NRM 210 Principles of Sustainable Agriculture

3 credits
Instructors – MP Shipka, MG Karlsson, M Zhang
Offered spring semester - T TH 2:00-3:30 PM
Murie Auditorium 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

Week 1 1/16 1/18	Chapter 1 in TSAS* (p. 15-41) What is Sustainable Agriculture? • Overview • Concepts and themes • Three legs of sustainable agriculture • Economic, social, and political context **Quiz 1** - Due 1/23 before 2:00 PM	Shipka
Week 2 1/23 1/25	Chapter 2 in TSAS* (p. 43-82) Farming and Natural Resources • Is organic agriculture the same as sustainable agriculture? • Agroecology **Quiz 2** - Due 1/30 before 2:00 PM **Assignment I** (covers material in weeks 1 & 2) Lundberg Family Farms (p. 371-376) – Due 2/1 by 2:00 PM	Shipka
Week 3 1/30 2/1	Chapter 3 in TSAS* (p. 83-97) Sustainable Soil Management • Conservation tilling • Cover cropping **Quiz 3** - Due 2/6 before 2:00 PM	Zhang
Week 4 2/6 2/8	Chapter 3 in TSAS* (p. 122-131) Sustainable Soil Management • Mass balance • Soil tests • Compost **Quiz 4** - Due 2/13 before 2:00 PM	Zhang
Week 5 2/13 2/15	Chapter 3 in TSAS* (p. 110-122) Sustainable Field Crop Production Concepts – Agronomy • Irrigation • Water quality management **Quiz 5** - Due 2/20 before 2:00 PM	Zhang
Week 6 2/20 2/22	Chapter 3 in TSAS* (p. 97-110) Sustainable Field Crop Production Concepts – Agronomy • Crop rotations • Intercropping • Cultivar mixtures **Quiz 6** - Due 2/27 before 2:00 PM	Zhang

Week 7 2/27 3/1	Reading Assignment: Sustainable Soil Management System Guide (available on Blackboard one week prior to class period) Sustainable Soil Management – Systems Management • Principles and characteristics of sustainable Soil • Management steps to improve soil quality • Examples of sustainable soil builders **Quiz 7** - Due 3/6 before 2:00 PM **<u>Assignment II</u>** (covers material in weeks 3, 4, 5, 6 & 7) Bragger Farm (p. 402-412) & Peregrine Farm (p. 445-452) – Due 3/8 by 2:00 PM	Zhang
Week 8 3/6 3/8	Chapter 6 in TSAS* (p. 271-304) Sustainable Plant Production Concepts – Horticulture • Specialty crops production • Sustainable programs and certifications • Eco-labels and production systems **Quiz 8** - Due 3/20 before 2:00 PM	Karlsson
Week 9	**3/12 through 3/16 Spring Break**	
Week 10 3/20 3/22	Chapter 7 in TSAS* (p. 362-365, 377-379) Sustainable Plant Production Concepts • Field production • Season extension techniques • Greenhouse production systems **Quiz 9** - Due 3/27 before 2:00 PM	Karlsson
Week 11 3/27 3/29	Chapter 6 in TSAS* (p. 135-150, 163) Sustainable Plant Production Concepts • Adaptive and integrated pest management • Concepts and definitions • IPM tactics and strategies **Quiz 10** - Due 4/3 before 2:00 PM	Karlsson
Week 12 4/3 4/5	Chapter 3 in TSAS* (p. 135-150, 163) Sustainable Plant Production Concepts • Biological IPM control methods • IPM for weed management **Quiz 11** - Due 4/10 before 2:00 PM **<u>Assignment III</u>** (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
Week 13 4/10 4/12	Chapter 3 in TSAS* (p. 150-160, 163-164) Sustainable Animal Production Concepts • Animal nutrition • Grazing management **Quiz 12** - Due 4/17 before 2:00 PM	Shipka

Week 14 4/17 4/19	Chapter 5 in TSAS* (p. 233-249) Sustainable Animal Production Concepts • Animal welfare • Animal behavior **Quiz 13** - Due 4/24 before 2:00 PM	Shipka
Week 15 4/24 4/26	Chapter 5 in TSAS* (p. 233-249) Sustainable Animal Production Concepts • Integrated livestock management system • Systems management • Ecological & sustainable livestock production systems **Quiz 14** - Due 5/1 before 2:00 PM **Assignment IV** (covers material in weeks 13, 14 & 15) Brookview Farm (p. 366-370) & Goldmine Farm (p. 463-472) – Due 5/1 by 10:00 AM	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.

Assignment #	**Week of assignment**	**Week due**	**Points**
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
		Total:	**540 points**

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

≥ 97%	=	**A+**	**≥ 523 points**
92 - 96.9%	=	**A**	**496 to 522.9 points**
90 – 91.9%	=	**A-**	**486 to 495.9 points**
87 – 89.9%	=	**B+**	**469 to 485.9 points**
82 – 86.9%	=	**B**	**442 to 468.9 points**
80 – 81.9%	=	**B-**	**432 to 441.9 points**
77 – 79.9%	=	**C+**	**415 to 431.9 points**
72 – 76.9%	=	**C**	**388 to 414.9 points**
70 – 71.1%	=	**C-**	**378 to 387.9 points**
Etc.			

Grading policy information, 2017-18 catalog (http://catalog.uaf.edu/services/disability-services)

The Disability Services program, in 208 Whitaker, provides services to students with documented disabilities on the Fairbanks campus as well as the Bristol Bay, Chukchi, Interior Alaska, Kuskokwim, Northwest, and Community and Technical College campuses, Distance Education, and the College of Rural and Community Development. The goal of Disability Services is to ensure equal access to educational opportunities at UAF. Academic accommodations are free and available to any student who qualifies as an individual with a disability and is enrolled in at least 1 credit hour. Disability Services operates an assistive technology lab with specialized software. UAF has an accessible shuttle bus service equipped with a wheelchair lift for transportation on campus, and most campus buildings are accessible. For more information contact Disability Services at 907-474-5655 or 907-474-1827 (TTY), email uaf-disability-services@alaska.edu or visit http://www.uaf.edu/disability/.