

# Application for NAE Grand Challenge Scholars Program from Tulane University

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## **Introduction, Vision, and Goals**

The School of Science and Engineering (SSE) at Tulane University is unique in that it integrates engineering with math and science, including the biological and behavioral sciences, all within one academic unit. This provides many opportunities for collaborations among faculty and students from the different departments and programs in research, the curriculum, and co-curricular programming. These collaborative efforts prepare our students to meet the challenges of the twenty-first century, a time when scientific breakthroughs are driving technological innovations.

The NAE Grand Challenges Scholars Program (GCSP) provides an opportunity for a select group of our students to be recognized for their commitment to and engagement in research, entrepreneurship, global awareness, service and interdisciplinary approaches to real-world problems. The goals of the GCSP are consistent with the mission of the School of Science and Engineering, which is “to provide outstanding opportunities for learning and discovery in science and engineering and to foster an environment that is student focused, research intensive, interdisciplinary, entrepreneurial, and responsive to the needs of the community”. In addition, the GCSP fits well with the mission of our university whose purpose is “to create, communicate and conserve knowledge in order to enrich the capacity of individuals, organizations and communities to think, to learn and to act and lead with integrity and wisdom”. In late 2014, Tulane’s new president established two task forces to address issues about the Undergraduate Experience and Academic Collaborations. The results of this work emphasized Tulane’s focus on Health and Bio-innovation, Global Studies, and Environment, Energy and Resilience. In addition, Tulane’s new Brain Institute will expand our very strong neuroscience programs with many opportunities for students to engage in research. Further, faculty members in our Computer Science Department are studying aspects of artificial intelligence, computational geometry, and large data processing. Thus, Tulane’s efforts will dovetail nicely with the NAE Grand Challenge Themes of “Energy and Environment”, “Health”, and “Joy of Living” as well as the five program components.

Our students have a unique opportunity to work on projects that affect the area where they will live and study during college. The Gulf South is the center of U. S. energy production and has an economy largely driven by the oil and gas industries. The Mississippi River delta and Gulf of Mexico also have some of the greatest environmental challenges with rising sea levels and loss of wetlands. The New Orleans community still faces emotional and mental health issues that relate to the aftermath of Hurricane Katrina and more recent weather-related disasters. As much as we love our wonderful cooking, we also have very high rates of diabetes and obesity. Tulane is rare in that it has the traditional uptown campus for undergraduate and graduate students, as well as a medical school, primate center, and School of Public Health and Tropical Medicine. New Orleans has two medical schools and two new hospitals, so there are many opportunities for our students to do research and gain clinical experiences related to healthcare. This truly international city with a port at the terminus of the Mississippi River combines local and global influences that our students can embrace and incorporate into their education.

*We envision our GCSP to be a program for outstanding undergraduate students that integrates Science and Engineering and places a focus on the Grand Challenges themes of “Energy and*

*Environment” and “Health”, especially as they pertain to our city and the Gulf Coast region. Our Goals are to have a GCSP that (a) recognizes a cohort of highly motivated students with the potential to excel in these theme areas, (b) provides them with the resources and experiences to complete the requirements of each of the five program components, and (c) equips the GC Scholars to excel in their chosen career paths and make positive contributions to society.*

We acknowledge that every student has his or her own strengths and interests, so we will have programming and mentoring for all students collectively and on an individual basis. We believe that the students who complete Tulane’s GCSP will be well-suited to tackle the 21<sup>st</sup> century challenges. Although we see our strengths in the areas of “Energy and the Environment” and “Health”, the steering committee is open to other ways that a GCSP participant could complete her/his requirements by focusing on another Grand Challenge theme, as long as the five program components are completed successfully.

The Grand Challenges Scholars Program is ideal for Tulane, because many of our students already are involved in various aspects of the five program components. For example:

1. **Research:** Project or research activity engaging a GC theme or challenge:

Many of our students are involved in research in areas related to health and disease, the environment, energy, and other aspects of science and engineering that relate to the Grand Challenges themes.

2. **Interdisciplinary component:** Bridging engineering to other disciplines is essential for solving the NAE Grand Challenges.

Our new president’s inaugural theme was “crossing boundaries” because he is known for his passion for interdisciplinary academic work. Our Grand Challenge Scholars will be able to embrace Tulane’s new and existing initiatives which foster interdisciplinary educational activities.

3. **Entrepreneurship:** Implementing innovation is central to technology development.

Our students’ entrepreneurial spirit is supported by Tulane’s Office of Technology Transfer and Intellectual Property Development which brings cutting edge research to the broadest possible public benefit. This office oversees the Novel Tech Challenge which is open to all undergraduate students with ideas for technological solutions grounded in science and engineering.

4. **Global Dimension:** Global awareness is necessary for working effectively in an interdependent world.

Approximately 30% of our students study abroad either during the academic year or summer and gain valuable global awareness and understanding.

5. **Service Learning:** Working for the benefit of others is the foundation of a civil society.

Tulane is the only Carnegie Classification R1 University with a service learning requirement of all of the undergraduate students. Tulane’s Center for Public Service (<http://tulane.edu/cps/>) works with over 400 community partners that offer opportunities for students to complete their two service requirements.

Additional details below explain how each of the five program components will be met. All fit very well with the beliefs and practices of both the School of Science and Engineering and Tulane as a whole.

Although many Tulane students already take advantage of existing opportunities to excel in some of these components, the Grand Challenge Scholars will be distinct from their non-Scholar colleagues in the following ways:

- (a) The Scholars will have applied and been selected for the program, based, in part, on their passion for delving into the Grand Challenge themes. The Steering Committee seeks to find students who do not necessarily have the highest GPA, but rather, are competent and passionate about one or more Grand Challenge themes and are willing to put in the time and effort to learn as much as they can about the selected topic(s).
- (b) The Scholars will receive individualized mentoring and additional programming available only to participants in the GCSP. One of the goals of the additional programming will be to help the Scholars integrate what they have learned from these five different components and to gain a better understanding of how their work fits within the framework of the Grand Challenges themes. To this end, Scholars will have the opportunity to interact with and gain additional mentoring from alumni and other professionals in settings not available to non-Scholars.
- (c) In their final portfolio, which they will submit at the end of their senior year, the Scholars will articulate their understanding of the Grand Challenge theme that was the focus of their work.

### **GCSP Steering Committee**

The Steering Committee consists of the GCSP Director (who is the Associate Dean of the School of Science and Engineering) plus six faculty members; three from science departments and three from engineering departments. Our first GCSP Steering Committee currently has representatives from Tulane's three engineering departments (Biomedical Engineering, Chemical and Biomolecular Engineering, and Physics and Engineering Physics), and Psychology, Earth and Environmental Sciences, and Cell and Molecular Biology. The members were selected by the program Director in consultation with the department chairs. The Committee has representation from both engineering and science departments, and represents physical, biological, and behavioral sciences. Future representatives may come from our other science departments, but the composition of the Steering Committee will always represent the diversity of our school.

The Steering Committee members' responsibilities will be:

- \* To assist the Director in planning and executing the activities for the Scholars;
- \* To promote the program among their faculty colleagues and interested students;
- \* To review the applications and determine acceptance/non-acceptance of applicants as GC Scholars;
- \* To determine approval/non-approval of GC Scholar portfolio and to ensure that the associated work is related to a Grand Challenges theme;
- \* To assist the departmental mentors and be a resource to the GC Scholars;
- \* To set up policies and standards for GC Scholars.

## **Recruiting Grand Challenge Scholars**

Information about the program will be available to all SSE students at the Open House held during the students' freshman orientation. Consistent with Tulane's emphasis on diversity and inclusion, women and minorities will be encouraged to apply. Presentations will be made at our Society for Women Engineers (SWE), Women in Science (WIS) and National Society of Black Engineers (NSBE) chapters meetings and in first year courses that all SSE students take (e.g., general chemistry, calculus, intro physics). School-wide information sessions will be held at the beginning of each semester to inform all SSE students of the details of the GCSP. A web site will be created that has all of the details about the program, including the application procedure, planned activities, Steering Committee member and mentor contact information, and other details that will provide sufficient information to potential applicants. In addition, both the academic advisors and major advisors will have information about the GCSP that they will share with their advisees. Finally, we hope that students will hear about the GCSP from their admissions counselors when they are considering applying to Tulane!

## **Application and Selection of Grand Challenge Scholars**

Students who express an interest in participating in the GCSP will be advised during their first two years at Tulane by their major and academic advisors and the members of the GCSP Steering Committee as to how they might meet some of the program criteria. [Note: If a student who is not yet in the program is interested in satisfying a program component by doing something that is not listed in the table of eligible components, s/he will be able to petition the Steering Committee. The GCSP Director will serve as the student's mentor through the process of getting the alternate requirement completion approved.]

Students will apply at the end of their sophomore year and will submit an application as well as complete an interview with members of the GCSP Steering Committee. Applicants must meet the following criteria to enter the Tulane's GCSP:

- \* declared major in one of the SSE majors;
- \* completed at least 30 credits towards graduation by the end of the semester;
- \* completed at least one requirement option in at least two of the five program components and have completed their first tier service requirement [thus, some of the work completed during the first two years at Tulane can be used towards completion of the Grand Challenges program];
- \* submitted application form that includes:
  - a 600 word essay about what motivated them to become a GC Scholar and about the Grand Challenge theme(s) upon which they want to focus;
- \* submitted letter of recommendation from an SSE faculty member who is not on the GCSP Steering Committee;
- \* submitted GCSP Plan of Study approved by the GCSP Director, Faculty Mentor, and GCSP Steering Committee.

Note: Although the application form will include a question about the student's overall and major GPAs, these values will be considered along with the other accomplishments and potential achievements of the student, as well as their demonstrated interest in the Grand Challenges themes. Note: GC Scholars also may be a scholar in one of Tulane's other honors programs and would have to meet the requirements for both programs.

Scholars will be selected on the basis of their past performance, potential to complete all of the GCSP requirements, and enthusiasm for being part of a cohort of Scholars. We do not view this as just another honors program (Tulane already has two). Rather, we are seeking highly motivated and engaged students who will embrace the ideals of this program. Thus non-honors students will be encouraged to apply. As stated above, women and minorities will be encouraged to apply. We anticipate having approximately 10-20 Scholars in each cohort, with increasing numbers as the program becomes more established. Currently, of the 1900 Tulane students whose primary major is within SSE, 64.4% are female, 35.6% are male, and 4.7% are African American/Black, 7% are Asian/Asian-American, 7% are Hispanic, 72.8% are white, and 9.1% are Native American, Hawaiian, Pacific Islander, Multi-Racial, or not indicated. As Tulane continues efforts to improve the diversity of our students, we expect that our GCSP cohorts will reflect similar ratios of Scholars as the SSE ratios. However, our goal will be to have cohorts even more diverse than the overall university population, such as through our outreach to WE, WIS, and NSBE.

Once accepted into the program, each GC Scholar will have a faculty mentor from their own major. They will be required to meet with their mentor at least once each semester, and will have several opportunities to interact with the Program Director, Steering Committee members, and other Scholars in their cohort. The selected Scholars will participate in programs designed just for them to help them integrate what they have learned from the five required components and to gain a better understanding of how their work fits within the framework of the Grand Challenges themes.

At the end of the student's junior year, the scholars will submit their first progress report to the Director indicating (a) the requirements they have completed so far; (b) their plan to meet all of their GCSP requirements; and (c) a description of how their work ties in to the GC themes. Scholars will submit a second report in January of their senior year which updates this first progress report. The second progress report also will have answers to reflective questions that get the student to consider how their work has enhanced their learning and how it will help them after they graduate.

### **Faculty Mentors**

Students will select their own research advisors who will guide them in their independent research or honors thesis. In addition, each department will have its own GCSP Faculty Mentor who will work with each of their departmental Scholars to fulfill GCSP requirements. The Departmental Mentor also may serve as the Scholar's research faculty advisor. The Mentors will be selected by the Department Chair in consultation with the GCSP Director and will work with the GCSP Steering Committee to learn about the requirements and how to encourage their mentees most effectively. They will be invited to GCSP activities and will serve in this capacity as long as they and their Department Chair feel is appropriate. The Departmental Mentor advises and approves the Scholar's work, but final approval of the GCSP plan is done by the Steering Committee. Departmental mentors will attend a

training session with the Steering Committee and GCSP Director to learn the rules and nuances of the program. This knowledge will aid the Departmental Mentors in their efforts to guide the scholars in their departments. Serving as a Departmental Mentor or a member of the GCSP Steering Committee will be a part of the faculty member's service when being considered for salary raises, promotion and tenure. We estimate that each Departmental Mentor will have up to three mentees in each cohort.

The Departmental Mentor will be required to:

- \* meet with each GC Scholar in their department at least once each semester to review the Scholar's progress;
- \* attend at least one meeting each year with the GCSP Director and members of the Steering Committee;
- \* attend at least one of the GCSP activities each year;
- \* review and sign the progress report that each Scholar will submit to the Steering Committee;
- \* advise prospective Scholars on an "as-needed" basis regarding GC Scholar requirements and how they might be met with their given major.

### **Funding/ Support**

Tulane's School of Science and Engineering will provide funds for the GCSP activities, including social events, seminars, workshops, and other events that bring together the Scholars, Mentors, and Steering Committee. This includes funding to bring in outside speakers, including honoraria and travel expenses as well as refreshments for the various events. SSE also will pay for GCSP marketing and web design and travel funds for the GCSP Director and faculty to attend the national GCSP events.

Tulane has a few different options for students to receive summer salary for doing research and for funding to travel to national GCSP events and conferences. These funding sources come from:

- \* Newcomb Tulane College (<http://tulane.edu/college/programs/grants.cfm>)
- \* Tulane's Center for Engaged Learning and Teaching (CELT; <http://tulane.edu/celt/funding.cfm>)
- \* Newcomb College Institute (<http://tulane.edu/newcomb/internships/index.cfm>).

Research performed in a faculty member's laboratory normally is funded by the principal investigator's grants, but students also can receive some research funds from CELT.

Students pay their own way to study abroad, but scholarships are available to help defray some of these costs. Any scholarship that a student has received for Tulane tuition will cover tuition and other costs of studying abroad during the academic year. Summer abroad programs are an additional expense to the student, but some scholarships are available for these programs. Our Center for Public Service (<http://tulane.edu/cps/>) handles all of the expenses associated with students completing their public service requirement. Tulane's Office of Technology Transfer and Intellectual Property Development (<http://tulane.edu/ott/>) in partnership with donated funds sponsors the Novel Tech Challenge that works with students developing technological solutions to engineering and science problems. Our students also can participate in activities sponsored by

Tulane's Taylor Center for Social Innovation and Design Thinking (<http://taylor.tulane.edu/>). We anticipate university funding of interdisciplinary courses and other projects in which our GC Scholars will engage. If GCSP participants are unable to secure funding from one of the many resources available to all Tulane students, Tulane's School of Science and Engineering will assist the student with funding for activities needed to complete the GCSP requirements.

### **Unique Aspects of Tulane and the School of Science and Engineering**

As described above, Tulane's School of Science and Engineering (SSE) is unique in that it integrates engineering with math and science, including the biological and behavioral sciences, all within one academic unit. Many of our research projects are collaborative efforts by faculty and their students in different SSE majors. Tulane has chapters of Women in Science and Society of Women Engineers and is establishing a chapter of Engineers Without Borders. Our Novel Tech Challenge which recently completed its second competition is a great example of a successful collaboration between the School of Science and Engineering (SSE) and the Office of Technology Transfer and Intellectual Property Development with direct benefit to students. Service Learning Internship courses such as "Careers in the Health Sciences" and "STEM Education Internship" provide SSE students with opportunities to serve others and gain valuable experiences that will help them in their future professions. Tulane's new Brain Institute (<http://brain.tulane.edu>) provides students with additional opportunities for research on both the uptown and medical school campuses. Our Computer Science Department's focus is at the interface between computer science and other disciplines. Thus, students who complete a coordinate major in Computer Science learn applications of computer science to their primary major. The varied opportunities for integrating knowledge will prepare our students to take on many of the NAE's Grand Challenges.

SSE students benefit from university services such as our

- \* Office of Global Education (<http://tulane.edu/global/home.cfm>) for study abroad
- \* Center for Public Service (<http://tulane.edu/cps/>) to fulfill their service learning requirements
- \* two honors programs  
(<http://honors.tulane.edu/web/default.asp?id=TheHonorsProgram>  
<http://tulane.edu/newcomb/scholars/index.cfm>)
- \* Goldman Center for Student Accessibility  
(<http://tulane.edu/studentaffairs/support/accessibility/>)
- \* SSE student organizations (<http://tulane.edu/sse/academics/undergrad/student-organizations.cfm>)

As our GCSP grows, we envision receiving scholarships targeted at this program that would help defray some of the costs described above (see Funding/Support). Members of our current SSE Board of Advisors have expressed interest in the GCSP and provided good suggestions for ways to enhance the undergraduate educational experience of these students. Some of these suggestions include additional funding for summer research, travel to conferences, and summer internships.



## 5 GCSP Components

GC Scholars must complete at least one activity in each of the 5 GCSP categories and they must complete at least one Low, two Medium, and two High components, (see table below). These categories refer to the different levels of student involvement or engagement, as they vary in the effort and type of engagement that the student must do to complete the requirement. These would be the minimal requirements for successful completion of the program. Some students may choose to complete additional requirements. Because some of these activities are completed in the junior and senior years, applicants in the sophomore year will only have to have completed two lows and their first tier service learning requirement. Scholars will choose the ways they want to fulfill their requirements. They also may petition the Steering Committee if they find an alternate way to fulfill one of the components. Part of the final portfolio will be a description of how the Scholar fulfilled each of the five GCSP Components. Within each box in the table below are multiple ways that the Scholars can fulfill that level of the given component. The Scholar can choose one item in the box and can choose which box to use for each component. As long as at least one Low, two Mediums, and two High levels of the components are completed, the Scholar may choose any combination of ways to complete the requirements.

Here are two examples to illustrate how these levels/components could work:

One Scholar might choose to

- Do an honors thesis (High in Research)
- Study Abroad for one semester (High in Global)
- Take two SSE-based entrepreneurship courses (Medium in Entrepreneurship)
- Complete a non-SSE minor (Medium in Interdisciplinary)
- Complete 20 hour courses to fulfill both 1<sup>st</sup> and 2<sup>nd</sup> tier service requirements (Low in Service)

Another Scholar might choose to

- Take one research methods course (Low in Research)
- Work on a project with a faculty member in the Law School (Medium in Interdisciplinary)
- Complete a foreign language minor (Medium in Global)
- Participate in the Novel Technology Challenge (High in Entrepreneurship)
- Complete a Service Learning Internship (High in Service)

The Interdisciplinary component will be enhanced by the fact that all Tulane science and engineering majors must take at least six classes in cultural knowledge. These courses include classes in the humanities, fine arts, and social sciences, and are chosen from a copious list of available courses taught within the undergraduate college. In addition, Tulane's President is committed to the development of new "360 courses" that will approach relevant topics by examining them from many aspects (taking a 360 degree approach to problem-solving). Further, the group sessions with other GCSP scholars, the steering committee, and invited speakers will be interdisciplinary in nature, as the scholars discuss Grand Challenge themes from different perspectives. For example, bringing together engineering scholars with scholars majoring in psychology, biology, neuroscience, environmental

science, geology, physics, or math, will increase the opportunities for interdisciplinary thought, problem-solving, and critical thinking that relates to the Grand Challenges themes.

## Table of Activities for Completing the 5 GCSP Components

### Activities and Levels of Student Engagement

GCSP Component	High	Medium	Low
<b>Research</b>	<ol style="list-style-type: none"> <li>Honors thesis</li> <li>Independent study in same lab for &gt; 3 semesters</li> <li>REU summer program</li> <li>Team Design Project (research based)</li> </ol>	<ol style="list-style-type: none"> <li>Independent study in the same laboratory for two semesters</li> <li>Two courses in research methods</li> <li>Two semesters serving as a Maker Space “Ninja”</li> </ol>	<ol style="list-style-type: none"> <li>Research methods course</li> <li>Independent study in a laboratory for one semester</li> <li>MakerSpace course (e.g, TIDES 1670)</li> </ol>
<b>Entrepreneurship</b>	<ol style="list-style-type: none"> <li>Novel Tech Challenge</li> <li>Business Plan or Business Model Competition</li> <li>Completion of SISE Minor</li> <li>Venture Well Internship</li> <li>NSF I-Corps</li> <li>Team Design Project (entrepreneurial)</li> <li>Internship in business setting</li> <li>Entrepreneur competition not listed above</li> </ol>	<ol style="list-style-type: none"> <li>Three SISE courses</li> <li>Two SSE-based entrepreneurship courses</li> <li>Two Professional Issues courses</li> <li>Two design courses</li> <li>Two semesters serving as a Maker Space “Ninja”</li> <li>Patterson social innovation dorm (min .two semesters)</li> </ol>	<ol style="list-style-type: none"> <li>One SISE course</li> <li>One entrepreneurship course</li> <li>One ENGP Professional Issues course</li> <li>One MakerSpace course (e.g, TIDES 1670)</li> </ol>
<b>Global</b>	<ol style="list-style-type: none"> <li>Semester or year abroad</li> <li>Foreign language double major</li> <li>International Internship (Summer or Semester)</li> </ol>	<ol style="list-style-type: none"> <li>Summer program abroad</li> <li>Course with international travel (e.g., geology; Western Europe Chem Engineering course)</li> <li>Foreign language minor</li> <li>Wall global awareness dorm (min. 2 semesters)</li> </ol>	<ol style="list-style-type: none"> <li>Working in a lab with an international collaborator</li> <li>Working on research that involves understanding of global issues (e.g., climate)</li> <li>Tutoring student in foreign language</li> <li>Participation in international music activities</li> </ol>
<b>Service</b>	<ol style="list-style-type: none"> <li>Service Learning Internship (approx. 70 hours) + SL course (1<sup>st</sup> tier)</li> <li>SL research project</li> </ol>	<ol style="list-style-type: none"> <li>40 hour SL course for 2<sup>nd</sup> tier requirement (1<sup>st</sup> tier 20 or 40 hours)</li> </ol>	<ol style="list-style-type: none"> <li>Both tiers 20 hour SL courses</li> </ol>
<b>Interdisciplinary</b>	<ol style="list-style-type: none"> <li>Newcomb Scholar</li> <li>Tulane Scholar</li> <li>Research in non-major department (min. 2 sem)</li> <li>Completion of second (non-SSE) major</li> <li>Computer Science coordinate major</li> </ol>	<ol style="list-style-type: none"> <li>Completion of non-SSE minor</li> <li>Three interdisciplinary (INTU) courses*</li> <li>Project with faculty member in law, medical, or business school</li> </ol>	<ol style="list-style-type: none"> <li>Attendance at/written summary of 10 seminars in non-major department</li> <li>One Colloquium (COLQ) course*</li> <li>One Interdisciplinary (INTU) course*</li> </ol>

\* Note: Tulane faculty will be developing additional COLQ, INTU, and “360” courses, per suggestions made by the President’s Undergraduate Experience Task Force.

#### Explanations of terms:

ENGP = Engineering Physics, one of the three engineering majors at Tulane, in addition to Biomedical Engineering and Chemical Engineering

Maker Space Ninjas = The students who help run Tulane’s Maker Space (<http://tulane.edu/sse/research/prototyping/maker-space.cfm>).

NSF I-Corps = National Science Foundation Innovation Corps

SISE = Social Innovation Social Entrepreneurship. Tulane has a SISE minor that is housed in the Architecture school but open to any undergraduate student (<http://taylor.tulane.edu/programs/minor-in-social-innovation-social-entrepreneurship/>). Students also may take SISE courses even if they do not complete the minor. They also may choose to live in the dormitory (Patterson) that has special SISE programming.

TIDES = Tulane InterDisciplinary Experience Seminar. This is Tulane University's distinctive seminar program for all first year students. (<http://admission.tulane.edu/academics/tides.php>)

Note: Work used to complete one requirement cannot be double counted to complete a second requirement. e.g., serving as a MakerSpace Ninja counts either for Research or for Entrepreneurship, but not both. Scholars will indicate on their final portfolio how they met each component requirement.

## **Mentorship, Support, Tracking, and Assessment**

All Scholars will meet at least once each semester with their Department Mentor and will submit a report to the Director at the end of the first GCSP year. This report will be reviewed by the Steering Committee. As progress is being made towards the goals outlined in the proposed GCSP Plan of Study, the Scholar will be allowed to continue in the second year. The student will be expected to track his/her progress in consultation with the Department Mentor. Throughout the program, various workshops, seminars, and social events will be organized for the Scholars which will enhance their educational experience and give them a chance to interact with each other and the GCSP Steering Committee. In January of the Scholar's final year, another progress report will be submitted to the Director that has been signed by the Department Mentor and the Scholar's research supervisor, if applicable. In March or April, all Scholars in the Cohort will present their portfolio work in a special, "culminating GCSP event". The portfolio differs from the two reports that will have been turned in at the end of the junior year and January of the senior year in that it will showcase the projects that the Scholar has completed. This portfolio might take the form of a written manuscript, a PowerPoint presentation, a prototype of an invention, something created in the Maker Space as part of a final course project, an oral presentation, or any other format that relates to the ways that the Scholar tackled her or his Grand Challenge theme. Members of the Steering Committee, Department Mentors, SSE Board of Advisors, and other members of the Tulane and New Orleans community will be invited to attend. By the end of April of the final year, the portfolio will be turned in to the Director, and the Steering Committee will assess the Scholar's portfolio and confirm that the program requirements have been met. The GCSP Director will keep all records of Scholar progress. The GCSP Steering Committee will work with Tulane's Office of Assessment and Institutional Research to implement relevant assessment tools for the Scholars and the GCSP itself.

## **Recognition**

All Scholars who successfully complete the GCSP will receive an official certificate of program completion and a special ceremonial color cord that they can wear at graduation. These will be presented at the Newcomb Tulane College Awards ceremony held every year the day before commencement (<https://tulane.edu/calendar/event-details.cfm?uid=218B6C4A-A8F4-E786-EAA3C9D0402F728F>). Tulane's GCSP Alumni will be invited to the "culminating GCSP event" each spring. The GCSP director will report the names of all graduates of the program each May to the national GCSP Steering Committee.