Honored as innovative engineering educators

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Laura Genik and Carl Lira among only 77 in nation selected for NAE symposium

Seventy-seven of the nation's most innovative, young engineering educators are invited to the National Academy of Engineering (NAE) Frontiers of Engineering Education (FOEE) symposium this year – and two are from MSU Engineering.

Laura Genik, an academic specialist – teaching, and Carl Lira, an associate professor of chemical engineering and materials science, were selected from a highly competitive pool of applicants to attend the sixth annual meeting, Oct. 26-30 in Irvine, Calif.

Attendees were nominated by NAE members or deans based on their ability to develop and implement innovative educational approaches in a variety of engineering disciplines. They will come together for the 2-1/2-day event to share ideas, learn from research and best practices in education, and leave with a charter to bring about improvement in their home institution.

“The Frontiers of Engineering Education program brings together top university faculty to explore preparing engineers for the world’s great engineering challenges,” said NAE President Dan Mote. “It is a no-holds-barred look at the front-edge of engineering education.”

Laura Genik

Genik strives for an engaged classroom. “I have used a number of active and engaged learning activities in the classroom throughout my career,” Genik said. “I prefer to have the students working as opposed to me straight lecturing. This has become more challenging as class sizes increase.”

At the FOEE symposium, she will share her ongoing experiences of how to make mega-classrooms small. “My approach is to reach students on a personal level, so I can increase their participation and knowledge base.”

Genik said there is an increasing need for more engineers who are technically competent in an ever-changing technical
“Engineering education is transforming to meet the demand for higher education in the STEM fields,” she said. “It is leading to more blended classrooms, a combination of online work and classroom activities to maximize the use of technology without losing the advantages of the individual learning experience gained from professor and student interaction. The key,” she added, “is accessibility while maintaining rigorous standards for the engineering student.”

Carl Lira
Lira actively integrates technology into education and expects students to use computational tools such as MATLAB in homework assignments. He has been teaching an online course since about 2001. He is coauthor of a widely-used textbook, *Introductory Chemical Engineering Thermodynamics*.

“Improving educational technology will help educators individualize education, allowing students to more quickly make self-assessments and focus their own learning,” he said. “However, using technology for assessment is a major challenge in engineering courses where assessments often involve integration of multiple concepts or decisions on appropriate mathematical modeling.”

Lira is a co-PI on a multi-institutional NSF project developing lexical analysis of written responses, [http://www.msu.edu/~aacr](http://www.msu.edu/~aacr). He is also actively building a library of problems for online assessment of thermodynamics principles, currently in the loncapa environment.

**Related Website:** [NAE Frontiers of Engineering Education](http://www.nae.edu)

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