



Santa Clara University

Frugal Innovation Lab

Photo: As part of the Border Green Energy Team (BGET) in Cambodia, a group of Cambodian students study a water filtration plan developed by Santa Clara University students. Courtesy of BGET.

In 2009, Santa Clara University launched a new core curriculum that engages students in sustainability, sustainable building design, and using the campus as a living lab. As a follow-on in 2011, the university created the Frugal Innovation Lab, which fosters development and application of technologies in clean energy, clean water, public health, and mobile applications, in ways that meet the needs of marginalized communities worldwide.

Frugal Innovation addresses the fact that traditionally these products and services are often prohibitively expensive, difficult to use and maintain, and not well-suited overall to the regions for which they are intended. Ruggedization, simplification, sparing use of low-cost raw materials, an emphasis on earth-friendly practices, and a philosophy that favors “good enough” over “perfection” in creating compassionate, utilitarian design are the program’s primary goals. The School of Engineering and Center for Science, Technology, and Society (CSTS) jointly run the program.

Frugal Innovation Labs distinguishes itself from many other innovation programs by closely integrating the classroom curriculum with hands-on student work with SCU’s network of alumni from its “Global Social Benefit Incubator” and its “Tech Award” laureates. Students learn the necessity of frugal innovation by analyzing specific design constraints of an entrepreneur’s engineering challenge. Partnerships between social entrepreneurs and Frugal students often continue beyond the classroom to become student research and senior design projects.

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By developing technologies that promote sustainable development and promise a better life for some of the world's most impoverished populations, and simultaneously addressing the economic feasibility of adopting and using these technologies, Frugal Innovation works to address all dimensions of sustainability (environmental, social, and economic).

Benefits

As director Radha Basu points out, the Frugal Innovation Lab is spearheading Santa Clara University's participation in the global field of mobile health – by aggregating best-of-breed applications, building new engineering solutions and hosting interoperability platforms. FIL also fosters unprecedented collaboration among engineers, social entrepreneurs, students and faculty to incubate and scale development projects for social impact.

Frugal Innovation engages all dimensions of Santa Clara University's academic mission by embedding special courses within engineering, business, public health, and environmental science. Each course trains students for best practices in a developing world context. Grant programs fund faculty and student research. The Lab space itself is a collaborative space for students and faculty to engage industry partners and NGOs to research and implement innovative technologies for underserved communities. The lab environment, along with expert faculty guidance, facilitates the challenging transition from theoretical learning to practical skill application.



“In all our initiatives, Santa Clara University looks at sustainability not just through an environmental lens but also in a framework of social justice, examining how sustainability can be just and economically viable.”

- SCU President Michael Engh, S.J.

Photo: SCU design thinking workshop. Courtesy of Katrina Jazayeri.

Looking Forward

With its location in the Silicon Valley, Santa Clara University's interest in educating for a just world makes it a natural place for growing more initiatives such as Frugal Innovation that embody the idea of “business for a better world.” The institution continues to seek ways to educate its students on and off campus to help them develop a deeper understanding of sustainability.

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Photo: The Border Green Energy Team (BGET) in Cambodia. Courtesy of BGET.

Notable Accomplishments

- Courses developed for the program include “Engineering for the Developing World,” “Mobile Applications and Instrumentation,” “Clean Energy for the Developing World,” “Android for Social Benefit,” and the newest course, “Frugal Habitat,” still under development. Courses highlight the Frugal Innovation Lab core competencies and use case studies to examine what works and what doesn’t with respect to innovative approaches to development.
- The Frugal Lab opened in the School of Engineering and became home to a Mobile Health Lab that hosts several leading online interoperability solutions including OpenXdata, DHIS2, and Open MRS for data collection, health checking, regime adherence, and monitoring.
- Over 30 student projects are in progress or completed including:
 - *Pathogen detection using a micro-fluidic device*
 - *Renewable energy and sustainable technologies including efficient solar cook stoves, bio-digesters, and water purification (as part of the Border Green Energy Team (BGET) in Cambodia)*
 - *“Milagro Water Wheel,” a novel water transport product that is simple and rugged and facilitates access to clean water while offering a 40:1 reduction in the effort to carry it*

