



UCSC SUSTAINABILITY STUDIES MINOR PROGRAM LEARNING OUTCOMES

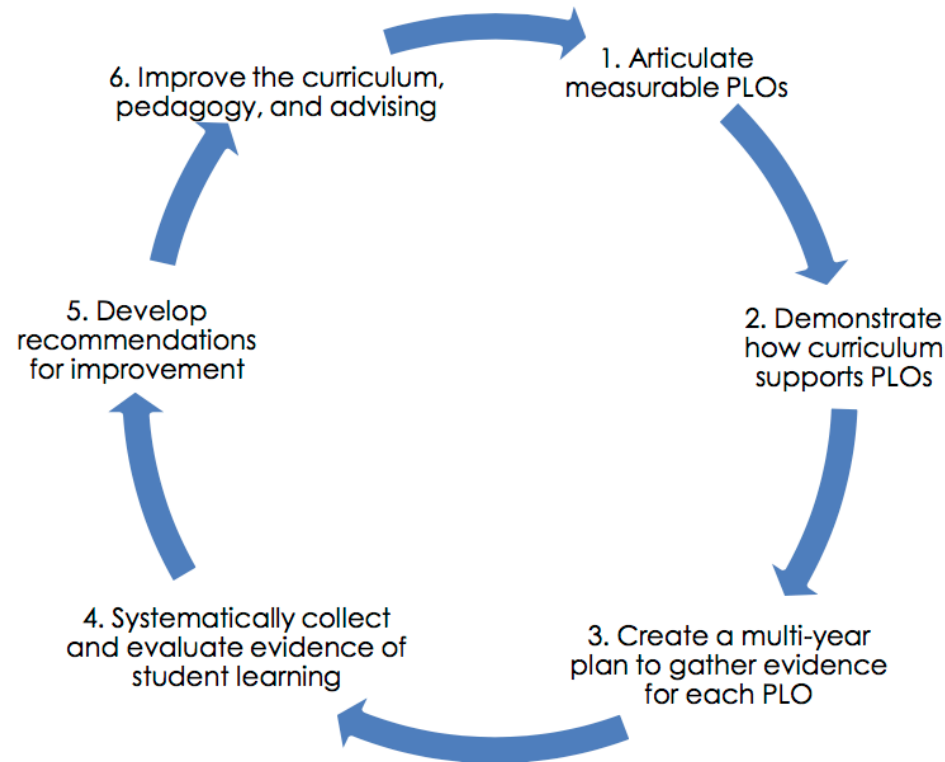
Abstract

An overview of the Sustainability Studies Minor (SSM) program designed as a resource for students, faculty, and staff at UCSC. This document expresses the programs qualitative goals, and translates them into student learning outcomes, contextualizing them within specific courses. It is intended to provide vision and cohesion for program stakeholders, as well as offer detail and instruction for longitudinal program assessment.

UCSC SUSTAINABILITY STUDIES MINOR PROGRAM LEARNING OUTCOMES

Written by Emelia Michel, June 2017, for the Provosts Sustainability Internship Program.
Thanks to mentors & editors Ronnie Lipschutz and Tamara Ball.

This document is designed for the Sustainability Studies Minor Program (SSM) at University of California, Santa Cruz by the 2017 program intern. It is intended to help the SSMs present and future campus stakeholders. For students, it will clarify the pedagogy of their instructors, help them to integrate topics and learned skills across courses in the program, and summarize the educational goals of the program for them to compare against their own educational goals. For staff and faculty, to develop an assessment framework the newly established Sustainability Studies Minor program.



A Systematic Approach to Assessment. (2013). University of California Santa Cruz: Guidelines for the Development and Assessment of Program Learning Outcomes (p.3). Retrieved from: <http://mediafiles.ucsc.edu/iraps/assessment/plo-guidelines.pdf>

Lower Division Courses

- EE80S**
Fall, 5 units
Required
- CRSN 55**
Sustainability Internship
Fall, 2 units
- CRSN 55**
Sustainability Internship
Winter, 2 units
- CRSN 55**
Sustainability Internship
Spring, 2 units

Upper Division Courses

- CRSN 151A**
Practicum
Winter, 5 units
- CRSN 151B**
Professionalization
Spring, 5 units
- CRSN 151C**
Lab Training
Fall, 5 units
- CRSN 161**
ESLP
Spring, 5 units

Elective Track #1

Elective Track #2

- Breadth Elective**
5 units
- Breadth Elective**
5 units
- Breadth Elective**
5 units
- CRSN 152 S-Lab LITE**
Fall, 2 units
- CRSN 152 S-Lab LITE**
Winter, 2 units
- CRSN 152 S-Lab LITE**
Spring, 2 units

PROGRAM GOALS *PROGRAM LEARNING OBJECTIVES*

Interdisciplinary Knowledge: Student will understand the features, data, and complexities of both causes of and solutions to the contemporary global socioecological crisis, including the role of markets, politics and policies, practices of production and consumption, behaviors in this crisis.

Student demonstrates knowledge of features, complexities, policies and practices, data and 'interdisciplinary knowledge' relevant to sustainability studies and sustainability science.

Communication and Action: Student will recognize and communicate the complex causes and implications of social & environmental problems, identify options and alternatives for moving toward and achieving sustainability, and pursue appropriate actions, in writing and speaking.

Student can analyze, apply, articulate and engage with 'interdisciplinary' knowledge to communicate, through writing and speaking, complex sustainability issues

STEM Skills: Student command of **basic STEM skills** needed for dealing with real-world sustainability issues and applications including assessments, measurements, technologies, behavior and other factors related to P.G.s

Student can identify need for and apply STEM analysis, research methods, and technological literacy to diverse problems, and situations related to sustainability.

Social Science Skills: Student command of diverse and appropriate **social science knowledge and methods** needed to design and implement social enterprise and service learning projects, particularly focusing on sustainability and ecological design and practice.

Student can identify need for social science skills across a range of disciplines and apply them to policy and analysis solutions across diverse sustainability-related projects

Project Design: Student will learn to design and conduct interdisciplinary research projects in issues and topics related to sustainability and ecological design & practice, including how to fund & implement social enterprise and service learning projects.

Student can apply interdisciplinary research and design skills and knowledge to develop policy solutions to complex sustainability issues, locally, nationally, and globally, and create projects, programs, and enterprises to address them.

Collaboration: Student will develop collaborative skills such as entrepreneurship, project management, and interdisciplinary communication.

Student fosters civic engagement and stewardship through collaboration with on- and off-campus units, agencies and organizations.

Curriculum Matrix

Program Learning Objectives (PLO's)

This table aligns the SSM's broad pedagogical goals with the specific program courses. It is a tool for students and faculty to examine the relationship between the programs goals and the reality of its curriculum. For students, it can identify areas where they will **practice (P)** and **demonstrate (D)** skills. For faculty, it is a tool to integrate separate courses in the program, and a reference to develop a method of portfolio-based program assessment based on **demonstrated (D)** skills. More information on the course specifics and course learning objectives used to construct this table can be found on the next page.

Courses

		Interdisciplinary Knowledge	Communication and Action	STEM skills	Social science skills	Project design	Collaboration
EE 80S	Sustainability Engineering & Ecological Design	P	P		P		P
CRSN 55	Sustainability Internship				P	P	P, D
CRSN 151 A	Sustainability Praxis in the Built Environment	P	P		P	P	P, D
CRSN 151 B	Innovation & Professionalization	P	P			P, D	P
CRSN 151 C	Sustainability Lab tools, techniques & applications	P	P	P, D			
CRSN 161	Education for Sustainable Living (VARIES)				P	P	P, D
CRSN 152	S-Lab Project Design/ Development			P		P	P

COURSES		
Course Goals	Course Learning Objectives	Course Requirements
EE 80s: Sustainability Engineering & Ecological Design		
<ul style="list-style-type: none"> •Introduction to basic scientific, engineering and social principles in the design, deployment, and operation of resource-based human systems, and how they can be maintained for this and future generations. •Introduction to basic methods of estimation, probability, risk and numeracy •Understanding of basic concepts related to sustainability engineering and ecological design (SEED) 	<p>Student will</p> <ul style="list-style-type: none"> •understand and explain complex sustainability, environmental, and ecological issues based on quantitative and qualitative tools and metrics •contextualize that knowledge laterally (across systems) and longitudinally (through time) •be comfortable with and able to apply SEED principles •assess, estimate, and describe magnitudes and risks associated with resource and human stocks and flows 	<ul style="list-style-type: none"> •Series of required lectures on topics relevant to sustainable engineering and design •Weekly required lab (discussion sections) •Weekly online quizzes, in-class problem sets on lecture and reading topics •Team research project to address a specific problem studied in class •Final exam
CRSN 55: Sustainability Internship		
<ul style="list-style-type: none"> •Introduction to concepts and practices of service learning and participatory action research (PAR). •Familiarize student with service-learning opportunities on campus and in the community. 	<p>Student will</p> <ul style="list-style-type: none"> •apply principles and practices of service learning in their internship placement •understand elements and implementation of PAR •acquire facility in the skills required for their specific placement 	<ul style="list-style-type: none"> •Site Reports (journals) •Work at the assigned internship site •Final paper, summary reflection and analysis paper on your service-learning experience •Final presentation
CRSN 151 A: Sustainability Praxis in the Built Environment		
<ul style="list-style-type: none"> •Learning how to analyze complex and “wicked” problems and issues •Learning how to prepare a sustainability policy analysis study •Identifying sustainability projects and the need for them •Applying (PLO 1) to understanding how energy, water, food, raw materials and waste flow through the human-built environment, with a particular concern for systemic and infrastructural relationships and how these manifest in those problems 	<p>Student will</p> <ul style="list-style-type: none"> •understand the basic aspects of systems and resource flows in the built environment, and an ability to conduct basic assessments/ quantification of these flows •understand social science aspects of human behavior, habits and practices where resource use is concerned •have a basic understanding of survey design and implementation (especially analytical tools & concepts) •develop the skills required to specify, organize, and conduct research projects under faculty supervision, •design, install and maintain monitoring equipment for ongoing sustainable systems research •understand, analyze, and communicate research data 	<ul style="list-style-type: none"> •Group policy papers •Group presentation •Fieldwork (hands-on development of sustainable systems on one of several group projects) Individual project assignments

CRSN 151 B: Innovation & Professionalization		
<ul style="list-style-type: none"> • Understand the organizational and practical foundations of designing a project, program or business, (needs and markets, mentoring and partnering, work plans, funding & proposal writing, human resources, evaluation). • Use the Business Model Canvas (BMC) to develop hypotheses and value propositions, identify audience/client/customer segments, and construct a project or enterprise plan. • Develop a business strategy to incubate the good or service, prepare business plans & proposals. • Learn professional skills appropriate to running a project or business, (interacting with audiences, customers and clients, developing presentation and speaking skills) 	<p>Student will</p> <ul style="list-style-type: none"> • demonstrate project and business literacy or project design and conduct (through individual or group project) • apply (BMC) methods to project plan • learn and develop professional skills (manage/interact with multiple stakeholders, presentation skills, collaborative skills, organizational skills) 	<ul style="list-style-type: none"> • Individual/group project: <ul style="list-style-type: none"> -Identification, research and planning -preparation of assigned materials -weekly revision of BMCs -minimum of 50 audience/customer/client interviews • Project or business plan: Draft & final • Final video: Two minute videos on projects & businesses • Final presentation: In-class presentations on projects & businesses
CRSN 151 C: Sustainability Lab Training		
<ul style="list-style-type: none"> • Introduce students to and bolster concepts, skills, and strategies fundamental to the successful development of sustainability-related projects appropriate to the “Sustainability Lab” 	<p>Student can understand and</p> <ul style="list-style-type: none"> • demonstrate good laboratory Environment, Health and Safety practice • use prototyping and fabrication tools • design sustainable power systems • use remote monitoring & control systems • apply principles of rainwater harvesting & water resource management 	<ul style="list-style-type: none"> • Completion of assignments • Attendance & completion of modules • Safety certification • Project presentations • Final project
CRSN 152: S-Lab Lite		
<ul style="list-style-type: none"> • Develop students as change agents, build professional networks through interdisciplinary team projects comprised of students, faculty mentors, and off-campus community stakeholders 	<p>Student will:</p> <ul style="list-style-type: none"> • obtain knowledge of key concepts, principles, and practices of solution-driven Sustainable Design • use quantitative reasoning and technology to design and/or test solutions to “wicked problems” • develop targeted communication skills (written, graphic, and audio-visual media) 	<ul style="list-style-type: none"> • participate in weekly log, weekly seminar, field trips & site visits, hold regular meetings with project mentors • Implement SCRUM-AGILE approach to project management • Development project-plan • Project support: <ul style="list-style-type: none"> -public outreach and presentation -develop presentation materials

	<ul style="list-style-type: none"> •learn how to develop, plan, and implement feasibility studies or assess performance and impacts; track and show evidence of project outcomes and impacts •acquire professional and applied skills (including project planning, developing a budget, time management, and project management) and create professional networks 	<p>-master skills, technology, tools as required by project objectives</p>
--	---	--

Methods of assessment:

Anonymized, program-wide portfolios (ecommons + clearinghouse)

Survey: Two part survey (to be designed), aimed at newly entered students and exiting students (longitudinal survey)

Features: disciplinary knowledge (STEM + social science), communication skills, professionalism, project skills

Direct: student capstones or projects, final reports and research, presentation opportunities

Indirect: student reported skill formation/development (survey)

college night collab
ssa collab
RCC sponsored event
Sustainability Office Sustainability Celebration
Giving Day (social media, email and phone outreach)
Newsletter1q
SEC: sec.enviroslug.org/college-eight-garden.html

PSI CONTACTS

RCC: Asako. Emily Davis

SLURP/RCC Affiliates: Kevin Bell. Thomas Rettenwender

Institute for Humanities Research: Whitney devos

Center for emergent ecologies: TJ Demos

Sue Carter

Allison Galloway

Blum

Everett

Pocsc

ENVS: Daniel press. Chris krone

POLITICS: Barbara laurence

SOCIOLOGY: Ben crow

Engineering: Pay many

ENVIROSLUG

SEC Carmen Gutierrez cgutier9@ucsc.edu

SO

IDEASS FACULTY

Mike Isaacson

Adam Millard-Ball

Ronnie Lipschutz

Tamara Ball

Linda Werner **

Tela Favaloro: Lecturer, Electrical Engineering, Baskin School of Engineering,

Richard Jullig **email for bio

Trash Toss

Grace Ko

SCRUM process: tracking method design software (product owner) mediator btwn dev team & sponsor

Focus on gamifying waste education: 2 modes, focusing on curbside sorting and the recycling center

Recycling center: straight to landfill unless to recycling or compost .money bar represents overhead costs of recycling center operation, and fades to zero unless supplemented by correct sorting.

Element of time control; bins 'gray out' when certain items are tossed to reflect the longer decomposition/processing time of those items.

Trash Toss design & waste watchers synergy proposal: dev team looking to implement personalized barcode tracking of user habits

3 different divisions (IDEASS, art, game design)

Pico solar lantern scorecard: universal system/survey/data analysis tool to be used for auditing solar lanterns within industry

Solar lanterns invented to meet lighting needs of 1.3 billion off-grid users currently dependent on kerosene lamps. Place accountability upon manufacturers. Two categories: material risks (geopolitical risk, destructibility, toxicity/emission, resource intensity, end of life), and mitigating factors (modularity, end of life, performance, sale service, liability). Granta design database for materials accounting after difficulties with destructive testing. Local vendors interested in the idea of a 'nutrition label' for a product.