

“Evolving to a New Normal in Engineering Education”

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Engineers create solutions for people and humanity to address some of society's grandest challenges including sustainability, health, resilient safety and security, and enhancing the joy of living. As a result, there has been an rapid rise in the demand for engineers and computer scientists in the workforce. In the US, the undergraduate enrollment in engineering has almost doubled from 400,000 total enrolled engineers in 2005 to over 700,000 total enrolled engineers in 2015. This rapid growth in interest in various fields of engineering is occurring at a time of exponential growth and interest in the field of computing. To maintain program quality, universities have offset the decline in state contributions with increases in tuition and fees. Because of these stresses, the traditional model of higher education is changing, as demonstrated by the proliferation of colleges (particularly for-profit institutions), hybrid class schedules with night and weekend meetings, and, most significantly, synchronous and asynchronous online learning. The concept of four years away from home—spent living and learning will continue to evolve based on a need to prepare today's students with 21st Century skills and experiences. Residential learning for engineering programs will still have a strong place in higher education, but it may be a more focused or specialized piece of the overall picture. This evolving new normal is driven by the rising cost of higher education, the rise of Generation Z students and their demands for social connectivity, the emergence of online education, and the demand for experiential enhanced learning experiences. How will engineering education evolve to adapt to this new normal? This presentation will explore the history of engineering education in the United States and how engineering education is changing to not only adapt to this new normal, but to leverage and enhance opportunities and experiences for the engineer of the 21st century. Specifically, the modern engineering education paradigm will be discussed including the incorporation of system and design thinking, innovation and entrepreneurship, experiential learning experiences, and finally active learning modalities and online educational initiatives such as Coursera, Udacity, and edX to enhance outcomes for students.