Grand Challenge Scholar Programs Proposal:

Oregon State University College of Engineering

Oregon State University College of Engineering Dean: Scott A. Ashford

Signature: ___________________________ Date: 23 - APR - 2018

Oregon State University Grand Challenge Scholars Program Director: Scott N. Paja

Signature: ___________________________ Date: 5 - 7 - 18

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Mission & Goal
The mission of Oregon State University College of Engineering Grand Challenges Scholar Program (GCSP) is to provide a transformational experience that produces graduates committed to building inclusive and collaborative communities where they lead innovation and drive breakthroughs that improve the world.

Oregon State College of Engineering’s strategic plan 2015-2020 serves as our overarching GCSP compass. This plan is guided by the vision to create a better future and anchored in the mission to transform lives and enhance society through impactful education and research.

Recruitment
The College of Engineering at Oregon State University is the eleventh largest school of engineering in the United States (by undergraduate enrollment). With over 7,500 undergraduate students and 14 majors, we anticipate a strong pipeline of Grand Challenge Scholars.

To position the OSU GCSP for success, we have identified optimal alignment with our existing College of Engineering Leadership Academy program. The Academy will serve as the foundation for the GCSP, providing a healthy base of ready participants from the program membership of over 325 high-achieving students across disciplines. With this strategic alignment, growth of the Academy and the launch of the OSU GCSP will mutually benefit each other.

The Leadership Academy is a highly structured co-curricular experiential learning program developed and delivered in close collaboration with key industry partners. The program structure expands perspectives, accelerates development of dynamic non-technical skills, increases competitiveness for employment, and propels the future success of graduates. The Academy is comprised of three core aspects: 1) developmental workshops, 2) mentoring interactions, and 3) a professional experience. The program’s workshops are organized across five key competency areas. Students engage in a minimum of three workshops in each of these five program “Pillars”:

<table>
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<tr>
<th>Leadership Academy Pillars</th>
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<tr>
<td><strong>ETHICAL</strong></td>
<td>Leaders espouse humility, honesty, and ethical practices. They are committed to civic engagement and dedicated service to others. Leaders have strong morals and put their integrity ahead of personal or professional gains.</td>
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<td><strong>PURPOSEFUL</strong></td>
<td>Leaders are flexible life-long learners who attack each day with purpose. They are introspective and aware of personal strengths, weaknesses, beliefs, and biases. Leaders’ honest self-understanding allows them to make meaningful life and career decisions.</td>
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<td><strong>PROFESSIONAL</strong></td>
<td>Leaders are polished individuals. They present strong personal brands, maximize networking opportunities, and positively influence others. Leaders exhibit tact and business savvy to skillfully navigate personal and organizational dynamics.</td>
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<tr>
<td><strong>INCLUSIVE</strong></td>
<td>Leaders are globally prepared individuals who value difference. They seek out diverse team members and ensure inclusive environments where the convergence of cultures and ideas drive innovation.</td>
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<td><strong>COLLABORATIVE</strong></td>
<td>Leaders articulate compelling vision and inspire others. They draw from many perspectives on leadership to guide their practice, using exceptional communication skills, humor, and emotional intelligence to resolve conflicts and build relationships. Leaders understand group dynamics and empower others to solve complex problems.</td>
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**Application**
Any student who is a member of the Leadership Academy, with 12 or more completed credits at Oregon State University, and a GPA of 3.0 or higher is qualified to apply for GCSP. The Oregon State University GCSP seeks to attract students from all undergraduate majors for maximum interdisciplinary interaction.

To apply to become a GC Scholar Participant, a student will:

1) Be accepted and enrolled as a member in the Leadership Academy;
2) Have completed 12 or more academic credits at Oregon State University and GPA of at least 3.0. If accepted:
   a. Maintenance of minimum GPA and OSU student status are subsequently required for ongoing participation, completion, and recognition as a Grand Challenge Scholar.
   b. One term probation will be enacted should a student fall below minimum status requirements, followed by dismissal from the program if the minimum is not regained following this probationary term.
3) Discuss the GCSP with program staff to explore benefits, requirements, and structure;
4) Submit a completed GCSP application including:
   a. A personal essay that includes a rationale for pursuit of the Grand Challenge Scholar Designation, as well as the Grand Challenge the student intends to focus on.
   b. A proposed GC Program Plan that outlines how the student will complete each of the five components as outlined in the GCSP, as well as demonstrate intellectual and thematic connectivity across the five program components and a selected Grand Challenge theme.
   c. One identified industry mentor who has agreed to participate in this role.

**Steering Committee**
The Steering Committee is an interdisciplinary team that works to ensure the success of the Grand Challenge Scholars Program at Oregon State University. The program committee is comprised of the Assistant Dean for the College of Engineering (the GCSP Director), Faculty Representatives from each of the college’s five schools, Industry Stakeholders, program staff, and student representation.

**Mentors**
To build a resourceful mentor group, Faculty/Staff and Industry Partners will be included. Industry Mentors will be identified from an existing “Mentor Pool” for the Leadership Academy (currently over 300 active participants) as well as Industry Advisory Boards and Alumni Groups from across the college.

**Responsibilities**
Each OSU Grand Challenge Scholar Participant will have a Grand Challenge Faculty/Staff member designated as a mentor to counsel and direct the completion of their Program Plan as well as an Industry mentor to help provide outside perspective.

This guide outlines what the Mentor needs to do with the GC Scholar Participant:

1) Review Program Plan. The Faculty/Staff Mentor makes sure Participant’s Program Plan demonstrate intellectual and thematic connectivity across the five GCSP components and a Grand Challenge theme or problem;
2) Meet a minimum of once per year with the Participant to keep updated on Participant’s progress (continuous contact/quarterly check ins will be strongly encouraged as preferred);
3) Review annual progress report. The GC Scholar Participant should submit an Annual Report to the Industry Mentor each year by August, outlining their accomplishments for the past academic year and a plan for progress that will be made in the upcoming academic year;
4) Upon completion of their Program Plan, Both Faculty/Staff and Industry Mentors provide a recommendation to the GC Steering Committee verifying that the Participant satisfactorily complete the program requirements.
Funding/Support
The OSU College of Engineering is committed to the successful implementation of the GCSP. Resources have been invested to hire a full-time staff member who will be responsible for supporting program coordination as well as a new physical facility space designated the “Leadership Center” to provide a home for GCSP participants and activities. The staff member’s campus office is collocated in the Leadership Center.

In addition to the significant investments already made, the college is committed to ongoing support for staff and the GCSP Director to participate in GCSP meetings and events, to subsidize travel costs for interested GCSP participants to also engage in these activities, to support refreshments for GCSP activities on campus and in the Leadership Center, professional development stipends for GCSP participants to capitalize on research, service learning, and entrepreneurial activities, as well as executive focus in fundraising initiatives to secure additional support for future scholarship that would enable expanded access to cost-added activities GCSP participants may opt to pursue (such as study abroad and courses) in route to meeting the Oregon State University GCSP components.

NOTE: all five components have proposed options for completion that can be pursued at no additional cost to participants—these scholarships would simply broaden options for all students regardless of financial background.(

Program Plan
Each applicant must develop a Program Plan that addresses the five GCSP components as demonstrated below specifically. The Program Plan must also demonstrate intellectual and thematic connectivity across the five GCSP components and a Grand Challenge theme or problem.

Research Experience
Through the form of presentation or paper, the GC Scholar Participant will demonstrate their competency in terms of research experience that is relating to a Grand Challenge theme or specific Grand Challenge problems.

Interdisciplinary Curriculum
All students fulfill a Baccalaureate Core as part of their degree. The Baccalaureate Core curriculum represents the foundation for students’ success in the modern world. Informed by natural and social sciences, arts, and humanities, the Baccalaureate Core requires students to think critically and creatively, and to synthesize ideas and information when evaluating major societal issues. Importantly, the Baccalaureate Core promotes understanding of interrelationships among disciplines in order to increase students' capacities as ethical citizens of an ever-changing world.

Entrepreneurship
OSU Grand Challenge Scholars need to be prepared to translate research out of the lab and into a real-life product through either co-curricular activity or curricular course. Students will choose one option out of the three below:

1) Compete in a business competition through the OSU College of Business and OSU Accelerator;
2) Participate in the OSU Advantage Accelerator’s Iterate, Accelerate, Launch Program;
3) Enroll in one curricular course for one academic term, examples include: BA 260 Introduction to Entrepreneurship, BA 362 Social Entrepreneurship and Social Initiatives, BA 363 Technology and Innovation Management, and BA 468 Technology Commercialization.
**Multicultural Dimension**

Grand Challenge Scholars need to develop a global perspective necessary to address challenges that are inherently global, as well as to lead innovation in a global economy through either co-curricular activity or curricular course. Students will choose one option out of the three below:

1) Volunteer in one of the following two programs for one academic year: INTO OSU Cultural Ambassador Conversant Program that internationalizes GC Scholar Participants’ education at OSU and gain cultural diversity experience here on campus, or volunteer in OSU International Peer Mentoring Program that prepares GC Scholar Participants to be responsible and engaged leaders for a global society by enhancing academic success along with cultural and social integration;

2) Gain an international experience through any Study Abroad Program below: OSU University Exchanges, OSU Faculty-Led Programs, OSU Departmental Programs, International Internships with IE3 Global, Research Abroad;

3) Enroll in one curricular course for one academic term with 40 credit hours completed; examples include: HEST: Humanitarian Engineering Courses, ES 451 Theories of Race and Ethnicities, ES 460 Ethnicity and Social Justice, and ANTH/ES/WGSS 373 Approaches to Social Justice.

**Service Learning**

OSU Grand Challenge Scholars should bring their technical expertise to address community identified needs while engaging students in hands-on, experiential learning about issues of local concern with ramifications for the grand challenges. A student must complete 60 service learning hours confirmed through the OSU Center for Civic Engagement that is partnering with the College of Engineering for the GCSP at OSU. Service Learning hours can be logged from course requirements in Humanitarian Engineering or similar classes.

*See Appendix A for summary of options students have for completion of program components.

** Activity used to satisfy requirements for one program component may not be used to satisfy any other; “double-dipping” to complete component requirements is strictly prohibited.

**Tracking, Support, and Assessment**

The GCSP at OSU will be incorporated with the College of Engineering’s well-established Leadership Academy. As such, electronic program management system (“Portal”) will be used to ensure tracking of GCSP progress and to support students in achieving forward momentum towards completion. The system will automate tracking and enable timely data-based support and/or intervention (when necessary). Members of the GCSP will simultaneously be members of the Leadership Academy and have a home in the “Leadership Center” where program staff are housed for continuous check in and support.

**Recognition**

Participants must complete a GCSP portfolio using the aforementioned electronic program management portal to fulfill the requirements of the program. The portfolio will contain a representation of the work that the program participant has completed and will demonstrate how the interconnected components align with the chosen grand challenge. The portfolio is constructed on an ongoing basis as the participants completes requirements in the GCSP. Upon the successful completion of the Portfolio, including a senior-design capstone presentation on scholarship and project experiences, and recommendations from both the Faculty/Staff and Industry Mentor, the Steering Committee will verify the Participant has satisfactorily completed the program requirements. The Participant will be designated an Oregon State University College of Engineering Grand Challenge Scholar upon graduation and receive recognition from the National Academy of Engineering.
## Appendix A: Summary of Component Completion Options

### RESEARCH EXPERIENCE
Student pursues selected GC through lens of Senior Design Capstone Project and include a supplemental demonstration of understanding (Presentation, Video, Written Essay, or similar)

**Example:**
Through an oral TED-talk style presentation, a student demonstrates competency positioning impact of project as it relates to achievement of the "Restore and Improve Urban Infrastructure" GC.

### INTERDISCIPLINARY CURRICULUM
Student completes interdisciplinary core with 15-credit “Skills” courses in writing, speech, mathematics and fitness; 24-credit “Perspectives” courses in Biological Science, Physical Science, Cultural Diversity, Literature and Arts, Social Processes and Institutions and Western Culture; 3-credit “Difference, Power, and Discrimination” course; 6-credit “Synthesis” courses in Contemporary Global Issues and Science, Technology and Society; and 3-credit “Writing Intensive” course.

### ENTREPRENEURSHIP
Student completes approved credit-bearing academic course or co-curricular experience.

**Examples:**

<table>
<thead>
<tr>
<th>Curricular Options</th>
<th>Co-Curricular Options</th>
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<tbody>
<tr>
<td>BA 260: Introduction to Entrepreneurship</td>
<td>OSU Next Great Startup Competition</td>
</tr>
<tr>
<td>BA 362: Social Entrepreneurship &amp; Initiatives</td>
<td>OSU Advantage Accelerator Iterate, Accelerate, Launch Program</td>
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<tr>
<td>BA 363: Technology &amp; Innovation Management</td>
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<tr>
<td>BA 468: Technology &amp; Commercialization</td>
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### MULTICULTURAL DIMENSION
Student completes approved credit-bearing academic course or co-curricular experience.

**Examples:**

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<tbody>
<tr>
<td>HEST: Humanitarian Engineering</td>
<td>International experience (study abroad, faculty led summer experience, etc.)</td>
</tr>
<tr>
<td>ANTH/ES/WGSS 373: Social Justice</td>
<td>OSU International Peer Mentoring Program</td>
</tr>
<tr>
<td>ES 451: Theories of Race and Ethnicities</td>
<td>OSU Student Organization Experience Abroad (such as Engineers Without Borders)</td>
</tr>
<tr>
<td>ES 460: Ethnicity and Social Justice</td>
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### SERVICE LEARNING
Student completes 60 logged service learning hours with experience sites confirmed through the OSU Center for Civic Engagement; student completes subsequently completes reflective component throughout duration of experience in electronic portal system.

**NOTE:** Activity used to satisfy the requirements for one program component may not also be used to satisfy any other; “double-dipping” to complete the Grand Challenge Scholars Program component requirements is not allowed.