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**Lecture:** MWF 3:00 – 3:50 pm  
TILT (The Institute for Learning and Teaching), Room 221

**Course Description:** This course will provide a foundation in population and community ecology, ecosystem science, and coupled natural and human systems. Elements of ecosystem science covered will include global and local patterns of ecosystem productivity and the cycling of water, nutrients and energy. The concept of ecosystem services will be introduced. The role of science in identifying, understanding, and responding to environmental challenges will be covered. Overarching questions in ecology and sustainability will guide discussions that touch frequently upon ecological fundamentals.

**Course Objectives:**

- To understand key fundamentals of population, community, and ecosystem structure, function, and services.
- To examine the importance of ecosystems to people and interactions humans have with the earth systems.

**Course Website:** Canvas

**Readings:** Our main resource will be:

Marten, Gerald G. 2001. Human Ecology: Basic Concepts for Sustainable Development. Earthscan, Abingdon, Oxon

Readings will be individual chapters from that volume, read in an order different than the author used. These readings will provide important background and context for the lecture material and

the examples that we use. Additional readings may be assigned and provided as PDFs on Canvas. We may discuss items in the readings that are confusing or with which we disagree. Students should consider three ways in which a paper related to a topic of interest and three things that were confusing. *Student readiness will be reflected in the participation portion of the course grading.*

**Class schedule (subject to change):**

Week	Date	Topic	Main reading	Lead
<b>Fundamentals of Ecosystem Science</b>				
<b>1</b>	Jan 16	<i>Holiday</i>		
	Jan 18	Introduction	Chapter 1	Boone
	Jan 20	Ecosystems and the environment		Boone
<b>Fundamentals of Ecosystem Science</b>				
<b>2</b>	Jan 23	Introduction to research methods		Boone
	Jan 25	Energy in ecosystems	Chapter 8	Boone
	Jan 27	Ecosystem services		Ojima
<b>Social-ecological Systems and Sustainability</b>				
<b>3</b>	Jan 30	Habitat selection and niches		Boone
	Feb 1	Consumption and sustainability		Ojima
	Feb 3	Air, water, food, and ecosystems		Ojima
<b>Species Occurrence</b>				
<b>4</b>	Feb 6	Water, energy, and biogeochemistry	Chapter 3	Ojima
	Feb 8	<i>Review of material</i>		Boone
	Feb 10	<i>Exam – Part A</i>		Boone
<b>Ecosystem Organization</b>				
<b>5</b>	Feb 13	Distribution of biomes	Chapter 5	Boone
	Feb 15	Allometrics and ecological organization		Boone
	Feb 17	Introduction to biogeography		Boone
<b>Ecosystems and Sustainability</b>				
<b>6</b>	Feb 20	Endangered species management and policy		Punzalan
	Feb 22	Energy and species richness		Boone
	Feb 24	Patterns of human settlement		Ojima
<b>Ecosystem Services</b>				
<b>7</b>	Feb 27	Ecosystems and food production	Chapter 4	Ojima
	Mar 1	Food production and sustainability		Ojima
	Mar 3	<i>Continued</i>		Ojima

**(Continued)**

**Class Schedule (Continued)**

<b>Example Livelihoods</b>				
<b>8</b>	Mar 6	Climate change basics	Chapter 12	Ojima
	Mar 8	<i>Review of Materials</i>		Ojima
	Mar 10	<i>Exam – Part B</i>		Ojima
<b>Spring Break</b>				
<b>9</b>	Mar 13	<i>Break</i>		
	Mar 15	<i>Break</i>		
	Mar 17	<i>Break</i>		
<b>Global Change</b>				
<b>10</b>	Mar 20	Climate change from ancient and modern perspectives	Chapter 2	Ojima
	Mar 22	Energy and trophic structures		Boone
	Mar 24	Ecosystem case-study: grasslands		Boone
<b>Ecosystem and Population Dynamics</b>				
<b>11</b>	Mar 27	Disturbance and recovery	Chapter 6	Boone
	Mar 29	Fire dynamics		Boone
	Mar 31	Ecological restoration		Boone
<b>Ecosystem Dynamics and Earth System Changes</b>				
<b>12</b>	Apr 3	Sustaining food and soil resources	Chapter 10	Ojima
	Apr 5	Global needs of 9 billion people		Ojima
	Apr 7	Ecosystem production and quality of life		Ojima
<b>Earth System Changes</b>				
<b>13</b>	Apr 10	Global change and society	Chapter 7	Ojima
	Apr 12	<i>Review of Material</i>		Boone
	Apr 14	<i>Exam – Part C</i>		Boone
<b>System Dynamics and Resilience</b>				
<b>14</b>	Apr 17	Invasive species		Boone
	Apr 19	Genetic diversity / Introduction to in-class activity		Boone
	Apr 21	In-class activity / Climate change		Boone
<b>Sustainable Human-ecosystem Interactions</b>				
<b>15</b>	Apr 24	System collapse and sustainability	Chapter 9	Boone
	Apr 26	Ancient collapses and modern landscapes		Boone
	Apr 28	Attributes of resilient systems		Boone
<b>Sustainable Human-ecosystem Interactions</b>				
<b>16</b>	May 1	Ecosystems revisited	Chapter 11	Boone
	May 3	Looking to the future, and reasons for optimism		Boone
	May 5	<i>Review of material</i>		Boone
<b>Final Exam</b>				
<b>17</b>	May 8	7:30 am - 9:30 am (Monday)		Boone

**Attendance Policy and Participation:** Students are encouraged to attend lectures regularly. Discussions and demonstrations in lectures will be critical for you to develop a deeper understanding of ecosystem science. Attendance will affect participation scores. If you are forced to miss a lecture, the visuals used will be posted informing you of what you have missed. However, those visuals will not include all the material presented or the discussions that were had during lecture. Students who miss a lecture are strongly encouraged to speak with us or classmates to see what may have been missed.

**Special Needs:** Any student who needs special accommodations or has special needs is encouraged to speak with us about those needs as soon as possible.

**Academic Responsibility:** All work in this course must be completed in accordance with the CSU academic honesty policy (<http://catalog.colostate.edu/front/policies.aspx>). Plagiarism or failing to meet the academic honesty policy in other ways will be reported and may result in loss of credit on assignments or dismissal from class, and must be reported to CSU authorities. By participating in this course, you agree to abide by the following honor pledge, "I will not give, receive, or use any unauthorized assistance in this course."

**Expectations of Us:** We will bring enthusiasm and experience in ecosystem science to our meetings, and strive to create an atmosphere of collaborative learning. We will have up-to-date lecture materials, and will use engaging examples in our class. Students have their own experiences and background. We will build off those, encouraging and appreciating an interdisciplinary approach to our work. We will strive to keep all students up-to-date on their class standing. We will be readily available to students, with our office doors commonly open, and by appointment if helpful.

**Expectations from You:** In addition to promptness, participation, attention to CSU student expectations, etc., we expect students to embrace the interdisciplinary nature of the course. People of different backgrounds and experiences learn from this course. Above all, if you have any difficulties in the class, *Speak with us* or find some other way to let us know, otherwise your difficulties may go unrecognized.

### **Need Other Help?**

CSU is a community that cares for you. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to <http://health.colostate.edu>. "Tell Someone" by calling 970-491-1350 to discreetly discuss your concerns (<http://safety.colostate.edu/tell-someone.aspx>).

**Methods of evaluation:**

*Class participation:* 15%

Students are expected to raise questions and join in discussions in class and laboratories.

*Class exercises:* 20%

Occasional class exercises will be used to explore issues and reinforce ideas.

*Midterm exams:* 15% each, of 3

Exams will address topics discussed in each course quarter.

*Final exam:* 20%

The exam will address topics throughout the course, with emphasis on the final quarter.

Final grades will be assigned using the CSU grading scheme that follows. Score ranges may be adjusted down (i.e., improving the average grade) if necessary, but the range will not be adjusted upward.

Grade	Score	Course Credit
A	93-100	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	70-76	2.0
D	60-69	1.3
F	0-59	0