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**Sustainability and Science**  
**SUST 203, Spring 2016**  
**3 credits**  
**University of South Dakota**

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**Instructor:**

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Office hours: Wednesdays and Fridays 11am-1pm or by appointment

**Course meeting times and location:**

Mondays, Wednesdays, and Fridays from 1pm-1:50pm in Beacom Hall room 244

**Course prerequisites**

None

**Course textbook**

*Sustainability Principles and Practice* by Margaret Robertson (ISBN 978-0-415-84018-7)

Additional course materials will be made available through the course Desire to Learn (D2L) site.

**Course overview**

Sustainability is an emerging field that seeks to address many of society's complex and interdisciplinary issues. Many people have different definitions of sustainability. I think of sustainability as asking the questions "What kind of world do we want?" and "How can we effect change to move towards that world?" Sustainability is often described as moving towards systems that are environmentally beneficial, socially just, and economically profitable both now and into the future.

Science offers a powerful way to learn about the world that can help us discover how the world works and how we can work to develop better systems to meet everyone's needs. Science is a *method* for understanding the world – not a set body of knowledge – that uses a systematic and logical approach to test and observe components of the physical world. In this course we will examine four, interrelated topics that impact the sustainability of the planet: climate change, ecosystem services, energy, and the built environment.

Because sustainability is often action oriented, there will be three distinct types of learning that I hope will happen in this course.

- We will learn about a range of sustainability issues (i.e. learn the "content").
- We will work in teams to apply the content to specific – often local – issues.
- We will do sustainability.

Therefore, we will be "examining," "evaluating," and "doing" sustainability.

### Desired learning outcomes

I have seven desired learning outcomes for this course. These learning outcomes span knowledge acquisition to application and integration of that knowledge to using that knowledge to effect change to learning how to be a more effective learner.

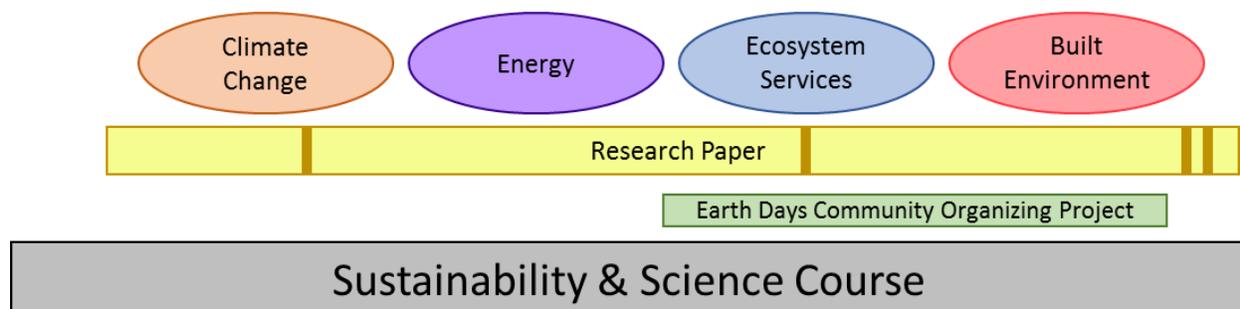
Learning outcomes	Type of learning	Assessments evaluating outcomes
Describe what climate change and ecosystem services are	Foundational knowledge	Quizzes
Describe how climate change, ecosystem services, energy, and the built environment are related to sustainability	Foundational knowledge	Quizzes
Utilize a systems-thinking approach in assessing sustainability topics	Application and Integration	Projects
Appraise group/team dynamics and personality styles better	Human dimension	Team-member evaluations
Identify an area of sustainability that you are passionate about	Caring	Research paper, Earth Week community organizing
Identify opportunities for how you can effect change	Learning how to learn	Earth Week community organizing
Identify appropriate sources of information for sustainability issues	Learning how to learn	Research paper

### Course structure

I will be using a strategy called team-based learning in this course. Team-based learning is centered on small-group learning where students gain foundational knowledge largely outside of class and use in-class time to apply the knowledge in teams. The structure of team-based learning courses is different from more traditional lecture courses. *Some students will find this type of course easier than lecture-based courses, while other students may find team-based learning to be more difficult.*

Because team-based learning emphasizes working in teams, a significant proportion of your grade will be determined by the scores that your team receives and feedback from your team members (see the “Assessments” section below for more information).

Below is a schematic of the general structure of the course. The course will be divided into four modules where we will discuss the interrelated topics of climate change, ecosystem services, energy, and the built environment. There will also be two projects that will be ongoing for most of the semester: the research paper (an individual project) and the Earth Days community organizing project (a group project). See the “Course schedule” section below for more information.



**Assessments:**

You will be assessed using a variety of methods. The tentative assessments and point totals are listed below. More detailed descriptions of the assessment are available on D2L.

Attendance (100% individual)	50 points
Quizzes (50% individual, 50% group)	70 points
Ecosystem services module assessments	20 points
Earth Days community organizing (30% individual, 70% group)	70 points
Projects (20% individual, 80% group)	150 points
Research paper (100% individual)	
Proposal	20 points
Annotated bibliography	20 points
Peer edits	20 points
Presentation	40 points
Final paper	100 points
Team-member evaluations (33% individual, 67% group)	30 points
Extra credit (per event) (100% individual)*	5 points
<b>TOTAL</b>	<b>590 points</b>

\*Because two of the goals of the course are to have you do sustainability and to have you identify which areas of sustainability you are most passionate about, you are allowed to get as much extra credit as you would like by attending sustainability-related events outside of class. See the “Extra credit description” document for more information about earning extra credit.

Grades for the course will be assigned using the following scale:

A (100-90%)	D (69-60%)
B (89-80%)	F (59-0%)
C (79-70%)	

No make-ups will be allowed for the individual and group quizzes unless you have made arrangements with me prior to the quizzes. Late assignments will not be accepted for the individual projects. Points will be deducted from other late assignments. Please talk with me about specific incidences for late assignments.

**Attendance:**

This is a team-based, discussion class. Therefore, your attendance is critical for maximizing your learning experience. If you will be missing a class, please inform me BEFORE the absence. You will be allowed **three absences** over the course of the semester. Beyond three absences, *ten points* will be deducted from your attendance grade for each absence (unless more than three absences are excused as described by the “Excused Absence Policy” – <http://link.usd.edu/243>).

**Diversity and Inclusive Excellence:**

The University of South Dakota strives to foster a globally inclusive learning environment where opportunities are provided for diversity to be recognized and respected.

**Academic integrity:**

The College of Arts and Sciences considers plagiarism, cheating, and other forms of academic dishonesty inimical to the objectives of higher education. The College supports the imposition of penalties on students who engage in academic dishonesty, as defined in the "Conduct" section of the University of South Dakota Student Handbook.

No credit can be given for a dishonest assignment. A student found to have engaged in any form of academic dishonesty may, at the discretion of the instructor, be:

- a. Given a zero for that assignment.
- b. Allowed to rewrite and resubmit the assignment for credit.
- c. Assigned a reduced grade for the course.
- d. Dropped from the course.
- e. Failed in the course.

I will also report the incident to the Office of Student Rights and Responsibilities.

**Freedom in learning:**

Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the dean of the college that offers the class to initiate a review of the evaluation.

**Disability accommodation:**

Any student who feels s/he may need academic accommodations or access accommodations based on the impact of a documented disability should contact and register with Disability Services during the first week of class or as soon as possible after the diagnosis of a disability. Disability Services is the official office to assist students through the process of disability verification and coordination of appropriate and reasonable accommodations. Students currently registered with Disability Services must obtain a new accommodation memo each semester.

Please note: if your home institution is not the University of South Dakota but one of the other South Dakota Board of Regents institutions (e.g., SDSU, SDSMT, BHSU, NSU, DSU), you should work with the disability services coordinator at your home institution.

Ernetta L. Fox, Director  
Disability Services, Room 119 Service Center  
(605)677-6389  
Web Site: [www.usd.edu/ds](http://www.usd.edu/ds)  
E-mail: [disabilityservices@usd.edu](mailto:disabilityservices@usd.edu)

## Course schedule

An up-to-date course schedule will be available on D2L.

Module	Date	Topic	Before class preparation
	11 Jan	Couse goals & introductions	
	13 Jan	Assign teams & syllabus quizzes	Read syllabus (S16 SUST 203 syllabus)
	15 Jan	What is sustainability	What is sustainability (pg. 3-8), A brief history of sustainability (pg. 10-20)
	18 Jan	No class – MLK Jr. Day	
	20 Jan	Personality styles, pre-course assessments, class projects	Do Big 5 personality test, read EDCO project description, read research paper description
	22 Jan	What is science & visioning	
	25 Jan	Lindsay Marlow guest lecture (meet in 323 ID Weeks Library)	Complete Library session 1 worksheet
Climate change	27 Jan	Climate change quizzes	Climate (pg. 73-90), <i>Cowspiracy</i> (documentary), <i>Extreme Realities</i> (documentary), IPCC 2014 Synthesis Report (article)
	29 Jan	Mark Sweeney guest lecture	
	1 Feb	Systems (ACPC introduction)	
	3 Feb	Systems thinking – modeling	
	5 Feb	Climate systems	Research paper proposal due
	8 Feb	Linda Black Elk guest lecture	
	10 Feb	Adapting to a changing world	
	12 Feb	Group project #1	
	15 Feb	No class – Presidents’ Day	
Energy	17 Feb	Energy quizzes	Project #1 reflection, Energy (pg. 158-180), <i>Switch</i> (documentary), <i>Boom! Behind the Bakken</i> (documentary), Powering the Future – Solutions (article)
	19 Feb	Carbon stabilization	
	22 Feb	Lindsay Marlow guest lecture (meet in 323 ID Weeks Library)	Complete Library session 2 worksheet
	24 Feb	Renewable energy & distributed generation	
	26 Feb	Jessica Lantgen guest lecture	
	29 Feb	TBD	
	2 Mar	Group project #2	
	4 Mar	EDCO project	Project #2 reflection
	7-11 Mar	No class – Spring break	
Ecosystem services	14 Mar	Mapping ecosystem services	Read ecosystem services introduction (PowerPoint), do ecosystem services worksheet, download Google Earth
	16 Mar	Exploring the hydrologic cycle	Do ecosystem services assessment PowerPoint, read watershed hydrology literacy (handout), do watershed literacy assessment worksheet
	18 Mar	Understanding perturbations to hydrologic systems	Plot Big Creek rainfall-runoff data
	21 Mar	Hydrologic impact of land use change	Research paper annotated bibliography due, do rainfall-runoff relationship assessment, EPA National

		Stormwater Calculator fact sheets (2), download National Stormwater Calculator
23 Mar	Mitigation using low impact development	
25 Mar	No class – Easter recess	
28 Mar	Using an ecosystem services approach to civic engagement	
30 Mar	Land use change and stakeholders	Formative team-member evaluations due, Celebrating and shaping nature (article), Mind mapping (video)
1 Apr	Position paper on proposed land use change	
4 Apr	Group project #3	
6 Apr	EDCO project	Project #3 reflection
8 Apr	Recycling facility & landfill tour (EXTENDED CLASS PERIOD – noon-2pm)	
11 Apr	Built environment quizzes	Green buildings and sites (pg. 183-205), Livable cities (pg. 208-220), <i>The Urban Explosion</i> (documentary), <i>Subdivided</i> (documentary)
13 Apr	Visioning results	
15 Apr	Campus sustainability	
18 Apr	<i>This Changes Everything</i> showing (7pm or 9pm at Vermillion Theater)	
20 Apr	Walkable cities, post-course assessments, course evaluations	<i>This Changes Everything</i> summary due, full draft of research paper due
22 Apr	Earth Day Fair (meet in the MUC)	
25 Apr	Earth Day reflection	EDCO reflection due
27 Apr	Group project #4	
29 April	Research paper presentations	Peer review of research papers due, research paper presentation due (for presenters), summative team-member evaluations due
3 May	Research paper presentations (Final exam period - 7:30am-9:30am)	Research paper presentation due (for presenters)
6 May	NO CLASS MEETING	Final research paper due by 5pm