

# The 21st-Century ENGINEER

A Proposal for Engineering  
Education Reform

PATRICIA D. GALLOWAY, PH.D., P.E.

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# *The 21st-Century Engineer*

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*This book is dedicated to . . .*

*. . .my husband, Kris R. Nielsen,  
who has stood by me in all that I  
have done;*

*. . .my mother, Maudine Frisby,  
who told me anything is possible  
if you put your mind to it; and*

*. . .ASCE, the backbone of our  
profession, which I am proud  
to have served as president.*

“We have to fight this battle upon principle, and upon principle alone. . . . So I hope those with whom I am surrounded have principle enough to nerve themselves for the task, and leave nothing undone that can be fairly done to bring about the right result.”

—Abraham Lincoln, July 17, 1858

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# Foreword

CHANGE IS A CONSTANT IN SOCIETY, AND ENGINEERING helps to drive change and is driven by it. Although change has been evident in every age, this book rightly describes the unique circumstances in which the engineering profession finds itself at this particular moment in history. Patricia Galloway brings to this book the special insights of an engineer who has been at the forefront of the practice of civil engineering for her entire career. She has served in many leadership roles, which provide her with perspectives that others may lack.

During the past five years, several seminal reports identified the special challenges facing engineering today. We live in a time when technology pervades society, a time that should be ideal for engineering. However, engineering has evolved through a process of steadily increasing specialization, which gradually divided the profession into smaller component parts. It is hard to find a central voice to speak for engineering as a whole. Simultaneously, developments that speed communications, such as the Internet, have quickly changed the playing field for everyone, engineers especially. Moreover, in only a decade, the global economy has absorbed the three billion people of India, China, and other developing nations. Engineers in these nations have shown themselves ready and able to take on—at much lower wages—