FSE 150: Perspectives on Grand Challenges for Engineering

Overview

Explore global challenges and the impact of engineering on society. Develop an interdisciplinary entrepreneurial mindset to make life more sustainable, healthy, secure, and joyful.

About this course

Are you excited about new technologies that impact every facet of our lives? Are you concerned about the many problems, big or small, faced by our communities on planet earth, and want to help? This course is for you!

This course will provide you with opportunities to explore the global challenges facing society, and to learn about how engineers are making an effort to address these challenges. It will serve as a first step to prepare you to become a well rounded Engineer who is ready to tackle these challenges.

You will hear from experts in many engineering fields talking about the National Academy of Engineering's Grand Challenges for Engineering and their groundbreaking research that is impacting communities of all sizes across the globe. Through this course, you will be equipped with an Entrepreneurial Mindset that complements the technical engineering skill set and drives innovation. The entrepreneurial mindset focuses on exercising your curiosity about the surrounding world in order to identify opportunities, make connections, and create real value for society. This course is also an active introduction to developing an interdisciplinary systems perspective, a new way of thinking and problem solving that is important to address these challenges. Through discussions and activities, you will actively explore how engineering solutions and technologies can be affected by and impact various aspects of society including economics, politics, environment, culture, and human behavior.

Are you ready to make a difference in the world? Do you want to have real impact on society as an engineer? This course is about the global challenges, but it is also about YOU! You will have the chance to identify opportunities that you are passionate about and apply your newly gained skills to develop a futuristic solution that will create value for a community that you care about. You will also identify your path to achieving the necessary competencies to become a successful engineer that makes an impact!

Required prior knowledge and skills

To be successful in this course, we recommend English language fluency and computer literacy.

Learning Outcomes

What you'll learn:

- Interdisciplinary understanding of global Grand Challenges for Engineering
- Awareness of on-going research that addresses the global challenges
- Societal factors that influence the development and implementation of technologies
- Recognize value created by technologies from multiple perspectives

Additional Info

This is a three credit hour course that counts toward the Social-Behavioral Sciences (SB) General Studies requirement at Arizona State University. This course is also a required component of the National Academy of Engineering Grand Challenge Scholars Program at ASU. It is strongly encouraged that you consult with your institution of choice to determine how these credits will be applied to their degree requirements prior to transferring the credit.

Creators

Dr. Haolin Zhu
Haolin Zhu earned her BEng in Engineering Mechanics from Shanghai Jiao Tong University and her Ph.D. in Theoretical and Applied Mechanics from Cornell University, with a focus on computational solid mechanics. After receiving her Ph.D., Dr. Zhu joined Arizona State University as a full time Lecturer and became part of the freshman engineering education team in the Ira A. Fulton Schools of Engineering. She currently holds the title of Senior Lecturer and focuses on designing the curriculum and teaching in the freshman engineering program. She is also involved in the NAE Grand Challenge Scholars Program, the ASU ProMod project, the Engineering Projects in Community Service program, and the Engineering Futures program. Dr. Zhu also designs and teaches courses in mechanical engineering at ASU, including Mechanics of Materials, Mechanical Design, Mechanism Analysis and Design, Finite Element Analysis, etc. She was part of a team that designed a largely team and activity based online Introduction to Engineering course. Her Ph.D. research focuses on multi-scale multiphase modeling and numerical analysis of coupled large viscoelastic deformation and fluid transport in swelling porous materials, but she is currently interested in various topics in the field of engineering education, such as innovative teaching pedagogies for increased retention and student motivation; innovations in non-traditional delivery methods, incorporation of the Entrepreneurial Mindset in the engineering curriculum and its impact.

Amy Trowbridge
Amy Trowbridge received her Master's degree in Biomedical Engineering from Arizona State University (ASU). She is a member of the freshmen engineering education lecturer team in the Ira A. Fulton Schools of Engineering at ASU, focused primarily on enhancing the first year students' experience through the Introduction to Engineering course curriculum. She is also Director of the National Academy of Engineering (NAE) Grand Challenge Scholars Program (GCSP) at ASU, which aims to prepare students to become globally and socially aware engineers who will lead future efforts to solve the world's biggest challenges. She is interested in curricular and co-curricular experiences that broaden students' perspectives and enhance student learning, and encouraging student reflection through the use of digital portfolios.