Penn Engineering
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Chemical and Biomolecular Engineering

Spring 2023 Seminar Series

BILL HAMMACK

"Reclaiming Engineering in the Minds of the Public: The Unheralded, Underappreciated, and Misunderstood Method that Built Our Modern World"

Wednesday
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3:30 PM
Wu and Chen Auditorium
Levine Hall

Grainger Distinguished Chair
Department of Chemical and Biomolecular Engineering
University of Illinois at Urbana-Champaign

ABSTRACT

Naively the public assumes the products of engineers arise from the scientific method, as reflected in an old joke among engineers about the relationship of science and engineering: "if it's a success, then it's a scientific miracle, if a disaster, then an engineering failure." This joke highlights that successful technologies are invisible: The hallmark of good engineering is invisibility — we rarely think of our furnace, or a jet's engine, or the purity of a pharmaceutical because the methods to manufacture all these have been honed to perfection. This, though, also hides the creative work of engineers because the public assumes the secret of engineering lies in the mastery of arcane realms of knowledge — sophisticated calculus and powerful computing science implemented by a dispassionate, almost mechanical person — yet the power of engineers to change the world lies in their method, a method used long before sophisticated mathematics and computers. This talk lifts the veil to show, in all its glory, the engineering method, which, once understood, highlights the creativity of engineers, demonstrates their work is the pinnacle of human reasoning, and lays a foundation about how to think about technology — how to decide its proper use and aid it in fulfilling its promise. Using rich examples, this talk strips bare the tools often confused for the engineering method – scientific knowledge, mathematical manipulation – to expose what lies at the heart of the method: a surprisingly simple notion called a "rule of thumb."

BIO

Bill Hammack is a Grainger Distinguished Chair in the Department of Chemical & Biomolecular Engineering at the University of Illinois at Urbana-Champaign. He earned a B.S. at Michigan Technological University, and a M.S. and Ph.D. from the University of Illinois at Urbana-Champaign — all in chemical engineering. He taught for a decade at Carnegie-Mellon University before returning to the University of Illinois where he has taught since 1998. From August 2005 to August 2006 he served as a Jefferson Science Fellow at the U.S. Department of State. His work focuses on explaining engineering and technology to the general public. For a decade he broadcast commentaries on public radio, and over the last decade has developed a YouTube channel with over a million subscribers and over seventy million views. His work has been recognized with awards from a diverse group of engineering and science societies, including the "trifecta" of science journalism: the Science in Society Award from the National Association of Science Writers, the Grady-Stack Award from the American Chemical Society, and the Science Writing Award from the American Institute of Physics. And most recently the Council of Scientific Society President's Carl Sagan Award for the Public Appreciation of Science, the American Society of Mechanical Engineers' Ralph Coats Roe Medal, and the Hoover Medal, awarded by a collection of engineering societies. He was elected to the National Academy of Engineering in 2022.