EPICS: Engineering Projects in Community Service

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Abstract - Multidisciplinary, multi-semester design projects with real customers and a compelling context create a rich environment for engineering, technology and computer science students to learn about design, teamwork and experience the need for the professional skills that can be difficult to teach in traditional classes. Engineering Projects in Community Service (EPICS) is a model for implementing these characteristics within a service-learning framework where community service providers serve as the “customers”. The application of design to community issues can broaden students’ understanding of their discipline and has the potential to increase participation of underrepresented populations. This interactive workshop will introduce participants to the EPICS model of service-learning design; explore the educational needs and resources of the participants’ institutions and the potential for implementing similar programs at their own institutions.

Index Terms – Community service, Engineering design projects, Service-learning.

WORKSHOP DESCRIPTION

Many issues have motivated reform in engineering, technology and computer science education over the last decade. Industry’s call for a more well-rounded graduate who is better equipped today’s fast moving, global economy motivated ABET to redefine accreditation criteria with EC 2000 that places professional skills, such as teamwork, communication and awareness of social issues, into core curricula. The continued under-representation of women and minorities has fueled innovative curricular models that integrate active learning with relevant applications and the development of K-12 outreach programs. In parallel with these reform efforts, many other disciplines have undergone reform through service-learning. Service-learning integrates community service with academic learning to enhance learning and provide services to underserved populations in a community. Service-learning has the potential to address many of the same issues facing engineering education.

Engineering Projects in Community Service (EPICS) brings the benefits of service-learning into engineering and computer science curricula through multidisciplinary undergraduate design teams that establish long-term partnerships with local community organizations and agencies. The EPICS teams design, develop, deploy and support technology-based solutions to the issues facing their community partners. The EPICS model has been implemented at 15 universities across the country with many successes.

This interactive workshop will introduce participants to the EPICS model of service-learning design; explore the educational needs and resources of the participants’ institutions and the potential for implementing similar programs at their own institutions.

WHO SHOULD ATTEND?

Faculty, graduate students and professionals working with engineering undergraduates who are interested in learning:

• how to integrate service-learning into their engineering curriculum,
• how to implement multi-semester design projects,
• how to facilitate multidisciplinary design teams,
• about potential benefits in recruiting and retaining underrepresented students in engineering.

Participants of this workshop will be able to:

• Define the key attributes of an EPICS program,
• Understand characteristics of successful EPICS and EPICS-like programs
• Identify how EPICS can be used to meet engineering program outcomes
• Share and discuss ideas about incorporating EPICS or an EPICS-like program into their own curriculum.

Participants will receive a comprehensive set of references, course materials and templates that can be used in an EPICS program or in a multidisciplinary design and service-learning program.

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