

National Academy of Engineering's Grand Challenge Scholars Program at NDSU



Preparing a Generation to Tackle the Grand Challenges

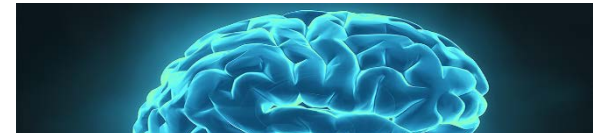
<http://www.engineeringchallenges.org/>

NAE
GRAND
CHALLENGES
SCHOLARS PROGRAM®

NDSU COLLEGE OF
ENGINEERING

Let's begin engineering a path to the future: We will take the Challenges Head-on

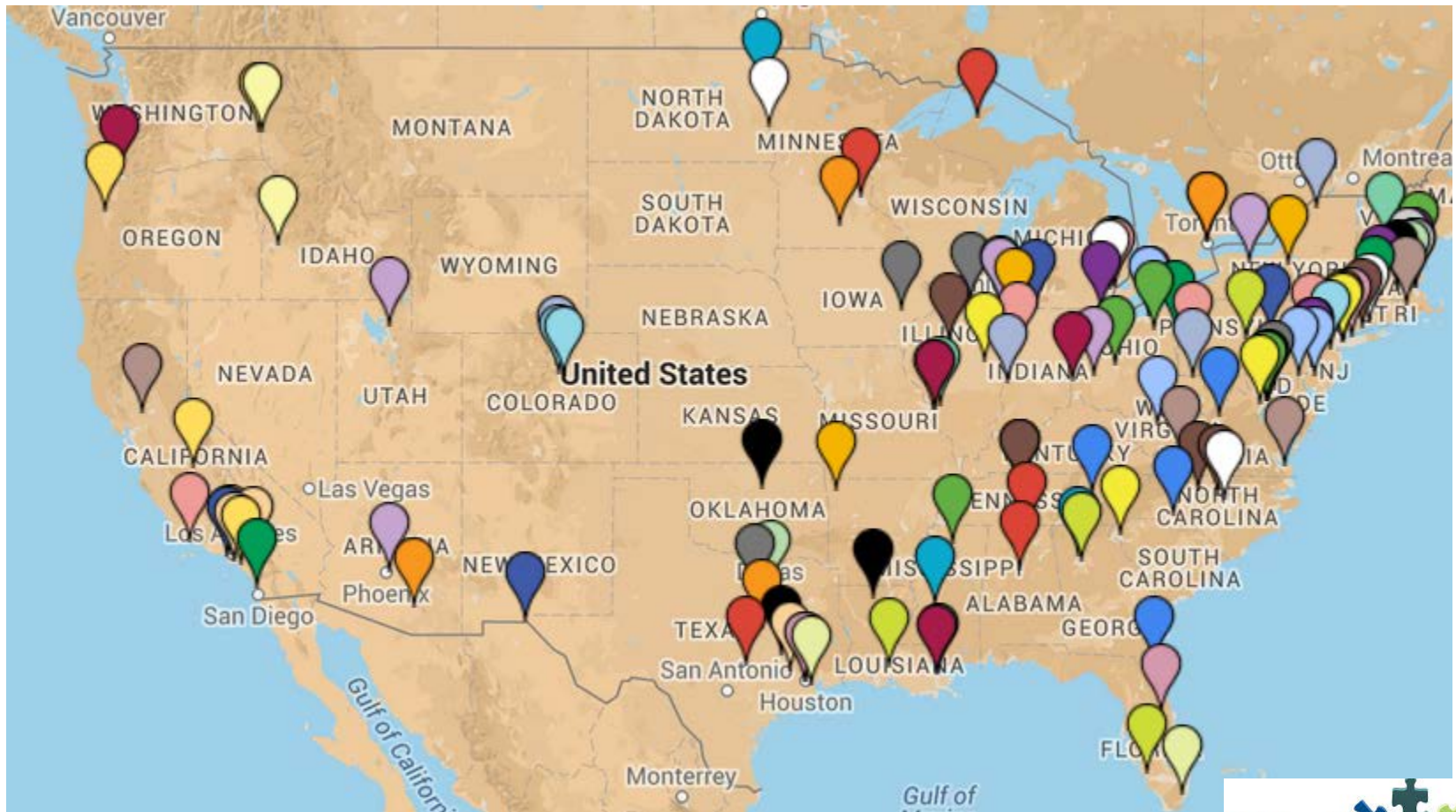
1. Advance Personalized Learning
2. Make Solar Energy Economical
3. Enhance Virtual Reality
4. Reverse-Engineer the Brain
5. Engineer Better Medicines
6. Advance Health Informatics
7. Restore and Improve Urban Infrastructure
8. Secure Cyberspace
9. Provide Access to Clean Water
10. Provide Energy from Fusion
11. Prevent Nuclear Terror
12. Manage the Nitrogen Cycle
13. Develop Carbon Sequestration Methods
14. Engineer the Tools of Scientific Discovery



The Grand Challenge Program

- A “different experience” during your undergraduate studies
- Get experience doing research
 - At the highest level
 - With the best experts in your fields of interest
- Improve your communications skills
- Bring your passion for engineering to solve the real-life problems of tomorrow
- https://www.ndsu.edu/coe/research/grand_challenge_scholars/

Which Schools Have It?



<http://www.engineeringchallenges.org/GrandChallengeScholarsProgram/15784.aspx>

5 Pillars of NDSU GCSP

1. **Research Experience** for *creative technical competency*
2. **Interdisciplinary Curriculum** for *multidisciplinary competency*
3. **Entrepreneurship** for *business competency*
4. **Global Experience** for *cultural competency*
5. **Service Learning** for *social consciousness competency*



NDSU GCSP

- **Engineering Honors Program**
- **It will be on your transcript**
- **A Certificate from the National Academy of Engineers**
- **Employers looking for GCSP Graduates**





ENGR 191: Engineering Grad Challenges Seminar 1 Credit, Class Number 7730

This seminar course will introduce students to the National Academy of Engineers' Engineering Grand Challenges Scholars Program, help students develop their application package for the program, and provide guidance in technical writing and oral presentation.

Upon completion of the course, the students should be able to:

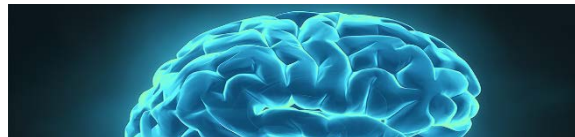
1. Know the grand challenges in engineering
2. Learn about current research and development efforts to address the engineering grand challenges
3. Develop an application package for the Engineering Grand Challenges Scholars Program at North Dakota State University



Thanks!



What can I do to help you understand the program better?





The 11-Step Process

1. Define/decide your career goal
2. Identify your passion (what you like to do!)
3. Identify an issue/problem/challenge which is relevant (helps you achieve your career goals and is “within your passion”)
4. What help do you need to make progress?
5. Identify a potential mentor/mentors who can guide you through (please be open to suggestions on type of challenges you should work on)
6. Start working on the project with your mentor and develop a detailed plan. This will be your Research Essay with some additional inputs.
7. Start jotting down points on (i) the reasons why you are in the Grand Challenges Scholars Program, (ii) your career goals, (iii) your passions, (iv) your life experiences that have helped you to be where you are now, and (v) how your experience can potentially impact others. This will be your Personal Essay with some additional inputs.



The 11-Step Process

8. Complete your Research and Personal Essays, and submit your GCSP application package.
9. Continue to work with your mentor (Research Experience).
10. Get inducted to GCSP at NDSU.
11. Work on the other 4 Pillars of NDSU GCSP.
12. Graduate from NDSU with Honors. Your Honors Degree will be transcriptized. You will receive a certificate from the Chairperson of the National Academy of Engineering (NAE), Washington, DC as well as a medallion from the NDSU College of Engineering.

NDSU GCSP Pathway

YEAR 1

Fall Semester : Promotion of the Program

Spring Semester : ENGR 191 Seminar (Optional)

: Application and Acceptance to the Program

: Project and Mentor Selection



NDSU GCSP Pathway

YEAR 2

Fall Semester : Work with Mentor on Research and Development

: ENGR 310 (Entrepreneurship for Engineers and Scientists)

Or Alternative experience

Spring Semester: Work with Mentor on Research and
Development

: Additional Thematic Course (Optional)

: ENGR 312 Impact of Technology on Society



NDSU GCSP Pathway

YEAR 3

Fall Semester : Work with Mentor on Research and Development
: Additional Thematic Course (Optional)
: Global Outreach/Experience (in Summer)

Spring Semester: Work with Mentor on Research and Development

: Additional Thematic Course (Optional)
: Service Learning Activities



NDSU GCSP Pathway

YEAR 4

- Fall Semester : Work with Mentor on Research and Development
: Thematic Technical Elective (Independent Study)
: Start work on Grand Challenge Thesis
: Present Thesis Idea to Advisory Committee
: Leadership Activity/Learning (ENGR 391 Seminar)
- Spring Sem : Work with Mentor on Research and Development
: Present Thesis Research (Open Forum)
: Leadership Activity/Learning (ENGR 491 Seminar)

