



University of Michigan Provost's Teaching Innovation Prize

2018 WINNER



BARRY BELMONT
Lecturer III
Biomedical Engineering
College of Engineering
belmont@umich.edu

I thank my Co-Instructors Robert Sulewski and Christian Casper, my post-doc compatriot Eric Had, and my inaugural class.

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Telling Human Stories, Creating Human Engineers

Innovation Description

Because much of the work of an engineer has to do with the rigorous application of scientific details, typical engineering curricula tend to focus on making sense of how all these details interrelate mathematically and conceptually. The innovation in ENG 100.500 "Biotechnology, Human Values, and the Engineer" is to couch information within engaging stories that focus on the people affected by engineers. Through in-class dialogue, peer-to-peer interactions, written assignments, and classroom activities, students reflect on the relevance and consequences of engineering topics from the perspectives of patients, poets, singers, students, corporations, Congress, and the body politic. Beyond conveying engineering principles, the personal accounts help students situate technical information within broader communities and begin considering how they, as principled engineers, aspire to effect change in the wider world. Memorable stories also motivate students to digest a full slate of important technical content, including advanced vocabulary, contemporary statistics, and current trends.

This human-centric approach has increased student engagement and allowed students to more readily relate engineering content to their own senses of identity and ethics. This innovation builds on well-established research showing that contextualizing engineering for first-year students can facilitate their persistence in the discipline. As Professor Belmont puts it, "To create the kinds of well-rounded, cosmopolitan, creative, confident, and compassionate engineers the future needs, we're going to have to tell them the kinds of stories that make them stay."

Student Comments

"He taught me that an engineer isn't just a title, but a responsibility to do what's best for the people living on the pale blue dot."

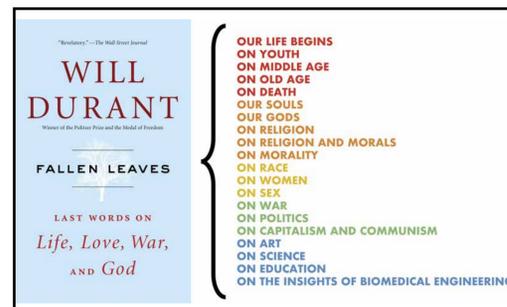
"Beautifully creative and unique, Dr. Belmont's novel approach to teaching is unlike any other style I have experienced before. Deviating from the traditional pattern of simply relaying information and asking us to recall or apply it later, Dr. Belmont emphasizes the human aspects behind the content he presents to us, allowing us to truly learn the material in a fashion that is both memorable and insightful."

"The topics reached from basic engineering to philosophical ponderings to everything in between that may have to be even remotely considered in order to be an excellent engineer."

"Difficult topics: race, sex, religion, death, mental health, and more were all discussed multiple times throughout his lectures."

"My personal favorite and the lecture that impacted me the most is his lecture series on genetic editing, where he interwove the technology used to manipulate genomes with a reminder of our humanity. The human body is an overwhelmingly complex system made of equally complex subcomponents. Just as convoluted and complicated is humanity itself, from ethically questionable experiments to people whose names and hard work are often lost to history."

Examples of Teaching Innovation



The breadth of potential impact on human affairs held by biomedical engineers



Ethical questions raised by biomedical engineering



Example from a series of provocative vignettes regarding technology and identity