

## Prof. David DiBiasio: Catalyzing Climate Change in Engineering Education

Most engineering educators would agree that deep learning —where students retain knowledge and understand how to apply it in different contexts— is one goal of an engineering education. Can that learning be improved by integrating liberal arts and engineering? A National Academies study documented the positive effects of integration on undergraduate students including **“improved motivation and enjoyment of learning” and enhanced critical thinking.**\*



We'll present our experiences with the design, implementation, and assessment of integrated learning using three examples. These include a sophomore ChE course project that combines transient mass balances, process safety, ethics, and current geopolitics using a 1980 Titan missile silo explosion; and two transdisciplinary course sequences that combine history, culture, and introductory engineering science. One involves student role playing in the industrial boom of 19<sup>th</sup> century Worcester, MA and wastewater engineering in the developing world, while the other is set in SW Morocco engaging Berber culture, climate change, and fog water harvesting.

**These examples provide hope that integrated learning can be a normal part of the curriculum and can produce students who understand the relationship between people and technology.** Perhaps this is the kind of climate change that engineering educators might welcome.

*\*The Integration of the Humanities and Arts with Sciences, Engineering, and Medicine in Higher Education: Branches from the Same Tree (2018). National Academy of Sciences, Engineering, and Medicine. Washington, D.C.: National Academies Press.*

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