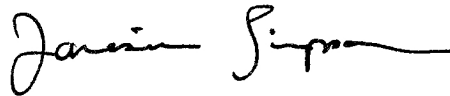


**University of Utah**  
**Grand Challenge Scholars Program Proposal**

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## **GCSP Vision for the University of Utah**

The GCSP at the University of Utah (the U) will provide a solid platform for undergraduate students to broaden their academic experience beyond traditional coursework. Each student will build a diverse portfolio encompassing interdisciplinary, entrepreneurial, global, service, and research experiences relating to a chosen National Academy of Engineering Grand Challenge. We envision the GCSP will grow to include 20 – 30 students for each class of students. These students will apply and be selected before arriving on campus as freshmen (with options for upper classmen or transfer students to join).

At the U, GCSP students will be able to leverage many existing opportunities and resources to help build their portfolios. For example, they may apply for funding to conduct research with a faculty member through the Undergraduate Research Opportunities Program (UROP), which already has a high participation rate by engineering students. As other examples, students may participate in the U's Bench to Bedside (B2B) Medical Device Competition or the Utah Entrepreneur Challenge, which is one of the largest business plan competitions in the nation. In the past six years, the U has been either #1 or #2 in the nation in number of start-up companies created from university research.

One goal of the GCSP is to help build solid relationships between the U's Engineering School and local industries / non-profits already in Utah having goals, research efforts and products relating to a Grand Challenge (ex. GE Healthcare, Pioneer Solar, Evans & Sutherlands computer graphics company, L-3 Communications, and the non-profit Utah Clean Energy which is currently leading the Solar Salt Lake Project funded by the U.S. Department of Energy). The GCSP director and committee will work to build a cohort of companies to sponsor research projects, provide internships, and hire GCSP students upon graduation.

Although the GCSP will not be limited to Honors College students at the U, many of the participating students will likely choose to participate in both the Honors College and the GCSP. The GCSP may thus be used to help build a stronger relationship between the U's Engineering School and the U's Honors College. The Honors College GCSP students will then be able to leverage the additional opportunities afforded by the Honors College, while also potentially creating new opportunities at the U to help Honors College students majoring in any engineering discipline complete an Honors degree. In particular, the Honors College will:

- Help GCSP students connect with internships, study abroad, and other interdisciplinary and service work currently existing through the Honors College.
- Provide honors housing to Honors College GCSP students through a Living Learning Cohort Program to be developed between Engineering and Honors.
- Provide additional coursework possibilities, such as Think Tanks that relate to GCSP topics and could be co-instructed by engineering faculty. (Think Tanks are year-long, for-credit courses that draw students from all disciplines to collaborate with each other, faculty, and community members as they design original solutions to

pertinent social issues. Think Tanks topics vary each year. Engineering and other faculty will be encouraged to propose a Think Tank relating to the NAE Grand Challenges. The fact that the Honors College reimburses departments for faculty teaching and does not retain semester credit hours should help encourage faculty to teach a Think Tank.

The GCSP will be advertised through fliers around campus, web pages hosted on the U's School of Engineering website, the Honors College website, emails, and mailings. The program will also be listed in the Education and Diversity Resources Directory posted on the VP of Research's website. Furthermore, GCSP representatives within each department will champion the program to their students and faculty.

The GCSP has a very high probability of success at the U largely because many programs and opportunities already exist that will help students fulfill the GCSP requirements. There is also already an established culture of service, innovation, and interdisciplinary research at the U. We are excited at the U to initiate a GCSP because it will provide an invaluable experience and opportunity for undergraduates to link the diversity of resources available to them, ignite their creativity, and engage the community and world.

### **Selection of GC Scholars**

To apply for the GCSP at the University of Utah, students will submit a completed on-line application form by July 1 or Dec. 1 or each year. Questions in the application form will include:

1. Why do you want to become a Grand Challenge Scholar?
2. Which Grand Challenge interests you the most?
3. Describe a challenge you have overcome (or are working to overcome) either by yourself or through teamwork.
4. **If you hold the standing of a sophomore or higher, what activities / courses have you already completed that satisfy one or more of the five GCSP curricular components? Please describe how each fulfills the curricular component(s). Only list and describe those activities or courses you would like to apply towards fulfilling the GCSP requirements.**

Responses will be limited to two pages, with the option to include up to two links to multimedia materials. The GC director and GC committee will review the submitted GC Program Plans and will notify students of their acceptance within two months of applying.

To continue in the GCSP, students must:

1. Remain a student in good standing.
2. Submit to the GC director a proposed GC Program Plan, which encompasses the required five curricular components.
3. Build a GC Portfolio including the five GC curricular components that will be completed at least two months prior to graduation.

Students holding the standing of a sophomore or higher as well as transfer students will be permitted to join the GCSP. All students must complete the same application form and submit the Program Plan. An outline of the due dates for the three types of students (incoming freshmen, transfer students, students at the U already of standing sophomore or higher) are listed in the tables below, as well as the expected response dates by the GCSP committee.

For students entering the GCSP as incoming freshmen (starting in the Fall semester):

<b>During the 1<sup>st</sup> year (freshman):</b>	Complete the GCSP application by Dec. 1 or July 1	Notice of acceptance provided by Feb. 1 (for the Dec. 1 deadline) or Sept. 1 (for the July deadline)
<b>During the 2<sup>nd</sup> year (sophomore):</b>	Complete the Program Plan by Dec. 1	Notice of continued acceptance provided by March 1

For students entering the GCSP as transfer students:

<b>During the 1<sup>st</sup> year as a University of Utah student:</b>	Complete the GCSP application by Dec. 1 or July 1	Notice of acceptance provided by Feb. 1 (for the Dec. 1 deadline) or Sept. 1 (for the July deadline)
<b>Within 1 year of applying to the GCSP:</b>	Complete the Program Plan by Dec. 1 or July 1	Notice of continued acceptance provided by March 1 (for the Dec. 1 deadline) or Oct. 1 (for the July 1 deadline)

For students of sophomore standing or higher:

<b>By the next possible application date:</b>	Complete the GCSP application by Dec. 1 or July 1	Notice of acceptance provided Feb. 1 (for the Dec. 1 deadline) or Sept. 1 (for the July deadline)
<b>Within 1 year of applying to the GCSP:</b>	Complete the Program Plan by Dec. 1 or July 1	Notice of continued acceptance provided by March 1 (for the Dec. 1 deadline) or Oct. 1 (for the July 1 deadline)

We anticipate accepting ~12 - 14 incoming freshmen in the first year of the program (about two students per department within the College of Engineering). In subsequent years, about 20-30 new students (about three to four students on average per department) will be accepted into the program.

### **How the Five GC curricular components will be met at the University of Utah:**

Students will create a portfolio encompassing the five components below. Examples of how students may satisfy the components are also included below, but students will be permitted to create their own unique approaches to fulfilling the five components. **An**

exact time duration or commitment to each component is not specified, but students must go satisfy “depth” for at least 2 of the GC components and “breadth” can be chosen for the remaining components. Students will be encouraged to map out how they plan to satisfy each component in their Program Plan to make sure their plans are will satisfy the depth and breadth options.

Examples of how students may satisfy the 5 GC Components:

- **Research Experience** (Depth: At least two full semesters of active research on a project relating to a GC along with participation as a presenter at a State, national, or international conference; Breadth: Two semesters of active research on a project relating to a GC along with participation as a presenter at a University conference (at the department, school, or university level):
  - Apply for funding for up to two semesters from the U’s Undergraduate Research Opportunities Program (UROP) [[www.urop.utah.edu/home.php](http://www.urop.utah.edu/home.php)]: UROP provides assistantships of up to \$1200 for one semester, and up to \$600 for a second semester. The Associate Director of the Office of Undergraduate Research, Jill Baeder, has volunteered to visit the GCSP students each year to describe UROP funding and other opportunities. (Note that 66 students from engineering were supported by UROP last year, so the probability of a GCSP student receiving support is high.)
  - Conduct a senior design project relating to one of the Grand Challenges.
  - Work on a research project not associated with UROP or senior design.
  - Apply to participate in the U’s Undergraduate Research Symposium held annually in April, the Utah State-Wide Conference on Undergraduate Research held annually in February, the National Conference on Undergraduate Research held annually in April, and / or in a poster session to the Utah State legislators annually each January.
  - Participate in a professional, technical national or international conference.
- **Interdisciplinary curriculum** (Depth: complete two courses (If IE courses are chosen, these must be beyond the basic requirements for graduation); Breadth: complete one course (If IE courses are chosen, these must be beyond the basic requirements for graduation):
  - **If/when a LEAP GCSP course is available:** Enroll in a LEAP course for GCSP students [[www.leap.utah.edu](http://www.leap.utah.edu)]: LEAP (Learning Engagement Achievement Progress) is a semester or year-long seminar focused on improving the writing skills of students and helping them transition more confidently to college and play an active role in their own education. For year-long LEAP courses, students stay with the same classmates and faculty member. Most LEAP courses are capped at 30 students, so the GCSP could have its own LEAP section **that emphasizes the Grand Challenges**. LEAP courses fulfill general education requirements and the University’s diversity requirement. **LEAP courses cover engineering ethics, diversity, and other topics and fulfill a social and behavioral science and a humanities course.**

- Enroll in a Think Tanks course [[www.honors.utah.edu/category/engaged-learning/current-think-tanks](http://www.honors.utah.edu/category/engaged-learning/current-think-tanks)] that are related to the Grand Challenges when available: Think Tanks are year-long for-credit courses that draw Honors College students from all disciplines to collaborate with each other, faculty, and community members as they design original solutions to pertinent social issues. Engineering faculty will be encouraged to propose GCSP-related think tank courses to the Honors College. Past example Think Tank courses include: Transparency and Privacy in a Web 2.0 World, Community and Change, The Uneasy Intersection of Law and Medicine, and Alzheimers and Aging.
- Enroll in an intellectual exploration (IE) course in the fine arts, humanities, or social sciences that are in some way related to the Grand Challenges (beyond the two IE courses already required for graduation). Intellectual exploration courses are intended to introduce students to the four broad areas of inquiry found in the university (Fine Arts, Humanities, Social and Behavior Sciences, and the Physical and Life Sciences).
- Enroll in honors courses offered in various departments outside of the students' major, including Math, Chemistry, Biology, Physics, etc.
- Enroll in undergraduate business courses offered by the U's David Eccles School of Business
- Enroll in other courses related on some level to the Grand Challenges offered at the University
- **Entrepreneurship** (Depth: participate in the U's Innovation Scholar Program or compete in 2 competitions or equivalent; Breadth: compete in one competition, complete the course, Engin 5020, or participate in as a speaker in the U's Student Entrepreneur Conference or equivalent)
  - Participate in the U's Innovation Scholar Program [[www.techventures.utah.edu/innovation/about.php](http://www.techventures.utah.edu/innovation/about.php)], which begins with the Innovation Road Map Class (UGS 3050), continues throughout their undergraduate experience through additional courses and extracurricular activities, and ends with them creating an innovation portfolio in the Reflect course (UGS 3051). Graduates are recognized as an Innovation Scholar on their transcript.
  - Compete in the U's Bench to Bedside (B2B) Medical Device Competition [[www.techventures.utah.edu/b2b/](http://www.techventures.utah.edu/b2b/)] which is designed to create an environment where young professionals in medicine, bioengineering, and business can learn to work together in a team dynamic and begin to learn the skills required to design, develop, and commercialize new medical technology.
  - Compete in the Utah Entrepreneur Series techTITANS competition [[www.ues.utah.edu/techtitans/](http://www.ues.utah.edu/techtitans/)] which encompasses the idea stage of creating a business. Winners are awarded \$5000 for development of their idea.
  - Compete in the Utah Entrepreneur Series Opportunity Quest competition that addresses the executive summary stage in business development [[www.ues.utah.edu/oq/](http://www.ues.utah.edu/oq/)]. The top three winners from the U are awarded \$5000, \$3000, and \$2000.
  - Compete in the Utah Entrepreneur Challenge [[www.ues.utah.edu/uec/](http://www.ues.utah.edu/uec/)] that awards \$40,000 to a winning business plan for business start-up.

- Complete the course, Engin 5020, “Emerging Technologies and Business Management,” through the school of engineering.
- Create a venture (for-profit or non-profit) which may be a service organization or a club.
- Work at a start-up or early stage venture that addresses a Grand Challenge topic (this will only satisfy the Entrepreneurship GC curricular component if it can be shown that the student was actively engaged in the entrepreneurial aspect of the venture)
- Participate as a speaker / presenter in the U’s Student Entrepreneur Conference [[www.ues.utah.edu/sec/](http://www.ues.utah.edu/sec/)].
- Compete or participate in other startup competitions and/or entrepreneurship events.
- **Global dimension** (Depth option: At least 1 semester abroad or equivalent; Breadth option: 3 summers or semesters of active participation or 3 courses or equivalent (if completed in the U.S.):
  - Participate or assume a leadership position with Engineers Without Borders
  - Participate in a study abroad program
  - Learn a foreign language and live abroad
  - Enroll in an intellectual exploration course in the fine arts, humanities, or social sciences having a global dimension
  - Enroll in a LEAP section having a global dimension
  - Enroll in an Honors College Think Tank having a global dimension
  - Enroll in an Honors College Scholars Group having a global dimension
  - Enroll in another course having a global dimension
  - Complete an international internship, perhaps through the Honors-Hinckley Track
  - Work at an internationally-minded program that is located domestically
  - Join the newly-created International Engineering Club at the U or work on an international project with Engineers without Borders
- **Service learning** (Depth option: 3 semesters of active participation or equivalent; Breadth option: 2 semesters of active participation or equivalent):
  - Participate or assume a leadership position with Engineers Without Borders
  - Participate and / or plan service activities through the Institute of Electronic and Electrical Engineers (IEEE) or the Society of Women Engineers (SWE)
  - Participate or assume a leadership position with the student or local chapter of the IEEE or SWE
  - Serve as a science fair judge at a local grade school
  - Tutor other students or K-12 students
  - Volunteer at the University Hospital or within another organization, especially if it relates to the chosen Grand Challenge
  - Participate or assume a leadership role in another service-oriented activity.

**How GC scholars will be assessed and tracked at the University of Utah:**

The GCSP Committee will convene or work through email to: (1) select new GCSP students each Winter / Spring / Summer (to join the program each Fall); (2) review the Program Plan of each student; (3) review the Final Portfolios of each student during the two months before graduation. Program Plans and Final Portfolios will be judged based on completeness, relation between the chosen coursework / activities to the chosen Grand Challenge, uniqueness / creativity, and commitment to the program and chosen Grand Challenge. **Specifically, the rubrics on the following two pages will be used to evaluate the Program Plans and Final Portfolios.**

The GCSP Committee will consist of the GC Director and a faculty representative from each Department in the School of Engineering at the University of Utah (seven total). Each GCSP student will visit the faculty representative in their respective department at least once a year to review their progress and plans.



## Final Portfolio Assessment

	1	2	3	4	5
Completeness of the Final Portfolio (including that at least 2 GC components are satisfied by Depth)	Most of the criteria is not met	One of the GC curricular components is not completed, or minor aspects are missing from most of the GC curricular components	One or two minor aspects are missing from more than one of the GC curricular components	One or two minor aspects are missing from one of the GC curricular components	All criteria are met
Commitment: Actively participated in the GCSP each semester, or an explanation for long absences of a semester or longer are provided (if the student is simultaneously enrolled in coursework at the University during those absences)	Long, unexplained period(s) significantly longer than one semester exist during which no contributions are made to the Portfolio	An unexplained period of about one semester exists during which no contributions are made to the Portfolio	An unexplained period of duration less than one semester exists during which no contributions are made to the Portfolio	Some level of participation is documented every semester	Active throughout every semester once admitted to the GCSP
Uniqueness / Creativity	The are no unique or creative elements to the portfolio	The portfolio is not very unique or creative	The portfolio is somewhat unique or creative	The portfolio has some unique and / or creative elements	Highly unique and creative portfolio
The topic of the chosen Grand Challenge is a common theme seen throughout much of the activities / courses chosen to fulfill the GC curricular components	A theme is not present	A theme exists and is present in 2 of the 5 components	A theme exists and is present in 3 of the 5 components	A theme exists and is present in 4 of the 5 components	A theme exists and is present in each of the 5 components

Max Possible Points: 20 (Scores above 15 and higher will be considered passing.)

## Program Plan Assessment:

Only Program Plans satisfying all of the requirements listed below will be accepted.

- Theme: A Grand Challenge has been chosen, and a theme exists centered around the chosen Grand Challenge.
- Completeness: The Program Plan must be complete and clearly indicate how each of the 5 GC components will be met.
- Commitment: The student plans to actively participate in the GCSP each semester unless an adequate explanation is provided.
- The plan has unique or creative elements.