



# Holistic Engineering Education: Beyond Technology

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## Holistic Engineering Education: Beyond Technology

*Holistic Engineering Education: Beyond Technology* is a compilation of coordinated and focused essays from world leaders in the engineering profession who are dedicated to a transformation of engineering education and practice. The contributors define a new and holistic approach to education and practice that captures the creativity, interdisciplinarity, complexity, and adaptability required for the profession to grow and truly serve global needs. With few exceptions today, engineering students and professionals continue to receive a traditional, technically-based education and training using curriculum models developed for early 20th century manufacturing and machining. While this educational paradigm has served engineering well, helping engineers create awe-inspiring machines and technologies for society, the coursework and expectations of most engineering programs eschew breadth and intellectual exploration to focus on consistent technological precision and study. Why this dichotomy?

While engineering will always need precise technological skill, the 21st century innovation economy demands a new professional perspective that recognizes the value of complex systems thinking, cross-disciplinary collaborations, economic and environmental impacts (sustainability), and effective communication to global and community leaders, thus enabling engineers to consider "the whole patient" of society's needs. The goal of this book is to inspire, lead, and guide this critically needed transformation of engineering education.

*"Holistic Engineering Education: Beyond Technology* points the way to a transformation of engineering education and practice that will be sufficiently robust, flexible, and systems-oriented to meet the grand challenges of the 21<sup>st</sup> century with their ever-increasing scale, complexity, and transdisciplinary nature."

-- Charles Vest, President, National Academy of Engineering; President Emeritus, MIT

"This collection of essays provides compelling arguments for the need of an engineering education that prepares engineers for the problems of the 21<sup>st</sup> century. Following the National Academy's report on the Engineer of 2020, this book brings together experts who make the case for an engineering profession that looks beyond developing just cool technologies and more into creating solutions that can address important problems to benefit real people."

-- Linda Katehi, Chancellor, University of California at Davis

"This superb volume offers a provocative portrait of the exciting future of engineering education...A dramatically new form of engineering education is needed that recognizes this field as a liberal art, as a profession that combines equal parts technical rigor and creative design...The authors challenge the next generation to engineering educators to imagine, think and act in new ways. "

-- Lee S. Shulman, President Emeritus, The Carnegie Foundation for the Advancement of Teaching and Charles E. Ducommun Professor of Education Emeritus, Stanford University

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