Symposium on Undergraduate Nano-Education:
"Addressing the Challenges of Nanoscale Science & Engineering Education"

Presentation:

PNPA - a Transformative Approach for Learning and Practicing Nanoengineering

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Presenter Biography:

Robert Cormia is a full-time faculty member at Foothill College, where he teaches bioinformatics, informatics, and nanotechnology. Bob's background includes a long career in technology and business development, specializing in materials analysis and new market development working at Surface Science Laboratories from 1981-1994. After entering the Internet in 1994 as an educator and Web developer, Bob worked as an analyst at G2R and in business development at SuperBusiness Net and eCongo. He developed the e-commerce curriculum at Foothill College, and joined Foothill full-time in fall 2001, where he developed courses in Internet technology, bioinformatics, and nanotechnology. He completed the UCSC extension Certificate in Bioinformatics in 2003, and helped to develop Foothill College's certificate in the recently approved bioinformatics and nanotechnology programs. Bob now pursues research in Semantic Web Technologies, global warming and climate change, and energy policy. His interests include synthetic biology, smart grid technology, and social networking. He is a team member of Sustainable Silicon Valley (SSV), and a member of the Utilities and Sustainability Taskforce (USTF) for San Mateo County.

Abstract:

Materials engineering in general and nanoengineering in particular comprise a constellation of courses which provide a foundation in materials and nanoscience - but not a practical approach to engineering. Several industry and academic studies have highlighted the lack of practical engineering skills in both baccalaureate and advanced degree graduates. Industry must either train or retrain new employees to provide context for 'work'. Northwestern University and NCLT (Nanotechnology Center for Learning Technologies) has developed a novel framework – the PNPA rubric, which provides a practical framework for both learning and practicing nanotechnology and nanomaterials engineering. This rubric integrates the 'engineering method' into practical scenario-based pedagogy, and is the focus of a four-course intensive nanoengineering program proposed to the National science Foundation (NSF) by Foothill College in 2008-2009. This presentation will review the methods and approach to using PNPA in a scenario-based program, using Linked Learning Outcomes (LLOs) to enhance student and technician performance in advanced materials engineering.