FSE 150: Grand Challenges in 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.

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)

How to Succeed

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.

This course is a required component of the National Academy of Engineering Grand Challenge Scholars Program at ASU.

Earn College Credit

This course appears on your transcript identically to how it appears on the transcript of an enrolled ASU student.

This course satisfies 3 credit hours toward the Social-Behavioral Sciences (SB) General Studies requirement at Arizona State University. It is strongly encouraged that you consult with your institution of choice to determine how these credits will be applied.

In order to receive academic credit for this course, you must earn a grade of "C" or better. You have one year to add the course to your transcript.

Exams and Grading

40%
Projects

20%
ePortfolio

25%
Activities

15%
Graded Discussions

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Time Commitment

This is an asynchronous, online course. This means, while you will have deadlines, you do not need to be at your computer at specific times or participate in live activities.

To be successful in this class, you must view all course pages and complete all graded work by the deadlines indicated. Also, keep in mind that "attendance" in an online course means logging into the platform on a regular basis, checking for course announcements, and visiting and participating in the discussion forums.

This 3 credit, 8 week course requires about 135 hours of work. Therefore, expect to spend approximately 15-20 hours per week preparing for and engaging in this course.

Materials

This course makes use of open educational resources (OERs) provided within the course, **no purchase necessary**.

Graded Assignments

Graded assignments are required and count towards your final grade. Students must submit all assignments via the course site unless otherwise instructed.

Future Solutions Project (30%): This is a five part project which spans across the duration of the course. You will imagine a feasible, future solution to fulfill a need or opportunity related to one or more of the NAE Grand Challenges themes addressed in the course: sustainability, health, security, and joy of living.

Impact of Current Efforts to Solve Global Challenges Research Project (10%): For this assignment, you will have the opportunity to focus on one of the NAE theme areas that interests you most, locate and learn about what is currently being done to address the challenges, and determine the societal impact of possible solutions.

Digital Portfolio (20%): Six assignments; engineers need a professional portfolio to showcase their projects and communicate their diverse skills. You will be creating your digital portfolio using the Weebly platform. Throughout this course, you will use your portfolio as a way to demonstrate your knowledge and give others insight into who you are.

Graded Activities (25%): These 15 exercises allow you to explore and apply the concepts you are learning about in the course on a deeper and more practical level through activities such as case studies and hands-on simulations.

Graded Discussions (15%): 15 graded discussions provide you with an opportunity to apply what you have learned, share the results of graded activities with your classmates, and get their feedback.

Assignment Deadlines

Your instructional team will provide all content and learning activities on or through your course site. It is your responsibility to review all content, fulfill all assignments on time, and ask any questions you have in the designated discussion area. It is also your responsibility to determine the due dates and times for all course assignments according to your time zone. Due to the large-scale format of Universal Learner Courses, late assignments will not be accepted at any point during the course, and we cannot make exceptions.

Course Communication

All communication will take place via the discussion forums and course announcement page. There will be a discussion forum where you can post general questions, comments, and direct inquiries for the instructor and course team. Please use these forums to ensure a timely response. Your instructor will not be able to respond to email.

Additional Information

If you have questions about Universal Learner Courses and how they work, please visit ea.asu.edu or contact our support team at ulcourses@asu.edu.