

## ***NRM 210 Principles of Sustainable Agriculture***

3 credits

Instructors – MG Karlsson, M Zhang, MP Shipka

Offered spring semester - T TH 2:00-3:30 PM

AHRB 183 and Online

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

**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. Throughout the semester, 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. Agroecology is introduced as a backdrop for the development of sustainable techniques for soil, plant, and animal agriculture. Throughout the semester, 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.

**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**

<b>Week 1</b> 1/15 1/17	Chapter 1 in TSAS* (p. 15-41) What is Sustainable Agriculture? <ul style="list-style-type: none"> <li>• Overview</li> <li>• Concepts and themes</li> <li>• Three legs of sustainable agriculture</li> <li>• Economic, social, and political context</li> </ul> <b>Quiz 1</b> - Due 1/22 before 2:00 PM	Shipka
<b>Week 2</b> 1/22 ----- 1/24	Chapter 2 in TSAS* (p. 43-82) Farming and Natural Resources <ul style="list-style-type: none"> <li>• Is organic agriculture the same as sustainable agriculture?</li> </ul> ----- Chapter 3 in TSAS* (p. 83-96) Sustainable Soil Management <ul style="list-style-type: none"> <li>• Conservation tilling</li> <li>• Cover cropping</li> </ul> <b>Quiz 2</b> - Due 1/29 before 2:00 PM <b>Assignment I</b> (covers material in week 1) Lundberg Family Farms (p. 371-376) – Due 1/31 by 2:00 PM	Shipka ----- Zhang
<b>Week 3</b> 1/29 1/31	Chapter 3 in TSAS* (p. 121-131) Sustainable Soil Management <ul style="list-style-type: none"> <li>• Conservation tilling</li> <li>• Cover cropping</li> </ul> <b>Quiz 3</b> - Due 2/5 before 2:00 PM	Zhang
<b>Week 4</b> 2/5 ----- 2/7	Chapter 9 in Resilient Agriculture: Cultivating Food systems for a Changing Climate New Times, New Tools: Managing for Resilience (P 271-311) <ul style="list-style-type: none"> <li>• Agroecology</li> </ul> ----- Sustainable Soil Management <ul style="list-style-type: none"> <li>• Mass balance</li> <li>• Soil tests</li> <li>• Compost</li> </ul> <b>Quiz 4</b> - Due 2/12 before 2:00 PM	Shipka ----- Zhang
<b>Week 5</b> 2/12 2/14	Chapter 3 in TSAS* (p. 110-121) Sustainable Field Crop Production Concepts – Agronomy <ul style="list-style-type: none"> <li>• Irrigation</li> <li>• Water quality management</li> </ul> <b>Quiz 5</b> - Due 2/19 before 2:00 PM	Zhang

<b>Week 6</b> 2/19 2/21	Chapter 3 in TSAS* (p. 97-109) Sustainable Field Crop Production Concepts – Agronomy <ul style="list-style-type: none"> <li>• Crop rotations</li> <li>• Intercropping</li> <li>• Cultivar mixtures</li> </ul> <b>Quiz 6</b> - Due 2/26 before 2:00 PM	Zhang
<b>Week 7</b> 2/26 2/28	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"> <li>• Principles and characteristics of sustainable Soil</li> <li>• Management steps to improve soil quality</li> <li>• Examples of sustainable soil builders</li> </ul> <b>Quiz 7</b> - Due 3/5 before 2:00 PM <b>Assignment II</b> (covers material in weeks 2 - 7) Bragger Farm (p. 402-412) & Peregrine Farm (p. 445-452) – Due 3/7 by 2:00 PM	Zhang
<b>Week 8</b> 3/5 3/7	Chapter 6 in TSAS* (p. 271-304) Sustainable Plant Production Concepts – Horticulture <ul style="list-style-type: none"> <li>• Specialty crops production</li> <li>• Sustainable programs and certifications</li> <li>• Eco-labels and production systems</li> </ul> <b>Quiz 8</b> - Due 3/19 before 2:00 PM	Karlsson
<b>Week 9</b>	<b>3/11 through 3/15                      Spring Break</b>	
<b>Week 10</b> 3/19 3/21	Chapter 7 in TSAS* (p. 362-365, 377-379) Sustainable Plant Production Concepts <ul style="list-style-type: none"> <li>• Field production</li> <li>• Season extension techniques</li> <li>• Greenhouse production systems</li> </ul> <b>Quiz 9</b> - Due 3/26 before 2:00 PM	Karlsson
<b>Week 11</b> 3/26 3/28	Chapter 6 in TSAS* (p. 135-150, 163) Sustainable Plant Production Concepts <ul style="list-style-type: none"> <li>• Adaptive and integrated pest management</li> <li>• Concepts and definitions</li> <li>• IPM tactics and strategies</li> </ul> <b>Quiz 10</b> - Due 4/2 before 2:00 PM	Karlsson
<b>Week 12</b> 4/2 4/4	Chapter 3 in TSAS* (p. 135-150, 163) Sustainable Plant Production Concepts <ul style="list-style-type: none"> <li>• Biological IPM control methods</li> <li>• IPM for weed management</li> </ul> <b>Quiz 11</b> - Due 4/9 before 2:00 PM <b>Assignment III</b> (covers material in weeks 8, 10, 11 & 12) Full Belly Farm (p.433-444) & Stahlbush Island Farms (p.453-462) – Due 4/12 by 2:00 PM	Karlsson

<b>Week 13</b> 4/9 4/12	Chapter 3 in TSAS* (p. 150-160, 163-164) Sustainable Animal Production Concepts <ul style="list-style-type: none"> <li>• Animal nutrition</li> <li>• Grazing management</li> </ul> <b>Quiz 12</b> - Due 4/16 before 2:00 PM	Shipka
<b>Week 14</b> 4/16 4/18	Chapter 5 in TSAS* (p. 233-249) Sustainable Animal Production Concepts <ul style="list-style-type: none"> <li>• Animal welfare</li> <li>• Animal behavior</li> </ul> <b>Quiz 13</b> - Due 4/23 before 2:00 PM	Shipka
<b>Week 15</b> 4/23 4/25	Chapter 5 in TSAS* (p. 233-249) Sustainable Animal Production Concepts <ul style="list-style-type: none"> <li>• Integrated livestock management system</li> <li>• Systems management</li> <li>• Ecological &amp; sustainable livestock production systems</li> </ul> <b>Quiz 14</b> - Due 5/2 before 5:00 PM <b>Assignment IV</b> (covers material in weeks 13, 14 & 15) Brookview Farm (p. 366-370) & Goldmine Farm (p. 463-472) – Due 5/1 by 5:00 PM	Shipka

\*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 UAF 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 the time it is available on Blackboard.

Ten points will be deducted for each day an assignment is turned in late.

<b><u>Assignment #</u></b>	<b><u>Week of assignment</u></b>	<b><u>Week due</u></b>	<b><u>Points</u></b>
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	May 1	100
Weekly take-home quizzes 14 quizzes			140
Class attendance and participation (5 points/class period)			<u>140</u>
			<b>Total: 680 points</b>

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

$\geq 97\%$	= <b>A+</b>	$\geq 659$ points
92 - 96.9%	= <b>A</b>	<b>625 to 658.9 points</b>
90 – 91.9%	= <b>A-</b>	<b>612 to 624.9 points</b>
87 – 89.9%	= <b>B+</b>	<b>591 to 611.9 points</b>
82 – 86.9%	= <b>B</b>	<b>557 to 590.9 points</b>
80 – 81.9%	= <b>B-</b>	<b>544 to 556.9 points</b>
77 – 79.9%	= <b>C+</b>	<b>523 to 543.9 points</b>
72 – 76.9%	= <b>C</b>	<b>489 to 522.9 points</b>
70 – 71.9%	= <b>C-</b>	<b>476 to 488.9 points</b>
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 Student Code of Conduct.

#### **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).

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

### **Student Protections and Services:**

Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: [www.uaf.edu/handbook/](http://www.uaf.edu/handbook/).

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, I am happy to make reasonable accommodations. Please obtain an Accommodation Letter from the Disabilities Office of the Health Center (ext.6158). Accommodations will not be made retroactively (i.e. if you need additional time to complete the exams, you must present the letter *before* any exams are administered). I 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://cms-test.alaska.edu/handbook/>