

Future Craft Syllabus

Future Craft: Radical Sustainability in Product and Ventures

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Instructors: Amanda Parkes + Leonardo Bonanni

From sweatshop fires to superstorms, society is coming to terms with the reality that business-as-usual is unsustainable: socially, economically, and environmentally. A new generation of goods and services is emerging to address humanity's needs as they continue to grow. Future Craft is designed to look at new ways of making things, from the way materials are sourced and manufactured to the way customers are considered. We are interested in re-configuring industry, its systems and services. This class will look at way to reshape business, technology and design to create new, radically sustainable products and companies.

The class is divided into two sessions: a 7-week skills session during which students will learn the latest methodologies for evaluating environmental, social and financial impact (the triple bottom line) and a 7-week proposal and prototyping session, during which students will prepare fleshed out proposals for product or companies.

Prerequisites:

This course is open to students from all disciplines interested in making meaningful change by designing a new kind of product, service, or company. Backgrounds in business, engineering, architecture, product design, and technology are welcome.

Session A

1. An Introduction to Radical Sustainability: Understanding the Network of Things and People

Consider the physical social network represented by modern manufacturing supply chains. There is hardly a product we use that hasn't passed through the hands of thousands of people before it reached us, and will do so again once we're finished with it. How do we appreciate the value of things? How can we measure it? What can we add to the things we touch so that they provide increasing benefit once we're finished with them? As an introduction, we'll consider the triple - no, quadruple bottom line when evaluating a ubiquitous device: a computer. The financial impact can be gauged based on where it's made, under which regulations, and by what processes. The environmental impact can be estimated through Life-Cycle Assessment. The social impact can be monitored through social media, audits, and supplier engagement. The cultural impact: we still need a way to measure it.

Topics covered: supply chain thinking

Assignment: Product autopsy

2. Sustainability, Resilience, and Business Continuity

Sustainability has evolved from pure environmentalism into a frenetic concern for meeting the needs of the global population. In the new scramble for sustainable systems of production, the needs of activists, governments and multinationals often align. We'll consider the history of environmentalism, leading to the adoption of life-cycle assessment and triple-bottom-line accounting for operationalizing sustainability.

Topics covered: the history of environmentalism, life-cycle assessment, social hotspot accounting

Assignment: De-technologize your product

3. Traceability

Without knowing where things come from (or where they go), it's impossible to account for their impact. Companies have adopted traceability for years to ensure quality control and prevent counterfeiting. Now NGO's and researchers are finding ways to track and trace timber and conflict minerals. But most means are expensive, time-consuming, and rely on new communication channels across countries and industries. We'll consider the latest high- and low-tech traceability technologies and look for opportunities to innovate and bring transparent, traceable goods to market.

Assignment: Up-Cycle

4. Advocacy and Accountability

Development initiatives represent the third pillar of sustainability. How do we ensure that industry improves the livelihoods of all those participating? The process of Monitoring & Evaluation (M&E) has evolved to help determine the ROI of development. Using long-term randomized trials of various development initiatives against control communities, it becomes possible to determine Key Performance Indicators of social sustainability and make a business case alongside environmental and financial concerns.

Topics Covered: Monitoring and Evaluation

5. Cultural Sustainability

The fourth pillar of sustainability can be defined as cultural: how can we make products that perpetuate diversity on a global and local scale. We will consider how mass-manufacturing can be subverted to create local cultural representation, and what community-centered design can do for designers and local production.

Session B:

6. Sustainable Cultures and Production Communities

Contemporary sustainability can be more richly and clearly defined as a system of social behavior patterns, recognizing an interdependence of ecological sustainability and cultural vitality. Examining and tapping into patterns of lifestyle, history, and ethos helps create innovation which blends naturally into existing communities structures with appropriate parameters for long term integration and meaningful change.

7. Closed Loops Systems and Aggregated Processes

Much innovation comes not from the development of a single new technology, but from the combination or synthesis of previously unrelated technologies or practices. Such integration and aggregation can lead to entirely new models of production leveraging existing skill sets and community values with local resources (material or human) and existing systems.

8. Biomaterials & Processes

Current fabrication methods for the development of materials are energy intensive in production and unsustainable in nature, often utilizing non-renewable fossil fuel resources for production and transportation necessities. New methods in growth and aggregation which use living organisms in the production of materials present possibilities for materials which can be immediately intertwined with natural cycles of waste and renewal. A biomaterial can be defined as a substance that has been engineered to take a form, alone or as part of a complex system, through control of interactions with components of living systems, encompassing elements of biology, chemistry, materials science, and tissue engineering.

9. The Quantified Self

Ideas around the quantified self and wearable technologies are emerging as the next big thing within the field of consumer electronics, however human-centered design has long been a tenet of contemporary design, and studies in ergonomics have taught designers to revere the form and abilities of the body as the standard for analysis in interaction. With these new technologies, our notion of the body is changing - becoming enhanced, augmented, expanded in functionality and altered in form, while ubiquitous & embedded technologies are allowing the devices we carry and the garments we wear to converge into a 'secondary skin' which functions as an extension of ourselves creating our own mobile personal environment. Beyond our exteriors, advancements in biotechnology are allowing for an easier facilitation of changing the body from the inside out through DNA modification or synthetic biology, creating a rich and inspiring landscape for future thought experiments around the body.

Instructor Bios:

Leonardo Bonanni, PhD

Dr. Leonardo Bonanni is the founder and CEO of Sourcemap: the supply chain transparency company. Companies and consumers use the Sourcemap.com to see where products come from, including the social, environmental, and financial risks. Powering Sourcemap is a social network for supply chains, so that organizations can connect with thousands of vendors to ensure long-term continuity. One day soon you'll be able to scan a product on a store shelf and be instantly connected to the people who made it.

Leo is one of Businessweek's "America's Most Promising Social Entrepreneurs 2012" and Ethisphere's "100 Most Influential People in Business Ethics" (2011). He teaches sustainable entrepreneurship at MIT, has a PhD from the MIT Media Lab, Masters' from MIT and a Bachelor's from Columbia; and has a background as an inventor, a designer, and a performer. Learn more about Leo at leonardobonanni.com and Sourcemap at sourcemap.com.

Amanda Parkes, PhD

Amanda Parkes is a biomedica designer & fashion technologist interested in how digital technologies and smart materials can expand our relationship with natural phenomena to facilitate a more intuitive connection interfacing technology to the natural world. Her dissertation work in the Tangible Media Group at the MIT Media Lab focused on computational materiality in kinetic interfaces as an area of innovation in future products— combining principles of abstracted motion in robotics with hybrid materials to empower designers in the process of kinetic improvisation and motion prototyping. She is the founder of Skinteractive Studio, developing fashion technology and hi-tech textile projects for use in areas ranging from performance to medicine and is currently working on sensor embedded costumes for the performance of Streb Extreme Action at the London 2012 Cultural Olympiad. She is also the founder and CTO of Bodega Algae, a company developing a modular, scalable, microalgae photobioreactor for the production of high-energy algal biomass for use in the production of biofuel and a recipient of an NSF Small Business Innovation Research award. She currently teaches in the Columbia University Department of Architecture on courses topics ranging from decentralized and parasitic energy systems to body augmentation and was formerly a scientist-in-residence at NYU ITP developing research and curricula around interaction design with biological organisms. She is the co-curator of Regeneration, a major new exhibition opening in October 2012 at the New York Hall of Science featuring contemporary interactive art on themes of art, science, and cultural sustainability. Her prior work includes developing exhibits and educational media at the Exploratorium in San Francisco, the Science Museum in London, and the the Peggy Guggenheim Collection in Venice. Amanda holds a PhD & M.S. from the MIT Media Lab and a B.S. in Product Design and a B.A. in Art History from Stanford University. Her work has been featured in various internationally recognized design and art awards including the ID Magazine Annual Design Review, the Art Director's Club, and the Prix Ars Electronica and she was named one of Mass High Tech's 'Women to Watch' in technology in 2008. and the garments we wear to converge into a 'secondary skin' which functions as an extension of ourselves creating our own mobile personal environment. Beyond our exteriors, advancements in biotechnology are allowing for an easier facilitation of changing the body from the inside out through DNA modification or synthetic biology, creating a rich and inspiring landscape for future thought experiments around the body.