

Sustainability Studio

Course Syllabus

Table of Contents:

1	Course Summary for instructors
1	Instructor Notes
4	Course Description for Students
4	Course Objectives, Core Competencies, and Learning Outcomes
7	Evaluation and Grading
8	Books and Materials
8	Schedule and Deliverables

Course Summary:

This course is designed to teach both graduate and undergraduate design and business students, either separately or together, the principles of sustainable product and service development. It has been taught successfully at the graduate level in the following programs:

- **MBA in Design Strategy**, California College of the Arts, San Francisco, CA, www.designmba.org
- **MBA in Sustainable Management**, Presidio School of Management, San Francisco, CA, www.presidiomba.org

In addition, elements of this course have been taught at both the graduate and undergraduate level (and informed by experiences teaching) at:

- **Haas School of Business**, UC Berkeley, Berkeley, CA, haas.berkeley.edu
- **Industrial Design program**, California College of the Arts, San Francisco, CA, www.cca.edu

This syllabus is designed to be a complete teaching module for instructors and includes the following pieces:

Syllabus and teaching materials: www.nathan.com/thoughts/DITP

- Syllabus (in PDF and Word)
- Presentation 1 (in PDF and PowerPoint)
- Presentation 2 (in PDF and PowerPoint)
- Project 1 Presentation Evaluation Criteria (in PDF and Word)
- Stakeholder Presentation Evaluation Criteria (in PDF and Word)
- Final Project Presentation Evaluation Criteria (in PDF and Word)
- Project Team Survey (in PDF and Word)

Instructor Notes:

To use this course, simply delete the preface pages (with text in green), make any modifications you would like to the course syllabus, add weekly due dates for the semester taught, fill-in the contact information for the instructors, and print or save to distribute to students.

This course has been structured for a 15-week semester studio course. You will likely need to modify to meet the needs of your schedule, including dates and holidays. It has been successfully taught in 5-day residency programs as well as 15-week programs. If the projects you give your

students don't require 11-weeks of development (for example, a packaging or graphic design projects, as opposed to a product or architecture project, feel free to shorten assignments and modify as necessary.

This course has been developed to be transdisciplinary and recognize no boundaries between various design disciplines. As such, it can be used in a variety of design programs, such as: graphic/visual/communications, industrial/product, fashion, interior, automotive/transportation, and packaging design as well as architecture. It has been developed at the graduate level for masters programs but can just as easily be used in an undergraduate program. It also values equally the creation of products as well as services and environments. Feel free to tailor the project requirements to suit the needs of your course and program. However, if your program doesn't support many opportunities for your students to consider different types of solutions across this spectrum, may we suggest that this course on sustainability would give them a natural and appropriate opportunity to do so.

It is our experience that physical products (and, in cases, environments) make for a better evaluation than services, events, or media campaigns. This is because students need to have access to a tangible object, in the beginning of this journey and services, events, and media campaigns are too ethereal and non-tangible to give them pieces to focus on. In addition, most of the system and impacts are hidden in services and events and students will have little access to these in their evaluation.

It is a good idea to set-up a course-wide online discussion mailing list via email or through a service such as Google Groups. This will allow students to discuss the material as well as post news relevant to sustainability they find during the course semester.

This course is designed around accreditation criteria like those required by WASC (the Western Association of Schools and Colleges). If your school uses learning objectives to track student progress and measure student learning, this section will be useful to (and provide "evidence" for) your program administrators and those in your school in charge of accreditation.

In practice, this course requires a lot of student time and work—more than 3-credits usually involves. It would be valid to attribute 4-6 units for this course depending on how it's taught and how schools attribute credits.

The last required book in the book list, *Leading Change Toward Sustainability*, along with the discussions in the last part of this course, is focused on sustainability in organizations. While it may not seem pertinent, at first, for students to learn about sustainability in organizations, for the near term, all designers will need to be champions of design with their clients or companies. Knowing about how organizations work and how to promote change serves not only the aims of sustainability but also arms students with strategies and tactics that serve the aims of design, in general. Past students of this course have shared that they had wished to read this book earlier as it has helped them understand how to lead any kind of change.

If you're uncomfortable with this book, we suggest any of the following:

Strategy for Sustainability, Adam Werbach, ISBN: 978-1422177709

The Business Guide to Sustainability, Earthscan Publications, ISBN: 978-1844077663

Cradle to Cradle, North Point Press, ISBN: 978-0865475878

A note about guest speakers: it's not always possible to get nationally-known leaders to speak to students, either because of time or location constraints. Sometimes, it's possible to engage guest speakers online, using teleconferencing, chat, or other distance learning technologies. Skype, for

example, can be useful for knowledgeable and experienced professionals to engage in a two-way conversation with students.

For critiques, guests need to be physically present for presentations and feedback. Online technologies are too problematic and have too narrow a scope for adequate feedback.

To find and contact candidates to speak in courses, try engaging local organizations that serve the sustainability and social entrepreneurship communities. There is usually more happening in any community than most people realize. Some organizations to look for are:

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Design is the Problem Studio Course Syllabus

Instructor: <your name here>

Email: <your email address here>

Phone: <your phone number here>

Course Description:

Sustainability is a lasting trend that is changing the profession and industry of all design disciplines forever. This course is designed to introduce students to the principles, frameworks, and tools of sustainability in several modes, including: readings and discussions, a 4-week team evaluation project, and an 11-week team design project.

Design has a long history of sustainability and social justice. There have been many designers creating solutions throughout history that increase efficiency and performance of objects and systems, create value and health for people, and delight customers at the same time. Unfortunately, the design profession has also releases egregious things that waste resources, harm people (mostly unintentionally, but not always), make people feel awful about themselves, and cater to the worst of our natures. Sustainable design is a movement and set of principles to reset this approach and use design to the best extent of its abilities. These themes will emerge several times throughout the course.

Sustainability encompasses not only environmental issues but social and financial issues as well. At its heart, sustainability is about systems thinking. Conveniently, design—at its best—is about systems solutions so the two subjects support each other well. Throughout the semester, students use practical tools and techniques for identifying issues, developing solutions, troubleshooting problems, measuring progress, and implementing organizational change.

This course consists of two main projects. The first is a 4-week group assignment to evaluate a product in terms of sustainability using one or more common sustainability frameworks. The second is a group development project of either a product or service with an emphasis on solving customer and societal needs sustainably.

Course Objectives, Core Competencies, and Learning Outcomes:

Along with the two course projects, students in the this studio will explore, though readings, discussion, guest lectures, and assignments, the processes and strategies for creating sustainable change within organizations.

Guest lectures will allow students the opportunity to interact with sustainability professionals from a variety of backgrounds and with a variety of perspectives.

Learning will take place through faculty lectures; regular reading assignments; interactive discussions in the classroom and online; student presentations; project critiques; group projects; hands-on activities; and review and reinforcement of critical knowledge and skills.

Objectives

- To build understanding, awareness, and comfort using sustainability criteria and frameworks, the vocabulary of the sustainability industry, and the processes and principles required to make sustainable change in business.
- To build experience in developing sustainable product and service solutions.
- To hone presentation skills, design skills, and critical thinking skills.

Learning Outcomes

Primary Learning Objectives:

Critical Analysis Skills

Students will learn to analyze products from a variety of sustainability frameworks and assess claims made by manufacturers about the sustainable attributes of their products. Students are required to perform deep analysis of impacts on natural, human, and financial capital with regards to business solutions. Student's solutions will, necessarily, require balancing many factors, including feasibility, usability, usefulness, meaningfulness, and financial viability, in addition to sustainability.

Interdisciplinary Methods

Students will use a variety of processes from several disciplines (including product design, communications, management fundamentals, materials engineering, and financial and social assessment frameworks) to develop real world solutions. Readings build on varied student experience to describe and use multi-disciplinary perspectives in development process. These are evaluated with feedback and graded throughout class. Students develop a plan that reflects the many disciplines required to develop a solution, including marketing, engineering, customer service, leadership, clients, and customer contact.

Professional Development Methods

Students will develop professional communication and group management skills within the context of two team projects. All students will take part in preparing reports and other deliverables to a professional level, participate in all presentations (even for group projects), and cultivate a high level of presentation confidence. Students will receive feedback on their presentation skills as well as the content of their presentations.

Research Skills

Class projects will require students to research various factors and search for deep data in order to complete assessments of sustainability impacts across natural, human, and financial capital areas. These skills will apply to customers and markets as well as materials, manufacturing, and product life-cycle data.

Collaboration Skills

Most of the projects in this class will be team-based, requiring extensive interaction in accommodating various personality differences and managing the range of creative confidences. Additionally, students may be exposed to individuals from various companies and organizations, in which they will have to interact diplomatically and effectively. Team assessments will be used to quantify and qualify team issues throughout the class. Emphasis will be placed on team interaction and individual contribution over the final project solutions themselves. Two team projects requiring shared deliverables and high-performance interaction. Students demonstrate the use of collaborative language and actions in meeting deadlines and contribute to all aspects of each deliverable. Students rate each others' performance after each project.

Discipline-Specific Techniques Skills

Readings, projects, reports, and feedback focuses on sustainable design and development, frameworks and processes, as well as corporate and organizational aspects of leading sustainable change within companies. Students demonstrate understanding for process steps, assessment measures, and documentation by documenting complete and detailed actions in their reports.

Understanding: Sustainability

The readings will focus on all aspects of state-of-the-art understanding of sustainability, including assessment techniques, frameworks, and principles. Students will constantly be required to assimilate the vocabulary of sustainability, as well as frameworks, and demonstrate both in their discussions and deliverables. They will interact with several sustainability professionals, providing them with the opportunity to discuss issues and test their knowledge and proficiency.

Meaning and Value Creation Understanding

Project solutions will be judged not only on sustainable impacts to human, natural, and financial capital but also on their value, innovation, and meaning to their intended customers and audiences. Projects will be critiqued and judged on meaning criteria and tools as well as sustainability measures.

Creativity and Critical Thinking Skills

All of the projects in this class will require innovative and dynamic problem solving initiatives. Project outcomes must demonstrate confident approaches with relevant and thought provoking solutions. Regular evaluation and critique (by professor and external guests) of original, creative solutions to project challenges. Written and oral feedback. Students are critiqued on the originality and creativity of their proposed solutions, their progress throughout the course in developing and iterating prototypes, and their ability to reflect on critique deeply.

Secondary Learning Objectives:

Oral Communication Skills

Through three graded & critiqued presentations, students' abilities are evaluated in how they clearly and concisely prioritize their thoughts, and present in accordance with professional standards.

Written Communication Skills

Four written project reports, weekly discussion postings, and final deliverables will require students to clearly and concisely prioritize their development and describe coherently their learnings. Students are able to adequately separate summaries from details and use appendixes for supporting material. Students are able to clearly and concisely

communicate their ideas in weekly postings about the readings, contribute original analysis, and respond to each other's postings interactively in order to build a conversation (not merely a set of singular points).

Visual Communication Skills

A design journal is required throughout the course and is due at the end. In addition, prototypes and visual presentations are critiqued throughout the class, based on clear, concise visual communication. Students show competency and improvement in using visual tools and techniques in their sketches, presentations, and prototypes.

Leadership Skills

Students will be required to take turns leading their teams as well as demonstrate that they understand the fundamentals of leading (sustainable) change within organizations. Project deliverables, such as project summaries and sustainable return on investment calculations allow students to demonstrate how they form and support arguments outlining sustainable benefits of their solutions.

Evaluation and Grading:

This studio course is a 3-credit course. Students can expect to spend approximately 5-6 hours a week on average in completing assignments in reading, group projects, and online discussion and interaction.

The grading range for the course is A-F, with weighting as follows:

Individual Classroom (or online) Participation & Attendance	15 pts.	20%
Short-Term Group Projects (product evaluations, studies, in class work)	10 pts.	20%
Long-Term Group Project (selected by team)	40 pts.	40%
Design Journal	10 pts.	10%
Lessons Learned Paper and Discussion	10 pts.	10%
	100 pts.	100%

Academic Integrity: We encourage full group and class collaboration on all aspects of this course. It is almost impossible to share too much information in product development. We do expect that all team members will contribute substantially to the project efforts, although some students will choose to devote themselves to the projects beyond what is required for the course. Students will be asked to critique and contribute to the development projects of others in the class in a cooperative, supportive environment, and will be asked to submit critiques of their own group and group members during the course of the semester. However, individual assignments, such as posts, are to be done individually, in the own words of the student.

Non-original work will be disqualified. Late assignments will be deducted 5% for each day late.

Grades will be assigned for cumulative points according to the following formula:

90 – 100%	A
80 – 90%	B
70 – 80%	C
60 – 70%	D
< 60%	F

Books and Materials:

This course is designed to use three books as their primary texts. These address different approaches and domains.

Natural Capitalism, Paul Hawken, Amory Lovins and Hunter Lovins, Back Bay Books, 2008, ISBN: 978-0316353007 <http://www.amazon.com/Natural-Capitalism-Creating-Industrial-Revolution/dp/0316353000>

<Note: your students can find PDFs of the chapter sin this book, for free, here: <http://www.natcap.org/sitepages/pid20.php> >

Design is the Problem, Nathan Shedroff, Rosenfeld Media, 2009, ISBN: 978-1-933820-00-2 www.rosenfeldmedia.com/books/sustainable-design

Leading Change Toward Sustainability, Bob Doppelt, Greenleaf Publications, 2003, ISBN: 978-1874719649 <http://www.amazon.com/Leading-Change-Toward-Sustainability-Change-Management/dp/1874719640>

Schedule and Deliverables

Week	Dates	Topics & Activities
1		<p>Module One: Sustainability Frameworks and Systems</p> <p>Presentation and Discussion: Sustainability and Sustainable Frameworks</p> <p>Explain: Product evaluation assignment</p> <p>Group Assignment: Select a product for evaluation and post it in this forum, listing the team members working on the evaluation. Identify the product chosen for evaluation and state the rationale behind the choice. Indicate your initial perception of the impact of the chosen product on a sustainable world. Begin the product evaluation, using the information from the lectures and readings. Choose a primary evaluation framework or tool (such as The NaturalStep,™ Natural Capitalism, or the five principles outlined in Datschefski's book <i>The Total Beauty of Sustainable Products</i>) for assessing the sustainability of your assigned product. Be prepared to defend your choice of framework. In addition, evaluate the product through a Life Cycle Assessment tool, such as the one available from Sustainable Minds: http://www.sustainableminds.com</p> <p>By the end of Week 4, you will finalize a group report and a presentation of your efforts. The group report will be a concise summary (4-8 pages), describing the relative sustainability of the product and how you would change, replace, or scrap it to achieve a truly sustainable one. A concise, 15-minute presentation will complement the written summary. The written summary and presentation will be finalized during Week 4 for presentation during Week 5.</p> <p>Email or Post: Product Evaluation Choice</p> <p>Read: <i>Design is the Problem</i>, Introduction through Chapter 3</p> <p>Discuss: Week's reading</p> <p>Exercise: Map any system</p> <p>Optional: guest speaker</p> <p>Optional: Field Trip: local dump, recycling center, or waste processing plant</p>
2		<p>Read: Natural Capitalism, Ch. 1 and 2</p> <p>Read: Introduction from Total Beauty, by Edwin Datschefski:</p>

	<p>www.biothinking.com/btintro.htm</p> <p>Email or Post: Use and compare 3 Carbon Footprint calculators Use the following three carbon footprint calculators and post your scores to the Readings Forum. Are the results similar? Comparable? Accurate? UC Berkeley Cool Climate Calculator: coolclimate.berkeley.edu/ Climate Crisis Climate Calculator: www.climatecrisis.net/takeaction/carboncalculator/ LiveNeutral Carbon Calculator: http://www.liveneutral.org/calculator/</p> <p>Discuss: Week's reading In class:</p>
3	<p>Read: Natural Capitalism, Ch. 10 and 11 Read: Sustainable Products and Dematerialization Excerpt, by Fuller In class: Post: Evaluate a protection solution for a given endangered species in a systems context</p>
4	<p>Read: Natural Capitalism, Ch. 3, 4, and 5 Discuss: Week's reading Email or Post: Product Evaluation Presentation Post ideas for semester projects you'd like to work on. We will have a marketplace at the second residency for people to vote, combine, bribe, and create groups of 4-6 around these ideas. You can choose to develop a product or service that is a more sustainable solution to what's currently available, create a solution to some deep sustainability or systems challenge, or create a market mechanism that changes a system in a more sustainable way.</p>
5	<p>Module 2: Resource Use Present: Product Evaluation & Lessons Learned (15 minutes each) Presentation and Discussion: Design Strategies In Class: Group into teams around ideas for semester project Read: <i>Co-creating Business's New Social Compact:</i> www.theatlantic.com/doc/199810/environment/2 Read: <i>Design is the Problem</i>, Ch. 4 and 5 Read: www.lunar.com/docs/the_designers_field_guide_to_sustainability_v1.pdf Begin: Stakeholder needs interviews in the context of sustainability For your group project, begin identifying and interviewing stakeholders in order to better understand the needs within the domain you've chosen. You will present these needs in Week 8. <Note to instructor: for an in-depth description of customer research, refer to the Experience Design syllabus at...> Discuss: Week's reading Resources: www.future500.org/case_03.php mts.sustainableproducts.com/standards.htm www.greenflyonline.org www.idsa.org/whatsnew/sections/ecosection/okala.html</p>
6	<p>Read: <i>Design is the Problem</i>, Ch. 6 through 9 Read: Natural Capitalism, Ch. 6 and 7 Discuss: Week's reading In class:</p>
7	<p>Read: <i>Design is the Problem</i>, Ch. 10 through 14 Read: Natural Capitalism, Ch. 8 and 9 Discuss: Week's reading In class:</p>
8	<p>Read: <i>Design is the Problem</i>, Ch. 15, 17, 18 Read: Leading Change Through Sustainability, Ch 6 & 7 Present and Critique: Customer Research (15 minutes each) & Lessons Learned</p>

	<p>Discuss: Week's reading Post: <i>Group Assignment Due: Stakeholder Needs Presentation</i></p>
9	<p>Module 3: Making the Case for Sustainability Internally In Class: Concept Generation Brainstorming & Selection Making the Case Internally: Real-World Experience Discuss: Week's reading In class: Read: Natural Capitalism, Ch. 12 and 13</p>
10	<p>Read: Natural Capitalism, Ch. 14 and 15 Read: Leading Change Through Sustainability, Ch 8 & 9 Discuss: Week's reading Present and Critique: Project Status, Prototype Solutions</p>
11	<p>Read: Natural Capitalism, Ch. 14 and 15 Read: Leading Change Through Sustainability, Ch 8 & 9 Discuss: Week's reading In class: Post: Competitive Product/Service Assessment</p>
12	<p>Making the Case for Sustainability Externally Making the Case Externally: Real-World Experience Making the Case Externally: Profit/Non-Profit Partnership Optional: guest speaker Present and Critique: Project Status, Prototype Solutions In Class: Team Design time and Prototype Iteration, workshop on Blended Value</p>
13	<p>Read: Leading Change Through Sustainability, Ch 12 & 13 Read: Leading Change Through Sustainability, Ch 10 & 11 Read: <i>Social Return on Investment – Exploring Aspects of Value Creation in the Non-Profit Sector</i>: hbswk.hbs.edu/archive/1957.html Read: SROI Case Studies: gsvc.org/index.cfm?fuseaction=Page.viewPage&pageId=211&parentID=58&nodeID=1 Read: Frameworks and Approaches for SROI Analysis: www.svtconsulting.com/pdfs/SROI_Analysis_1%5B1%5D.0.pdf Discuss: Week's reading In class: Post: Blended Value Evaluation <i>Criteria</i> Optional: Post: Profitability Analysis <i>Draft</i> Attempt an informal profitability analysis using the process described in Chapter 15 of Ulrich and Eppinger, pages 312-320. You won't have all of the information needed to do a rigorous analysis but you should be able to make general assumptions about costs and revenue based on other solutions in the market. Don't take this too seriously but try to be as persuasive, accurate, and grounded about assessing your solution as possible.</p>
14	<p>Scan: Leading Change Through Sustainability, C3 Appendices Post: Final Product Presentation (including finished SROI calculations and Profitability Analysis) Discuss: Week's reading In class:</p>
15	<p>Sustainability in a Greater Context Present: Final Solution (15 minutes with 10 additional minutes of Q&A) Tradeshow In Class: Discussion of Lessons Learned Post: Final Product Description Post: Lessons Learned Paper</p>

Turn-in (or post): Design Journal
Optional: guest speakers and critiquers
