

FSE 150: Perspectives on Grand Challenges for Engineering



Overview

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.

Course Prerequisites and Requirements

To be successful in this course, we recommend English language fluency and computer literacy. We also encourage you to make sure your laptop or desktop computer meets the technical requirements.

What You'll Learn

- Develop an interdisciplinary understanding of the global engineering Grand Challenges that human societies face in the 21st century
- Describe the NAE Grand Challenges themes, and learn about ongoing research in all Grand Challenge theme areas
- Identify opportunities to create added value in the Grand Challenge areas, and apply customer focused design and an entrepreneurial mindset to conceptualize a potential future solution
- Interpret why (and in what ways) a technology or design solution adds value from multiple perspectives (technological, sociocultural, economic, environmental, global, etc.), and describe a design solution in terms of its societal value (as well as its technical features and function)
- Demonstrate an awareness of societal issues (e.g. sociocultural, political, economic, environmental) that influence and/or constrain engineering solutions

Transcript

This course appears on your transcript identically to how it appears on the transcript of an enrolled ASU student who has taken the course on one of ASU's campuses. This course satisfies 3 credit hours 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 your credit.

Exams and Grading

40%

Projects (2)

20%

ePortfolio

25%

Activities (15)

15%

Graded Discussions

Creators

Haolin Zhu

Senior Lecturer,
Ira A. Fulton Schools of Engineering

Haolin Zhu earned her BSE 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

Senior Lecturer,
Ira A. Fulton Schools of Engineering

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.

