Grand Challenges Scholars Program Info Session

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14 Grand Challenges set by NAE

• Team of esteemed National Academy of Engineering members got together and identified the 14 largest challenges facing society.
  • Including our own Dean Yannis C. Yortsos, USC is one of the original pioneering members.

• WHY?
  The next century poses some challenges for society as populations grow and the demands of those populations grow - need to sustain continuing advancement, while improving overall quality of life.

The vision is about serving people and society.

4 BROAD REALMS –
• Sustainability
• Health
• Security
• Joy of Living
NAE’s 14 Grand Challenges

**Sustainability**
1. Make solar energy economical
2. Provide energy from fusion
3. Develop carbon sequestration methods
4. Manage the nitrogen cycle
5. Provide access to clean water

**Security**
6. Secure cyberspace
7. Prevent nuclear terror
8. Restore and improve urban infrastructure

**Health**
9. Engineer better medicines
10. Advance health informatics
11. Reverse-engineer the brain

**Joy of Living**
12. Enhance virtual reality
13. Advance personalized learning
14. Engineer the tools of scientific discovery

http://www.engineeringchallenges.org/challenges.aspx
https://viterbischool.usc.edu/viterbi-research-nae-grand-challenges/
Why?

Solving the Grand Challenges requires a new kind of engineer and an interdisciplinary approach:

- Create new capabilities
- Come up practical solutions for meeting basic human needs
- Develop new entrepreneurial opportunities
- Reinvent the way humans interact
- Transform systems thinking
- Create a sustainable society
- Be mindful of unintended consequences
- Connect technology and society
- Interact with non-engineering partners
- Design & implement context-sensitive solutions
Grand Challenge Scholars Program

- As of April 2018, **122 universities** in the US have either operational Grand Challenges Scholars Programs (49) or programs in development (73). Internationally, **33 universities** have either operational programs (7) or programs in preparation (26).
  - Started at USC, Duke, and Olin

- Provides an opportunity for undergraduate engineering students to gain greater understanding of the challenges and move towards understanding and creating potential solutions
Goals

• Solving world’s most pressing problems
• Transformative experiences
• Global perspectives
• Join a network of distinguished alumni!
Grand Challenge Scholars Program at USC

- Led by Faculty Director, Professor Najmedin Meshkati
- Students must complete 5 components
  - Talent/Research
  - Multidisciplinary – Engineering +
  - Entrepreneurship
  - Multicultural Competence
  - Social Consciousness – Per Dean Yortsos: “Heroic Engineering”
    - Flexible and easy to accomplish at Viterbi (Engineering +)
- Every other year...opportunities to compete in national or international summit
  - Develop a team oriented business plan focused on a Grand Challenge
- Recognition is given to students at graduation by the school and the NAE
- Students also earn designation on their transcripts
- Albert Dorman Grand Challenge Scholar Award – Top Monetary Award is awarded every year
GCSP Current Student and GCSP Alumna

• Kelly Dickson, Computer Science

• Celeste Goodwin, Mechanical Engineering
The Road to GCSP

- Submit GCSP Application
- Admitted students must attend Orientation
- Admitted students must submit their Grand Challenges Scholars Action Plan
- Must be actively engaged in the program
- Spring Semester Check-in Meetings
  - Freshman, Sophomore, and Junior students must meet with Myra Fernandez, Associate Director of Undergraduate Programs and Women in Engineering to review the progress of their four-year plan

*Senior students must attend the Preparing your Portfolio – Eligibility for GCSP workshop and Submitting Success – How to Write and Prepare your Application Workshop (Fall)*

- Final applications to be recognized as a Grand Challenges Scholar is due in February. Students will be notified in mid-April.
Grand Challenge Scholars Lecture Series

The Grand Challenges Scholars program will host the Grand Challenges Lecture Series on topics related to the themes: sustainability, health, security and joy of living by leading professionals and experts in the field of engineering.

Please complete the following form for suggested speakers and topics.

Dates and times will vary. Must attend at least 4 per academic year.
GCSP and COVID-19

Engineering is at the forefront of addressing societal needs in dealing with challenges posed by COVID-19. In fact, “pandemic” has explicitly been addressed in one the original 14 NAE Grand Challenges, Advance Health Informatics — “How to prepare against a pandemic?”

The National Academy of Engineering and the Grand Challenges Scholars Program has teamed up to tackle the COVID-19 with its Call to Action. The Call to Action brings engineers, medical, and scientific expertise to address our current COVID-19 crisis.

https://www.nae.edu/230195/COVID19-Call-for-Engineering-Action
GCSP and COVID-19

Moreover, since the start of the outbreak in the US, the following noteworthy efforts have been initiated by Viterbi and USC levels, which could provide you with further information concerning opportunities related to COVID-19 research and engagement at USC:

• **Addressing COVID-19 Challenges:**
  [https://viterbischool.usc.edu/covid-19-related-research/](https://viterbischool.usc.edu/covid-19-related-research/)

• **USC Technology Innovation Bootcamp 4HS: Fighting COVID-19:**

• **USC COVID-19 Experts:**
  [https://research.usc.edu/covid19-collab/](https://research.usc.edu/covid19-collab/)
Preparing a Generation to Tackle the Grand Challenges

USC Viterbi TIE Office Presents:

USC TECHNOLOGY INNOVATION BOOTCAMP: FIGHTING COVID-19 FINAL SHOWCASE
July 31, 2020

Register now for the USC Technology Innovation Bootcamp: COVID-19 Final Showcase, hosted by NAE and USC.
What's to come…
Students Innovating for Global Challenges (SIGC)

- Students innovating for global challenges (SIGC) has been formed to foster a community of students from all majors, to further encourage multidisciplinary collaboration and innovation among students, faculty, and alumni.

- Member Interest Form
- E-Board Interest Form
Connections with Alumni

• Join the GCSP LinkedIn page!

• Coming Soon: The GCS Program is launching an informal mentorship group/program via the Viterbi Link platform that is open to all GCSP students and alumni.

Viterbi Link - Viterbi Link is an online mentoring platform that connects current Viterbi students with alumni and/or peer mentors to discuss career, industry, and academic experiences. All current undergraduate students, graduate students and Viterbi alumni may use the platform.
How to Apply

Student Eligibility and Application:

• All interested applicants must submit their Grand Challenges Scholars Application online.

  Application Deadline: Friday, August 28th, 2020.

• In order to be designated a Grand Challenges Scholar, Seniors must apply for official recognition in Fall of their Senior year. *
Questions?

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