Sustainability Learning Outcomes (SLO) Course & Curriculum Proposal Form
(please return to Deane.Wang@uvm.edu or lhill@uvm.edu)

Background and introduction to the SLO requirement

Four sustainability learning outcomes were approved by the UVM Faculty Senate in April of 2014. At that time a preamble providing the rationale for this requirement was part of the approved resolution. It is repeated here.

As stated in Our Common Ground, "The University of Vermont is an educationally purposeful community seeking to prepare students to live in a diverse and changing world." In the context of the emerging challenges of the 21st Century, this preparation includes envisioning and planning for a sustainable society. In addition, Our Common Ground speaks to "the transforming power of education." Thus UVM's vision for sustainability embraces the goal of educating all of its students to understand and contribute to the sustainability of human society. That is, we recognize that the pursuit of ecological, social, and economic vitality must come with the understanding that the needs of the present be met without compromising the ability of future generations to meet their own needs. Through its General Education Initiative, The University of Vermont will integrate its sustainability vision across curricular and co-curricular activities. Whatever their chosen discipline, each student will demonstrate their understanding of the defined learning outcomes in the knowledge, skills and values categories, as well as the personal domain.

Students who are prepared to address the challenges of creating a sustainable world have knowledge of current issues in sustainability and the social, ecological, and economic dimensions of these complex problems. With the knowledge gained through coursework from varied disciplines, students develop the skills to engage in rigorous and complex discussions around creating sustainable solutions. Coursework and experiences in sustainability are meant to widen social, historical, and cultural perspectives and strengthen students' ability to negotiate multiple values that routinely come into play when planning for sustainability at the local, regional or global scales. Students connect conceptual learning to challenges and opportunities in the world outside of the university classroom by critically analyzing their own experiences in order to make sustainability meaningful and guide their personal actions.

Please provide three components as part of your proposal submission:

1. Background/explanation: a brief history of the course/curriculum, general reasons why the course satisfies the Sustainability Learning Outcomes (SLO), and any other contextual information that can assist the committee in its review process.
2. Completed SLO table (see below).
3. Most current version of your course syllabus (syllabi in the case of a curriculum)

The SLO table will allow you to describe how your course/curriculum meets each of these outcomes. For each SLO, please indicate the level of exposure that you plan to incorporate in your teaching. The level of exposure to the learning outcome can be variable. The Committee seeks some level of exposure to all four (4) sustainability learning outcomes (SLOs). It is also expected that for three (3) of the outcomes, the level of exposure will at least be to "reinforces." A brief description of these expectations follows:

- **Introduces** indicates that the course objective is to familiarize students with the learning outcome so they can define terms. For example, the student has been exposed to some applications of the topic/concept through a lecture and/or reading. Other educational frameworks used to organize learning levels may use language like "fundamental" and "factual," imparting the ability to remember and understand.
- **Reinforces** indicates that the course objective will follow up the introduction of topic(s) with student work to apply the topic/concept themselves, either in a personal domain or that of organizations, institutions, municipalities, etc. This might include critical reflections, case studies, or laboratory exercises. The readings and related assignments should be substantive. Other educational frameworks may use language like "intermediate" and "conceptual," imparting the ability to apply and analyze.

- **Mastery** level is NOT an expectation for sustainability learning outcomes associated with a single first course addressing sustainability. However, if you feel that the course work provided in your course attains this level, we would like to value that learning outcome. This level might entail educational concepts like "advanced" and "procedural." Students would be able to evaluate and create in the context of these learning outcomes.

Activity title/type, lecture or activity, content, topics taught, etc.

Here we would like to know what type of activity is relevant to achieving the sustainability learning outcome. Is it lecture, an assignment, a service-learning projects, journal assignment, class exercise like a debate, etc.? If you title this activity, please include that here as well (e.g. "sustainability blog"). If there are associated topics, please also include these (e.g. "renewable energy, environmental justice, homeostasis"). If multiple teaching approaches are employed, please them.

Description of the activity and how it addresses the UVM SLO

Please explain your approach to achieving the sustainability learning outcome. This might start with a more detailed description of the activity followed by a discussion of how the learning outcome results from this learning activity. In some cases it will be self-evident, so the description of the activity will suffice. This section provides the most useful material for the committee to evaluate your sustainability learning outcome, so adequate detail will be helpful. The committee's goal is to encourage the development and expansion of sustainability-related curricula, but we need enough detail to carry out our responsibility. We encourage and invite faculty to communicate with the co-chairs of the committee if you need assistance with this process or have questions.

If any assessment methods will be used to demonstrate student learning, please include a brief description. We may request your specific assessment as it could help other faculty to develop similar methods for their course. The committee would also like to encourage faculty professional development around implementation of these sustainability outcomes, and sharing of faculty tools and approaches is an important part of the process.

Title of Course: Human Health and the Environment (ENVS/HLTH/NR 107)

Submitted by: Christine Vatovec

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Background/explanation: This cross-listed course serves as an elective and typically attracts ENVS students who are interested in pursuing a concentration in "environment and health," as well as nursing students who are required to take an environmental course. I began teaching this course in the fall of 2013 after participating in the Sustainability Faculty Fellows program, and therefore designed the course with sustainability as a central theme. As you will see below and in the attached syllabus, I begin the course by situating "health" within the context of sustainability through active dialog that allows students to formulate definitions and metrics for these terms that we return to throughout the course to measure how well we think any given action supports "health" and "sustainability." We next move through a series of environmental health methods and paradigms which includes discussion of vulnerable populations and environmental justice and provides students with tools for examining cultural factors that govern who gets the "goods" and who gets the "bads" with regard to environmental health challenges (e.g. hazardous waste facilities are disproportionately sited in communities of color, which also have historically had poor access to healthcare). From this framework of definitions, methods, and paradigms of environmental health, we next explore the environmental agents of disease (i.e. physical, chemical, and biological hazards) as well as health-promoting environments. In this section of the course, we explore case studies that have direct applicability to questions of sustainability—radiation sickness as experienced by people who have returned to the Chernobyl area; chemical hazards that result from our consumer society (e.g. endocrine disruptors); and biological hazards of emerging economies (e.g. Ebola, malaria) in comparison to those of industrialized nations (e.g. "mad cow" disease). We wrap-up the first half of class with an overview of tools for responding to and managing environmental health challenges, including risk assessment, communication, regulation and policy tools, and the precautionary principle.

The second half of the semester is focused on students working in small groups to apply the knowledge they gained in the first part of the course to current environmental health challenges. We move through a series of topics to assess the health outcomes (and their embedded sustainability outcomes) of various pathways and alternatives (producing energy; climate change; food and agricultural production; waste; injuries and occupational health and safety). Finally, we conclude the course both by wrapping-up our collective thoughts on opportunities to move forward as a society built upon "health" at both the individual and community level, and how such a society would influence our collective goal of "sustainability" on both local and global levels. Therefore, sustainability is a foundation of this course, and students have several opportunities throughout the course of the semester to learn and apply knowledge in a way that I hope engages them in becoming more ecologically-minded global citizens.

SLO #1: Students can have an informed conversation about the multiple dimensions and complexity of sustainability. (knowledge category)
Level of exposure: ____Reinforces_____

Activity title/type, lecture content, topics taught, etc.	**Description of the activity and how it addresses the UVM SLO and any assessment methods used to demonstrate learning (if applicable).**
First lecture period and follow-up activities: defining health as a component of sustainability	In the first lecture of this course, I introduce the concept of "human health and well-being" as a primary component of sustainability. We work on a "defining health" activity where students view a series of images and quotes directly related to "health" and "sustainability" and then each student develops a list of the key factors they think constitute health through a sustainability lens. We then break into small groups to create definitions of health via sustainability, groups share these definitions and we work collectively to sift and winnow the components of our statements until we come to general consensus on a shared definition of health via sustainability. We continue to return to this working definition throughout the course as a metric by which we critique the outcomes (i.e. health, environmental, social, and economic) of various activities. Reading (in class): WHO Ten facts on health impact of environment Assessment: students must integrate "sustainability" into their written reflections on four "sustainable well-being challenges"

SLO #2: Students can evaluate sustainability using an evidence-based disciplinary approach and integrate economic, ecological, and social perspectives. (skills category)
Level of exposure: ___Reinforces _____

Activity title/type, lecture content, topics taught, etc.	**Description of the activity and how it addresses the UVM SLO and any assessment methods used to demonstrate learning (if applicable).**
Environmental health book club assignment	Each student selects one of the following five book options to read, discuss as a member of an in-class book club, and write a review of to complete this assignment. o Life Exposed (Petryna; Chernobyl) o Toxic Bodies (Langston; endocrine disruptors) o Deceit and Denial (Markowitz & Rosner; lead) o Six Modern Plagues (Walters; biological hazards) o Last Child in the Woods (Louv; nature-deficit disorder) Following two mini-lectures that focus specifically on identifying economic, ecological, and social aspects of environmental health challenges, students will work with their book club groups in class to identify and discuss these various components of their selected books. We then use a jigsaw approach to regroup such that each student will need to succinctly review and reflect upon the book they read to a group of students who selected a different book to read. Thus, students have the opportunity to hear the key concepts from each of the books, while also getting a trial-run to formulate their book review. Students then write their review, including answers to specific prompts that offer to tease out the economic, social, and ecological aspects of the environmental health challenge. Assessment: written book review characterizing the social, economic, and ecological aspects of an environmental health challenge.

SLO #3: Students think critically about sustainability across a diversity of cultural values and across multiple scales of relevance from local to global. (values category)
Level of exposure: ___Reinforces_____

Activity title/type, lecture content, topics taught, etc.	**Description of the activity and how it addresses the UVM SLO and any assessment methods used to demonstrate learning (if applicable).**
Applications for the environmental health sciences ○ Producing energy ○ Climate change ○ Food and agricultural production ○ Waste	Each week during the second half of the semester, we focus on a different case study that has direct applicability to the environmental health sciences. Students read both textbook selections and articles related to the specific case study, discuss the case in small groups using discussion prompts that I provide, and then we engage in a full class discussion. Specific examples of the material covered includes (but is not limited to) the following material: - Producing energy: various perspectives on the health hazards of fracking; air pollution in industrializing cities - Climate change: "Sun Come Up" film (climate refugees); additional reading: Patz (2004) Health effects of climate change. *JAMA.* - Food and ag: food deserts; problems of over- and under-nourishment; health outcomes of conventional/monoculture vs. alternative/polyculture agriculture - Waste: revisiting Annie Leonard's "Story of Stuff;" human and wildlife health outcomes of PPCPs in surface waters; additional reading: Phillips (2011) Combined sewer overflows. *Environmental Science & Technology*. Assessment: Weekly "attendance and engagement" low-stakes writing response to a prompt regarding how the week's topic is relevant to our local community AND on a global scale.

SLO #4: Students, as members of society, can recognize and assess how sustainability impacts their lives and how their actions impact sustainability. (personal domain)
Level of exposure: ___Reinforces_____

Activity title/type, lecture content, topics taught, etc.	**Description of the activity and how it addresses the UVM SLO and any assessment methods used to demonstrate learning (if applicable).**
The great "sustainable well-being" challenge	In Lecture 1 when introducing the interconnections between health and sustainability (see 1 above), we view Nic Marks' TED Talk, "The Happy Planet Index." In his talk, Marks suggests that happiness research shows there are five practices that make people "happy" and "don't cost the planet": social connections, physical activity, lifelong learning, helping others, and mindfulness. Through class discussion and mini-lecture I distill four "challenges" based upon these practices as components of the World Health Organization's definition of health, "a sense of complete **physical**, **mental**, and **social** well-being…" Assessment: Over the course of the semester, students create, implement, and provide written reflection upon a series of personalized "sustainable well-being challenges" including physical activity (physical health), mindfulness (mental health), helping others (social health), and a miscellaneous physical, mental, or social challenge of their choosing. For each challenge, students will post their personal goal as part of a BB discussion, and write a reflection on BB discussing their experience. Specific focus will be given to how the experience related to sustainability (i.e. how was the students' health changed in relation to their ecological footprint?)

HUMAN HEALTH & THE ENVIRONMENT
HLTH/NR/ENVS 107
FALL 2015

Professor Christine Vatovec, PhD
Office Hours: By appointment
Office: 303C Aiken Center
cvatovec@uvm.edu

Course meets: Mondays 12:00 – 3:00 pm
115 Harris Hall

Purpose/Course Description

This course offers an introduction to the field of "environmental health." We will begin our collective work by situating environmental health within the context of sustainability—specifically, the idea that sustainability is achieved by creating a balance between ecological flourishing and human well-being, and that health is a primary component of well-being. Building upon this foundation, we will next cover a range of traditional environmental health topics including the methods of environmental health science (toxicology and epidemiology), environmental hazards (physical, biological, and chemical), risk analysis, communication and management, vulnerable populations, and precautionary approaches and environmental health regulations. Finally, we will apply the knowledge gained during the first half of the semester to understanding and identifying opportunities for mitigating a variety of current environmental health challenges including climate change, food production and access, energy production, water quality and access, and waste management. We will conclude the semester with a discussion of how we, as a society, may best achieve healthy lifestyles and healthy communities that are supportive of the ecological systems upon which our health depends.

Goals of the course

- Introduce students to the field of environmental health
- Provide students with resources for investigating their own environmental health-related interests
- Familiarize students with a range of environmental health career options

Student Learning Outcomes

At the conclusion of this course, students will be able to:

1. Discuss current environmental health challenges occurring at local, regional, and global scales.
2. Describe several environmental health hazards, routes of exposure, health effects, and mitigation options.
3. Critically examine environmental health-related news.
4. Engage sustainability science approaches and systems thinking to describe the interplay between human behaviors, environmental challenges, and human health and well-being.

Course materials

- Maxwell, N.I. (2014). Understanding environmental health: how we live in the world (second edition). Burlington, MA: Jones & Bartlett.
- iClicker or iClicker app (please make sure your iClicker is registered before our second class on September 14th.
- One "book club" book of your choosing – see the list on Blackboard to select a book.

Assignments & Assessment

	Possible Points to Earn
Attendance & Engagement (total of 10, 2 points each)	20
Reading comprehension (total of 12, 5 points each)	60
Group News critique (10 points group presentation, 10 points group member review)	20
Reflections on "Sustainable well-being challenges" (4 reflections, 5 points each)	20
Book Club and Review	20
Final Take-home Exam	40
TOTAL	**180**

Final grades will be assigned as follows (there is no curve in this class):

A+ 98-100%	B- 80-82%	D 63-67%
A 93-97%	C+ 78-79%	D- 60-62%
A- 90-92%	C 73-77%	F below 60%
B+ 88-89%	C- 70-72%	
B 83-87%	D+ 68-69%	

Attendance & Engagement: This class meets a total of 13 times over the course of the semester. I will take attendance and ask you to write a brief response to a question during 10 of these class meetings. Your written response will constitute your attendance and engagement grade, with a maximum of 2 points available for each week's response.

Grading criteria:
2 points = response is clear, concise, and appropriately addresses the question
1 point = response is unclear and/or does not appropriately engage with the question
0 points = poor or no response/did not attend

Reading comprehension: Each week before coming to class, you will be expected to complete the assigned reading and come prepared to answer multiple choice questions about the reading using an iClicker. Correct answers will receive full credit, incorrect answers receive no credit.

Group News Critique: Becoming a responsible, ecologically-minded citizen includes knowing how to critically interpret the news you read every day. The aim of this assignment is to help you learn how to evaluate news articles you find in the popular press by examining the science behind the media.

1. On September 14 (our second day of class), we will select working groups with ~ 5 students each; this will be your peer group for the semester. We will also select a date for each group to present a current environmental health news story that is relevant to that day's topic.
2. The week before your group's News Critique presentation, work with your group to select a current news article (i.e. within the past month, or so). Suggested sources: environmentalhealthnews.org, Newsweek, New York Times, NPR, Burlington Free Press, CNN, APHA news, etc. Next, find the scientific article that the news article is based on and read it thoroughly.
3. Create a PowerPoint presentation that includes:
   SLIDE 1: An overview of the news story including details on what the story is about, who is involved, when and where events occurred, and why the story is important and relevant to our class.
   SLIDE 2: Provide prompts that will aid in a class discussion about this news. Where applicable, prompts may ask the audience to question the material presented, and challenge assumptions they may have about the

material.

SLIDE 3: Provide an overview of the scientific article and critique how accurately the popular press portrayed the research.

4. During the designated class time, you will share your presentation of your group's chosen news article and lead a short discussion with the class.

Grading criteria: 10 points for the quality of the presentation and discussion + 10 points as assessed by your group members' ratings of your participation (via a written scoring sheet)

Reflections on "Sustainable well-being challenges": On the first day of class, we will discuss definitions of "health" within a context of "sustainability," focusing on the interplay between human behaviors, environmental outcomes, and human health. Over the course of the semester, you will complete 4 "sustainable well-being challenges" that will require you to set a personal challenge for yourself and write a reflection on your experience of that challenge and how it relates to health and sustainability.

Grading criteria: Each written reflection will be worth 5 points based upon the quality of your reflection and level of engagement in completing the challenge.

Book Club and Review: Select one of the listed books to read, discuss with class members, and write a formal review of including a brief overview of the environmental health challenge presented, the most vulnerable populations, and potential points of intervention. More information including grading criteria to follow.

Final Take-home Exam: The final exam is worth 40 points and will include traditional testing formats (multiple choice, True/False, short answer, essay, etc.). The exam will cover readings, in-class discussion, and lecture material.

Course Policies and Guidelines

Lectures: If you arrive to class on time, I'll make sure I end class on time. If you miss class it is *your responsibility* to avail yourself of the material you missed. Unexcused absences will factor into your attendance & engagement grade.

Cell phones, laptops, and other distractors: I value our classroom time together highly. I find that cell phones, laptops, and other screen-based devices detract from classroom discussions and learning (the temptation to "multi-task" is just too high given wireless internet connectivity) and therefore *the use of these devices is* only *permitted in the classroom during specific times when I will guide our use of these technologies to support our collective learning.*

Late Assignments: Course work is due at the time assigned in the course syllabus. Late work will only be accepted if you contact me ahead of time to discuss a legitimate reason for why the assignment will be late (e.g. serious illness, life event, etc.).

Academic Integrity: All students are expected to follow the University's guidelines on academic integrity, available at http://www.uvm.edu/policies/student/acadintegrity.pdf. Academic dishonesty, such as plagiarism, will not be tolerated.

Accessibility: Please let me know as soon as possible if you have any special needs that I can address to make it possible for you to fully participate in this course. Any student with a documented disability interested in utilizing accommodations should contact ACCESS, the office of Disability Services on campus. ACCESS works with students to create reasonable and appropriate accommodations via an accommodation letter to their professors as early as possible each semester. Contact ACCESS: A170 Living/Learning Center; 802-656-7753; access@uvm.edu; or www.uvm.edu/access

Note: the material in this syllabus is subject to change.

Course Schedule

		Topic	Textbook reading (pages)	Assignment Due
August	31	Introduction to "environmental health" within a context of sustainability; envisioning health promoting environments	1 - 4	
September	7	LABOR DAY – NO CLASS		
		Methods and paradigms of environmental health science		
	14	• Toxicology • Epidemiology • Vulnerable populations, environmental justice, community based participatory research	5 – 52 + PDF on BB	Sustainable well-being challenge #1
		Identifying environmental agents of health-degrading and health-supporting environments		
	21	Physical hazards (energy) • Ionizing radiation • Non-ionizing radiation	71; 106 – 118, 335 - 337	
	28	Chemical hazards • Organic toxins (pesticides) • Inorganic toxins (heavy metals)	193 – 211, 219 – 220, 240 – 247, 331 – 335	Sustainable well-being challenge #2
October	5	Biological hazards • Infectious diseases • Allergens	71-104, 258 - 262	
	12	Built environment and nature contact	PDF on BB	Book club discussion prompts
		Responding to and managing environmental health hazards		
	19	Risk assessment & communication, preventive approaches, and regulation	52 – 70, 310, 320, 339 - 342	Book Review
		Applications for the environmental health sciences (NOTE – check BB for additional readings)		
	26	Producing energy	119 – 191, 315 – 316	
November	2	Climate change & environmental disasters	104 - 106, 143 – 151, 264	Sustainable well-being challenge #3
	9	Food • Agricultural production • Food & nutrition	237 – 283	
	16	Waste (solid & liquid)…and water	221 – 236, 285 – 322	
	23	THANKSGIVING RECESS – NO CLASS		
	30	Injuries…and health & safety in the workplace	211 – 221, 337 - 339	Sustainable well-being challenge #4
		Living in the environment we have made		
December	7	Healthy lifestyles, healthy communities	322 – 329, 342 - 352	
December	TBD	FINAL EXAM in 115 Harris		