topic Selection due | 4 |
| WEEK 4 System Dynamics | 6 Critical Thinking Essay Assigned (Due April 7) | 7 System Dynamics . part I (pptx) READ Miller & Spoolman Excerpt (pgs. 44-47) | 8 READ Chapin et al (eds). Principles of Ecosystem Stewardship. Pgs. 3-12) Excerpt Post to discussion board | 9 System Dynamics . part II (pptx) | 10 DUE - Learning Activity: Forms of Capital and Ecosystem Services activity -Feedback response to sustainability in the news discussion board | 11 |

| February 2023 | | | | | | |
|---|------------------------------------|---|---|---|---|-----------|
| ◀ January | | | | | | March ▶ |
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| 12 WEEK 5 Limits to Growth and Implications | 13 | 14 Limits to Growth (pptx) READ: <i>Limits to Growth – Meadows 30yr Update</i> | 15 READ <i>J. Diamond, Collapse, 2007: Ch 14: Why Do Some Societies Make Disastrous Decisions?</i> Post to discussion board | 16 Why civilizations collapse (pptx) | 17 DUE - Feedback response to discussion board - Critical Thinking Analysis: Limits to Growth 30yr Update - Learning Activity – Communicating about Sustainability -Module 1 Quiz | 18 |
| 19 MODULE 2: Governance WEEK 6 Sustainability Framework and Levels of Interaction | 20 EXAM 1 DUE BY 11:59PM | 21 Governance and Sustainability (pptx) READ <i>Nissenbaum, Ch. 9: Sustainability at the Most Local Level – The Individual</i> | 22 Video: Jimmy Fox discussion about the process, goal and future of FNSB sustainability plan Post to discussion board | 23 Governance, Individuals to Organizations and Institutions (pptx) <i>Nissenbaum, Ch.10: Organizations, Institutions and Sustainability</i> | 24 DUE - Feedback response to sustainability in the news discussion board - Critical Thinking Analysis: J. Diamond. Why Civilizations Collapse. Ch.14 | 25 |
| 26 WEEK 7 Sustainability Planning and Development | 27 | 28 Economics, Environment and Sustainability (pptx) Sustainable Communities, Fairbanks example (pptx) READ <i>Nissenbaum, Ch. 11: Sustainable Communities, Cities, and Regions</i> | | | | |

| ◀ February | | March 2023 | | | | | April ▶ |
|---|---|--|--|--|--|-----------|---------|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat | |
| | | | 1 Video: Hroon, Iceland discussion Post to discussion board | 2 Arctic Governance (pptx) READ Arctic Council readings: - History Arctic Council - Arctic Council Quick Guide pgs. 1-15 - Arctic Council Strategic Guice pgs. 1-8 Review: Nissenbaum, Ch. 12: Sustainable Development and Global Sustainability | 3 Due: - Weekly Discussion Posting or Sustainability in the News | 4 | |
| 5 Week 8 Environmental Justice | 6 | 7 Environmental Justice (pptx) Environmental justice video READ Environmental Justice reading | 8 Sustainability in Indigenous Rural Communities (pptx) Post to discussion board | 9 READ Theis et al. Ch10 Sustainability: Ethics, Culture and History. 10.8 Sustainability Ethics Pgs 503-509 | 10 Due: - Weekly Discussion Posting or Sustainability in the News - Critical Thinking Environmental Justice - Self Reflection 2 - Draft for Part I Sustainability Portfolio Due | 11 | |
| 12 Week 9 | 13-17 SPRING BREAK | | | | | 18 | |
| 19 Week 10 Sustainability Toolbox, Connecting Concepts | 20 | 21 Sustainability Toolbox, Concept Review (pptx) - Complete and submit Part 1 | 22 Sustainability Toolbox, Concept Review (pptx) - Complete and submit Part 2 Post to discussion board | 23 Sustainability Toolbox, Concept Review (pptx) - Complete and submit Part 3 | 24 - Weekly Discussion Posting or Sustainability in the News - Module 2 quiz | 25 | |

| March 2023 | | | | | | |
|--|------------------------------------|--|---|---------------------------------------|--|-----|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| 26 Week 11 Sustainability – Human Landscapes | 27 EXAM 2 DUE BY 11:59PM | 28 Nissenbaum, Ch. 3: The Air We Breathe (pptx) | 29 <i>READ</i> <i>Health Effects of Ozone and Particle Pollution _ State of the Air _ American Lung Association</i> <i>With No Response From EPA, Fairbanks Community Groups File Suit to Force EPA to Address Pollution</i> Post to discussion board | 30 Nissenbaum, Ch. 4: Water (pptx) | 31 - Weekly Discussion Posting or Sustainability in the News - Draft for Part II Sustainability Portfolio Due | |

| April 2023 | | | | | | |
|--|---|---|--|---|--|-----|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| | | | | | | 1 |
| 2 MODULE 3: In Practice Week 12 | 3 | 4 Nissenbaum, Ch. 5: Food and Agriculture (L)(pptx) | 5 Video: TBA Post to discussion board | 6 Nissenbaum, Ch. 8: Solving Our Garbage Problem (pptx) | 7 [[Good Friday]] - Weekly Discussion Posting or Sustainability in the News - Critical Thinking Essay Due | 8 |
| 9 [[Easter Sunday]] Week 13 | 10 | 11 Nissenbaum, Ch.6: Energy from Fossil Fuels to a Sustainable Future (pptx) | 12 Video: Solarize Alaska Video: Fairbanks Carbon Reduction Fund Post to discussion board | 13 Nissenbaum, Ch.7: Forest and Mineral Resources (pptx) | 14 - Weekly Discussion Posting or Sustainability in the News - Upload of Sustainability Portfolio | 15 |
| 16 Week 14 | 17 - Individual student questions/comment to each Sustainability Portfolio group | 18 - Individual student questions/comment to each Sustainability Portfolio group | 19 - Individual student questions/comment to each Sustainability Portfolio group | 20 - Sustainability Group: respond to posted questions/comments | 21 - Sustainability Group: respond to posted questions/comments | 22 |
| 23 Week 15 | 24 EXAM 3 DUE BY 11:59PM | 25 Course Review – post questions on discussion board for feedback by 11:59pm April 29 | 26 Course Review – post questions on discussion board for feedback by 11:59pm April 29 | 27 Course Review – post questions on discussion board for feedback by 11:59pm April 29 | 28 Course Review – post questions on discussion board for feedback by 11:59pm April 29 | 29 |
| 30 | | | | | | |

| May 2023 | | | | | | |
|----------|--|----------|-------------------------------|----------|----------|----------|
| ◀ April | | | | | | June ▶ |
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| | 1 LAST DAY OF INSTRUCTION | 2 | 3 FINAL EXAM | 4 | 5 | 6 |

