

The Pre-Engineering Instructional and Outreach Program at the New Jersey Institute of Technology

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Engineering and Engineering Technology education are essential today and influence almost every aspect of our society. Yet, engineering enrollments and the number of engineering degrees awarded continue to decline throughout the United States. The Pre-Engineering Instructional and Outreach Program (PrE-IOP) at the New Jersey Institute of Technology seeks to enlarge the future pool of qualified high-tech workers, including those who have been historically underrepresented, minorities and women.

The PrE-IOP program uses several strategies to achieve this goal, including the development of a pre-engineering curriculum and the training of grade 6-12 teachers. Instructional components developed through this program are aligned to the State of New Jersey Core Curriculum Content Standards to facilitate their adoption in New Jersey's middle schools and high schools. The PrE-IOP program also includes an outreach component that offers career workshops, teleconferences, and summer programs for students.

This paper describes the PrE-IOP program and the strategies it employs. It also describes in some detail Integrated Curriculum Modules developed in the areas of Machines and Energy; Electricity and Magnetism; and Integrating Chemical Engineering into High School Science. In these modules, the participants learn fundamental science and engineering concepts by building simple models and performing experiments which they can duplicate in their classes.