Grand Challenges Scholars Program

The vision of the National Academy of Engineering’s Grand Challenges for Engineering is the “continuation of life on the planet, making our world more sustainable, healthy, secure, and joyful.” The cross-disciplinary initiative identified 14 challenges that should be addressed to advance that vision, ranging from providing access to clean water, to making solar energy economical, to advancing personalized learning.

It quickly became clear that to meet these challenges, engineers would need to be educated in a different way, and this recognition inspired the creation of the Grand Challenges Scholars Program (GCSP). The program was begun by three US engineering schools—Duke University’s Pratt School of Engineering, the Franklin W. Olin College of Engineering, and the University of Southern California’s Viterbi School of Engineering—that proposed a new education model explicitly designed to prepare engineers to be world changers. The program was endorsed by the National Academy of Engineering in early 2009.

The Grand Challenges Scholars Program (GCSP) is not based on a specific curriculum but rather on expanding the mindsets and skillsets of students so they can make sense of, connect to, and apply engineering skills to global Grand Challenge-like problems. The program provides “the blueprint for the future of engineering education,” offering relevant experiences to prepare students to address the world’s significant challenges of the 21st century. It is based on developing five competencies:

- **Talent Competency:** Mentored research or creative experience on a Grand Challenge-like topic
- **Multicultural Understanding Competency:** Understanding of cultures, preferably through a multicultural/global experience, to ensure cultural acceptance of proposed solutions
- **Multidisciplinarity Competency:** Understanding of multidisciplinary engineering system solutions, developed through engagement
- **Viable Business/Entrepreneurship Competency:** Understanding, preferably developed through experience, of the necessity of a viable business model for solution implementation
- **Social Consciousness Competency:** Understanding that solutions should serve primarily people and society, reflecting social consciousness; service learning promotes social consciousness.
The GCSP has the qualities of a movement rather than a project—engagement is driven by the power of the idea, while local administrative decisions are made in accordance with the practices of the individual university. Each institution creates its own plan for developing the competencies, which is then approved by the GCSP steering committee.

The program is being implemented at more than 50 engineering schools around the world, and dozens more are joining the initiative. Nearly 1,000 engineering students have completed the program to date.

For the movement to grow and thrive, it will be critical for GCSP faculty, administrators, and students across the nation and around the world to connect with each other, collaborate, and engage truly diverse students. The goal is to prepare students for the multicultural, multidisciplinary, entrepreneurial, socially conscious global engagement needed for 21st century engineering, through an educational supplement that is adaptable to any university anywhere in the world. Information is available at the GCSP website (grandchallengesscholars.org).

Meet Grand Challenges Scholars Program Alumni

“The Grand Challenges Scholars Program provided me with a unique rubric through which I integrated entrepreneurship, global focus, and service learning into my chemical engineering degree…. I am currently getting my master's degree in global policy studies, with a concentration in international development at the University of Texas at Austin. The GCSP broadened my horizons on the endless opportunities available to me as an engineer, and propelled me to step outside my STEM comfort zone; as a result, I found new comfort zones in previously foreign fields.”

Amara Ijeoma Uyanna, BS, chemical engineering, Louisiana Tech University, 2016

“The Grand Challenges Scholars Program not only enlightened me to several key, imminent areas of research, but allowed me to participate in aiding the academic community in their resolution. This was very rewarding and motivating for me as an undergraduate student. I have since continued to pursue work that I feel is relevant to the welfare of our community, both global and local. The GCSP helped me take those first steps on the path I’ve now been on for 7 years. Having been under the mentorship of some of the solar industry’s best professors in academia, I’ve been working at two solar cell companies as a development and process engineer.”

Guy Picket, BS, mechanical engineering, Arizona State University, 2012

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