



# Certificate in Engineering and Community Engagement

*Offered at Penn State University Park*

## For more information, contact:

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The Engineering and Community Engagement (ECE) Certificate Program recognizes students who have gained proficiency in design, research, and technologies for use in serving communities in the United States and abroad while stressing an awareness of the cultural and entrepreneurial context of such engineering activities. Collaborations with communities are strongly encouraged along with emphasis on the importance of ethical considerations when working in such settings.

The completion of 12 credits is required for the certificate program. The certificate is designed as a pathway to the intercollege Minor in Civic and Community Engagement for engineering students.

## ABOUT THE CERTIFICATE

The Engineering and Community Engagement Certificate Program involves design under constraints to directly improve the well-being of underserved populations, which may be defined as Humanitarian Engineering. Humanitarian Engineering places strong emphasis on the cultural context of engaging in engineering activities that impact the poor, the marginalized, the disenfranchised, and those who lack the means to address pressing problems. As such, training for one who participates in Humanitarian Engineering incorporates history, politics, economics, sociology, language, entrepreneurship, and rigorous engineering basics.

## CERTIFICATE REQUIREMENTS

- Community engagement course
- U.S./international cultures course
- Foundations of Community Service Engineering
- Collaborative design project
- Project-related travel
- Professional engineering design portfolio

## APPLICATION

Students wishing to complete the Certificate in Engineering and Community Engagement must prepare an application indicating how they plan to meet the Certificate's requirements. The application must be submitted to the program coordinator. To continue in the program, students must earn a B grade or better in each qualifying course. The application can be found on the Web site: [www.engr.psu.edu/ece](http://www.engr.psu.edu/ece).

## ASSOCIATED PROGRAMS

*Engineers in Community Service (ECOS)*

- Student organization
- [www.engr.psu.edu/ece/ECOS](http://www.engr.psu.edu/ece/ECOS)

*International Journal for Service Learning in Engineering (IJSLE)*

- Peer-reviewed electronic journal
- [www.ijlsle.org](http://www.ijlsle.org)

## PROGRAM RATIONALE

Students in engineering face a future in which they will need more than just a solid technical background to be successful. In setting the goals for any system they are asked to design, they will be expected to interact effectively with people of widely varying social, cultural, and educational backgrounds. They will then be expected to work with people from many different disciplines to achieve these goals. It is increasingly more important for engineering students to become well-rounded and informed citizens.

Penn State offers the opportunity to enhance students' skills in such areas through the Engineering and Community Engagement Certificate Program, better preparing them for both their careers and their lives.

## GET INVOLVED

### *Kenya Eco-Village*

Penn State students and faculty will partner with counterparts at Jomo Kenyatta University for Agriculture and Technology (JKUAT) to address a serious need in Kenya—that is, the care of more than 300,000 street children. This initiative will create a prototype village, which will evolve over time to a system of eco-villages in Kenya to facilitate the successful exit of former street-dwelling children/youth from rehabilitation centers.

To facilitate this effort, students from five Penn State colleges, three campuses, and 16 different departments are collaborating with counterparts at JKUAT to design a demonstration village. The effort is vertically integrated. Design teams consist of students ranging from first-year through senior-level students with graduate students serving to mentor the teams in many instances. The effort focuses on the development of the physical infrastructure for the village, educating and training children, developing entrepreneurial ventures, and sustaining agricultural production capacity. Once completed, the village will serve as a model for replication in each of the provinces of Kenya.



At Penn State, the efforts are housed in two new courses: EDSGN 452, Projects in Community Service Engineering, and EDSGN 497C, Design for Developing Communities. The various EDSGN 452 design groups are multi-disciplinary and focus on a variety of design tasks. These tasks include housing; water sourcing and treatment; wastewater treatment; energy systems; agricultural production; education and training; biodiesel and soap making; steam engine development for electrical power production; water well drilling rig; *Wishvast*, a social networking project; and *Mashavu*, a cell phone-based medical assistance program. EDSGN 497C serves to coordinate all of the various teams from a project management standpoint and ensure cultural appropriateness and sensitivity in the design solutions.