

Industrial Ecology and Natural Systems

ISYE 8803 B

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This course provides training for engineers to analyze and address global energy and environmental problems. The course examines the use of material and energy on the scale of industries, nations, and globally, and the potential for increased efficiency through new technology and new approaches. The course will draw on fundamentals of science and engineering – from conservation of mass to energy engineering, thermodynamics, and climate science – and will train students to develop integrated technical analyses based on science and engineering principles.

There are no prerequisites; a good undergraduate background in engineering or physical science is expected.

Texts:

Most of the course readings will be journal articles. In addition, we will use the following text:

Graedel, TE, and BR Allenby. *Industrial Ecology*. Prentice Hall, 1995.

Topics

Anthropogenic Material and Energy Flows

Basic Industrial Ecology Methods: Environmental Lifecycle Assessment and Economic Input-Output Analysis

Basic, Intermediate and Advanced Back-of-the-Envelope Methods