ANFEI Workshop Proposal
Co-sponsored by IFEES
Universidad de Yucatán
Mérida, México
March 9-13, 2009

Title: Curriculum Innovation and Quality Assurance: a Roadmap for Excellence: A 5-day workshop

Goal: to help faculty, deans and higher education leadership understand the importance of planning curriculum innovation to respond to stakeholder needs, developing industry-university partnerships and a quality assurance culture for effective decision making and improvement at all levels in higher education. The NAE 2006 award winning Learning Factory program, its characteristics and development process will be used as an example throughout the course.

Expected outcomes: At the end of the workshop, participants will be expected to:

- Understand the basics of curriculum innovation in response to stakeholders needs
- Become aware of how to transform a traditional course syllabus into a competency-based syllabus
- Learn about student learning outcomes, assessment tools and consider adopting them in their classrooms
- Develop a plan for curriculum innovation
- Understand the importance of establishing a quality assurance culture for continuous improvement of higher education
- Understand the basics of building and nurturing university-industry relationships

Delivery Mode: delivered by a team of academic and industry leaders this course will show the importance of bottoms-up innovations supported and enhanced by top-down leadership support in partnership with industry stakeholders. Workshop involves a combination of theory and practice with active learning (working in teams and interacting with workshop leaders). Workshop leaders have over 10 years and 80+ workshop delivery experience, in local and international venues.

Bios of workshop leaders:

Jorge Iván Vélez-Arocho, PhD, is Chancellor of the University of Puerto Rico at Mayaguez (UPRM). Since 1972 he is a professor of Decision Sciences in the School of Business Administration of UPRM. He holds a Ph.D. from the University of Florida, Gainesville, Florida in Management Science. From 1986 to 1990 he was the Dean of the School of Business Administration at UPRM. From 1992 to 2002 he was the Co-director of the Center for Hemispherical Cooperation in Research and Education in Engineering and Applied Science (CoHemis: http://ece.uprm.edu/cohemis/. Dr. Vélez-Arocho is a Member of the Education Advisory Committee of the USA General Comptroller; Vice President of the Puerto Rico

Intercollegiate Sports League; President of the Latin American and Caribbean Consortium of Engineering Institutions; State Representative to the American Association of State Colleges and Universities; President of the International Education Committee of the American Association of State Colleges and Universities and member of the Governing Board of the Hispanic Association of Colleges and Universities. As Chancellor of the UPRM he is the President of the Administrative Board and the Academic Senate of the University of Puerto Rico at Mayaguez (UPRM). He presides the Budget Committee of the University Board of the University of Puerto Rico (UPR) and is member of the Board of Permanent Constructions of the UPR.

His experience in outreach, dissemination, and multidisciplinary efforts include the following programs: Global Awareness Program—Co-PI. Project to present the international perspective to engineering, sciences, and business students and faculty—Funded by the Department of Education of the US; Manufacturing Engineering Education Partnership- In charge of outreach and coordinator of the course Technology Based Entrepreneurship—Funded by NSF; Grants from the Values & Ethics Program of NSF - Co-PI. To develop strategies to incorporate ethics and values in engineering, science, and business curriculums at UPRM http://ece.uprm.edu/cohemis/etica/; An integrated Management Plan for the Mayaguez Bay Watershed – The implementation of the Vital Issues Process to incorporate stakeholders in the development for a management plan for the Mayaguez Bay watershed. Funded by EPA (http://ece.uprm.edu/cimp/); Partnership for Spatial and Computational Research (PaSCoR) – funded by NASA. In charge of outreach (http://ece.uprm.edu/pascor/); Technology Based Entrepreneurship Course (TBE) –National Collegiate Inventors and Innovation Alliance funded. Product realization program for engineering, science, and business students and Learning Factory Workshops in Latin America—two day workshops on how to develop a hands on--outcomes based curriculum, Funded by Microsoft Research, http://ece.uprm.edu/lfw/. Vélez-Arocho is involved in community activities such as: producer of a radio program "Somos un Pueblo que Espera Algo Major"; member of two regional hospital advisory boards; and develops community programs related to youth development.

Rosa Buxeda, PhD is chairman of the Industrial Biotechnology Program, University of Puerto Rico at Mayaguez (UPRM). She is Professor of the Department of Biology with interest in industrial microbiology and educational research. She coordinates the Industrial Biotechnology Learning Center at UPRM. In this capacity, she was responsible to establish a million-dollar laboratory for training in biotechnology and supervises and develops customized training curricula for multinational biotechnology companies. For three years she served as the Vice-President of the Puerto Rico Alliance for Biotechnology, and currently serves in the Board of Directors of the Bioprocess Training and Research Complex. As part of her interest in K-12, she coordinated for three years the Biotechnology Summer Camp, an island-wide initiative to promote biotechnology. She chaired the following initiatives: Latin American and Caribbean Biotechnology Congress and the Biotechnology Week. Dr. Buxeda is the editor of the Industrial Biotechnology Newsletter. Her educational research interests include learning styles, assessment strategies and design of curricula in an outcomes-based approach. Her work was recognized with the Arturo Carrion Award by the Puerto Rico Society of Microbiology. She is the PI of the Biotechnology Mentorship Initiative to Develop Scientists (Bio-MINDS), a one-million dollar systemic initiative to promote bioscience undergraduate research among five UPR campuses. Her work has resulted in over 100 publications, as well as presentations and workshops. Buxeda is a multiple year honoree of Who's Who Among America 's Teachers and was board member of the International Society for Exploring Teaching Alternatives. She holds a Ph.D. form Rutgers University at New Brunswick, an M.S. from the University of Wisconsin Madison, and a B.S. in Industrial Microbiology from UPRM. Under her leadership, the Industrial Biotechnology Program was awarded the 2006 Innovator Award from the Southern Growth Initiative.

John S. Lamancusa, PhD, PE, is a Professor of Mechanical Engineering and the Director of the Learning Factory at Penn State University. Before coming to Penn State in 1984, he was employed at AT&T Bell Laboratories. At Penn State, he teaches courses in design, vibrations, noise control, product dissection, mechatronics, and supervises industry design projects. He received his Ph.D. in mechanical engineering, with a minor in electrical and computer engineering from the University of Wisconsin-Madison in 1982. Dr. Lamancusa earned his B.S. in mechanical engineering from the University of Dayton in 1978. He is a Research Fellow of the Humboldt Foundation, a member of ASME, ASEE, and a recipient of the 2006 Bernard M. Gordon Prize for Excellence in Engineering Education.

Lueny Morell, **MS, PE**, is Director of Engineering Education Innovation for Hewlett Packard Corporate Laboratories (HP Labs). A licensed professional engineer, she holds a MS degree in Chemical Engineering from Stanford University. Her responsibilities include extending the reach of HP Labs through programs that organize engagement with the external research community in alignment with HP technology strategies; broaden funding opportunities through public/private partnerships, and facilitate access to top talent in key growth areas; partner with industry, government and academia to improve collaboration, accelerate knowledge transfer, and foster capacity-building in support of economic development; and, work with leading research institutions and education organizations around the world to drive innovation, quality assurance and diversity in engineering-and-science education. Main program areas include engineering education curriculum innovation and development in areas of interest to HP Labs research strategies and student programs (internships and innovation competitions). From 2002 to 2007 she was Director of HP Labs University Relations for Latin America. Before joining HP in 2002, Lueny had a 24 year career at the University of Puerto Rico, holding various positions at the Mayagüez Campus (UPRM) as well as at the system level. A full professor of Chemical Engineering, during her tenure at UPRM she was Director of UPRM's Research & Development Center, elected member to the Academic Senate and Administrative Board, Special Assistant to the Chancellor and the Dean of Engineering in charge of strategic alliances, new educational initiatives and outcomes assessment, including coordinating the ABET 2000 accreditation responsibilities. At the UPR system, Lueny was part of the staff of the Vice President of the University of Puerto Rico System, coordinating the implementation of a UPR system-wide institutional research function, and Director of the Curriculum Innovation Center of the Puerto Rico Alliance for Minority Participation (PR-AMP) Project. Lueny was also Project Director for various NASA and NSF multidisciplinary curriculum innovation grants involving strong industry partnerships. A certified ABET evaluator, she has done professional consulting work and is member of various professional and honor societies, among them Tau Beta Pi, Phi Kappa Phi, Sigma Xi, Alpha Delta Kappa, ASEE and AICHE. A founding member of the Puerto Rico TechnoEconomic Corridor, a multi sectorial initiative to foster economic development based on high technology, she is member of the following local, national and international advisory boards: Cal Poly San Luis Obispo CoE Advisory Board, Worcester Polytechnic Board of Trustees, the Southern States Technology Board (appointed by the PR Secretary of Economic Development), Northeastern University's NSF-sponsored Connections Project. More recently Lueny has provided leadership in Puerto Rico in the Island's quest for a knowledge based economy creating the island's Science and Technology Trust Fund which provides funds to sponsor competitive R&D in CIT and Life-sciences for universities and corporations. She is co-founder and member the Engineer of the Americas Task Force, a group leading quality assurance and mobility of professionals in the Americas, and selected to participate in developing the engineering action agenda for the US by National Academy of Engineering.

With over 50 scientific and education papers, Lueny is a member of the Capacity Building Committee of the World Federation of Engineering Organizations (WFEO), member of the Executive Committee of the

International Federation of Engineering Education Societies, the US NSF International Advisory Committee for Science and Engineering, the Pan American Academy of Engineering, the Women in Engineering Programs Advocates Network (WEPAN) Board of Directors and has received various honors during her academic career, including the prestigious Bernard M. Gordon Prize for innovation in engineering and technology education given by US National Academy of Engineering in 2006.