

NRM 210 Principles of Sustainable Agriculture

3 credits

Offered spring semester - Tuesdays and Thursdays at 2:00 to 3:30 PM

Instructors – M Karlsson, M Zhang and G Finstad

Zoom link: <https://alaska.zoom.us/j/86112942860>

Phone number if needed for audio using Zoom: 669-900-6833 or 253-215-8782

Meeting ID: 861 1294 2860 - Passcode: 909006

Text: Toward Sustainable Agricultural Systems in the 21st Century (2010)
Committee on Twenty-First Century Systems Agriculture; National Research Council
978-0-309-14896-2 (relevant chapters will be posted and available to students on blackboard)

Course Description: Development of a basic understanding of sustainable agriculture concepts including exposure to economic, social, and environmental principles and ideas of sustainable agricultural practices. Agroecology is introduced as a backdrop for the development of sustainable techniques for soil, plant, and animal agriculture. The sustainable agriculture concepts and principles will be related to current issues such as population growth, resource use and availability, and changing social structures and preferences. Prerequisites: NRM 101.

Course Objectives: The student will develop a basic understanding of sustainable agriculture concepts and will be exposed to principles and ideas of sustainable agricultural practices. The development of sustainable techniques for soil, plant, and animal agriculture will be integrated and based on agroecology. The sustainable agriculture concepts and principles will be related to population growth, resource use and availability, changing social structures and preferences, and other current trends and issues.

Student Learning Outcomes: The student will at the end of the semester demonstrate a basic understanding of the concepts and principles of sustainable agricultural management in soil, plant, and animal contexts. Student Learning Outcomes include:

- 1) Ability to critically apply knowledge and integrate the science of sustainable agriculture with economic, social and environmental sustainability for agricultural practices in modern cultures and societies.
- 2) The development of a basic understanding of sustainability science in global and U.S. agriculture and an appreciation for the biological, physical and social sciences that make up sustainable agriculture.

Course Outline

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| <p>Week 1</p> <p>1/11</p> <p>1/13</p> | <p>Chapter 1 in TSAS* (p. 15-41) What is Sustainable Agriculture?</p> <ul style="list-style-type: none"> • Overview • Concepts and themes • Three legs of sustainable agriculture • Economic, social, and political context <p>Quiz 1 - Due 1/18 before 2:00 PM</p> | <p>Karlsson</p> |
| <p>Week 2</p> <p>1/18</p> <p>1/20</p> | <p>Chapter 2 in TSAS* (p. 43-82) Farming and Natural Resources</p> <ul style="list-style-type: none"> • Is organic agriculture the same as sustainable agriculture? <p>Chapter 9 in Resilient Agriculture: Cultivating food systems for a changing climate, p. 271-311. New Times, New Tools: Managing for Resilience.</p> <ul style="list-style-type: none"> • Agroecology <p>Quiz 2 - Due 1/25 before 2:00 PM Assignment I (covers materials in weeks 1 & 2) Lundberg Family Farms (p. 371-376) – Due 1/27 by 2:00 PM</p> | <p>Zhang</p> |
| <p>Week 3</p> <p>1/25</p> <p>1/27</p> | <p>Chapter 3 in TSAS* (p. 150-160, 163-164) Sustainable Animal Production Concepts</p> <ul style="list-style-type: none"> • Animal nutrition • Grazing management <p>Quiz 3 - Due 2/1 by 2:00 PM</p> | <p>Finstad</p> |
| <p>Week 4</p> <p>2/1</p> <p>2/3</p> | <p>Chapter 5 in TSAS* (p. 233-249) Sustainable Animal Production Concepts</p> <ul style="list-style-type: none"> • Animal welfare • Animal behavior <p>Quiz 4 - Due 2/8 by 2:00 PM</p> | <p>Finstad</p> |
| <p>Week 5</p> <p>2/8</p> <p>2/10</p> | <p>Chapter 5 in TSAS* (p. 233-249) Sustainable Animal Production Concepts</p> <ul style="list-style-type: none"> • Integrated livestock management system • Systems management • Ecological & sustainable livestock production systems <p>Quiz 5 - Due 2/15 by 2:00 PM Assignment II (covers material in weeks 3, 4 & 5) Brookview Farm (p. 366-370) & Goldmine Farm (p. 463-472) – Due 2/17 by 2:00 PM</p> | <p>Finstad</p> |

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| Week 6 2/15 2/17 | Chapter 3 in TSAS* (p. 83-96) Sustainable Soil Management <ul style="list-style-type: none"> • Conservation tilling • Cover cropping Quiz 6 - Due 2/22 before 2:00 PM | Zhang |
| Week 7 2/22 2/24 | Chapter 3 in TSAS* (p. 121-131) Sustainable Soil Management <ul style="list-style-type: none"> • Mass balance • Soil tests • Compost Quiz 7 - Due 3/1 before 2:00 PM | Zhang |
| Week 8 3/1 3/3 | Chapter 3 in TSAS* (p. 110-121) Sustainable Field Crop Production Concepts – Agronomy <ul style="list-style-type: none"> • Irrigation • Water quality management Quiz 8 - Due 3/8 before 2:00 PM | Zhang |
| Week 9 3/8 3/10 | Chapter 3 in TSAS* (p. 97-109) Sustainable Field Crop Production Concepts – Agronomy <ul style="list-style-type: none"> • Crop rotations • Intercropping • Cultivar mixtures Quiz 9 - Due 3/22 before 2:00 PM | Zhang |
| Week 10 | 3/14 through 3/18 Spring Break | |
| Week 11 3/22 3/24 | Reading Assignment: Sustainable Soil Management System Guide (available on Blackboard one week prior to class period) Sustainable Soil Management – Systems Management <ul style="list-style-type: none"> • Principles and characteristics of sustainable Soil • Management steps to improve soil quality • Examples of sustainable soil builders Quiz 10 - Due 3/29 before 2:00 PM Assignment III (covers material in weeks 6 - 11) Bragger Farm (p. 402-412) & Peregrine Farm (p. 445-452) – Due 3/31 before 2:00 PM | Zhang |
| Week 12 3/29 3/31 | Chapter 6 in TSAS* (p. 271-304) Sustainable Plant Production Concepts – Horticulture <ul style="list-style-type: none"> • Specialty crops production • Sustainable programs and certifications • Eco-labels and production systems Quiz 11 - Due 4/5 before 2:00 PM | Karlsson |

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| Week 13 4/5 4/7 | Chapter 7 in TSAS* (p. 362-365, 377-379) Sustainable Plant Production Concepts <ul style="list-style-type: none"> • Field production • Season extension techniques • Greenhouse production systems Quiz 12 - Due 4/12 before 2:00 PM | Karlsson |
| Week 14 4/12 4/14 | Chapter 6 in TSAS* (p. 135-150, 163) Sustainable Plant Production Concepts <ul style="list-style-type: none"> • Adaptive and integrated pest management • Concepts and definitions • IPM tactics and strategies Quiz 13 – Due 4/19 before 2:00 PM | Karlsson |
| Week 15 4/19 4/21 | Chapter 3 in TSAS* (p. 135-150, 163) Sustainable Plant Production Concepts <ul style="list-style-type: none"> • Biological IPM control methods • IPM for weed management Quiz 14 - Due 4/26 before 5:00 PM Assignment IV (covers material in weeks 12, 13, 14 & 15) Full Belly Farm (p.433-444) & Stahlbush Island Farms (p.453-462) – Due 4/28 before 5:00 PM | Karlsson |

*Towards Sustainable Agriculture Systems in the 21st Century.

Best way to do well in this class:

- 1) Attend the lectures,
- 2) Take good notes,
- 3) Read the assigned readings before class,
- 4) Download the PPT before or right after class,
- 5) Go back through your notes and the PPT soon after class, and
- 6) Complete take-home quizzes and the four case study assignments on time.

Course Grading:

Students will have weekly take-home quizzes. The quizzes will be available on Blackboard on Thursday and due the following Tuesday before 2:00 PM. Each quiz is worth 10 points for a total of 140 points.

There will also be four web-based case study assignments administered through Blackboard. Each assignment will cover topics since the previous assignment as well as build on materials presented throughout. Each assignment is worth 100 points for a total of 400 points. The students will have one week to complete each case study assignment from when available on Blackboard. Ten points will be deducted for each day an assignment is turned in late.

Class attendance and participation for a total of 140 points (5 points/class period).

| <u>Assignment #</u> | <u>Week of assignment</u> | <u>Week due</u> | <u>Points</u> |
|--|---------------------------|-----------------|---------------|
| I | End of Week 2 | End of Week 3 | 100 |
| II | End of Week 7 | End of Week 8 | 100 |
| III | End of Week 12 | End of Week 13 | 100 |
| IV | End of Week 15 | April 28 | 100 |
| Weekly take-home quizzes 14 quizzes | | | 140 |
| Class attendance and participation (5 points/class period) | | | <u>140</u> |

Total: 680 points

Final course grades will be assigned based on the following scale:

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|------------|------|---------------------|
| ≥ 97% | = A+ | ≥ 659 points |
| 92 - 96.9% | = A | 625 to 658.9 points |
| 90 – 91.9% | = A- | 612 to 624.9 points |
| 87 – 89.9% | = B+ | 591 to 611.9 points |
| 82 – 86.9% | = B | 557 to 590.9 points |
| 80 – 81.9% | = B- | 544 to 556.9 points |
| 77 – 79.9% | = C+ | 523 to 543.9 points |
| 72 – 76.9% | = C | 489 to 522.9 points |
| 70 – 71.9% | = C- | 476 to 488.9 points |
| Etc. | | |

Academic Honesty:

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 <https://www.uaf.edu/csrr/student-conduct/>

Notice of Nondiscrimination:

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

Support Services

Please consult the Student Handbook for topics 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 Help Desk.

Go to <https://www.alaska.edu/oit/> to see 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)

Student Protections and Services:

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. 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/>

All of us have strengths and weaknesses when it comes to learning. If you have a particular learning disability that may interfere with your ability to perform the work in this course, we are happy to make reasonable accommodations. Please obtain an Accommodation Letter from Disabilities Services (ext.5655, uaf-disability-services@alaska.edu). Accommodations will not be made retroactively (i.e. if you need additional time to complete the exams, you must present the letter *before* any exam is administered). We appreciate your cooperation.

For more information on your rights as a student and the resources available to resolve problems, please see the Student Handbook (<https://www.uaf.edu/handbook/>).

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?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 protections 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/>.

Disability services statement: We will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities.

Student Academic Support:

- Speaking Center (907-474-5470, uaf-speakingcenter@alaska.edu, Gruening 507)
- Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Gruening 8th floor)
- UAF Math Services, uafmathstatlab@gmail.com, Chapman Building (for math fee paying students only)
- Developmental Math Lab, Gruening 406
- The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120, <https://www.ctc.uaf.edu/student-services/student-success-center/>)
- For more information and resources, please see the Academic Advising Resource List (https://www.uaf.edu/advising/lr/SKM_364e19011717281.pdf)

Student Resources:

- Disability Services (907-474-5655, uaf-disability-services@alaska.edu, Whitaker 208)
- Student Health & Counseling [**6 free counseling sessions**] (907-474-7043, <https://www.uaf.edu/chc/appointments.php>, Whitaker 203)
- Center for Student Rights and Responsibilities (907-474-7317, uaf-studentrights@alaska.edu, Eielson 110)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119)

Nondiscrimination statement: The University of Alaska is an affirmative action/equal opportunity employer and educational institution. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of nondiscrimination available at www.alaska.edu/nondiscrimination. For more information, contact:

UAF Department of Equity and Compliance

1692 Tok Lane, 3rd floor, Constitution Hall, Fairbanks, AK 99775

907-474-7300

uaf-deo@alaska.edu