

# **Revolutionizing Mechanical Engineering Undergraduate Curriculum**

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Boise State University

Undergraduate Research Showcase  
Lightning Talk Presentation

Transcript

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## **MICHAL TEMKIN MARTINEZ**

Up next, we have Shelby McNeilly, a Mechanical Engineering student minoring in Applied Math, discussing students shaping their own curriculum and their educational experiences in "Revolutionizing Mechanical Engineering Undergraduate Curriculum." Go ahead, Shelby.

## **SHELBY A. MCNEILLY**

Good morning, everyone. For the past year, I have been working alongside Dr. Donald Plumlee and Dr. Krishna Pakala to co-author a publication for the American Society of Engineering Education Conference. The 21st Century has borne witness to profound technological and societal advancements, some taking the world by storm overnight. In order to accommodate industry demands, companies today must constantly be adjusting and transforming to stay competitive.

For example, we can turn to the global COVID-19 pandemic and how it has created an exponentially-growing virtual work environment. With these quickly-developing requirements comes an expectation of employee experience and skill-sets. For individuals seeking a career in mechanical engineering, moving forward with the tools necessary for success, in this continuously and quickly evolving world, begins with higher education.

This research focuses on the goals and processes used to modernize Boise State University's current Mechanical Engineering curriculum. This will provide undergraduates with an effective foundation for the future. Integrating a change of this magnitude necessitated consideration of a multitude of factors. The primary motivation behind the change is to allow students to pursue more diverse and relevant fields of knowledge. This includes more flexibility within course requirements, as well as offering more availability and degree emphases, incorporating hands-on learning, creating class curricula focused on instilling

proper communication and presentation skills, and merging previously-taught subjects to better assist student understanding.

With these initiatives in mind, the department began revising its mechanical engineering curriculum based on review of peer institutions and educational literature. Faculty, student and industrial advisory boards, and other stakeholders aided in validating the suggested degree program, with the concise analysis of motivations, academic literature, ambitions, and constraints. ASME's Vision 2030 functioned as the elementary foundation for the new design.

During this development phase, several restrictions had to be addressed. The curriculum must continue to follow guidelines provided by the Accreditation Board for Engineering and Technology, align with university degree policies, appease stakeholders, and serve as an overall practical solution.

In simplest terms, colleges are producing under-prepared students. In order to bridge this divide, industry and education must serve as one another's primary stakeholders and work closely together in expressing their individual needs, with motivations, research, and constraints carefully considered. Boise State University's Mechanical Engineering Department strongly believes that they are on the right track to providing their students with the skills and experiences needed to be successful and valuable in their future careers. Thank you.

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