College of Engineering
2014-15 Provost’s Hiring Initiative

Requested Addendum: Faculty Positions Allocated for Student Success

The College of Engineering has seen significant growth in students over the past five years, nearing 7000 undergraduate and graduate students enrolled. Faculty resources have been added over recent years to address that growth, but to date those resources have not allowed us to ‘catch up’ with student demand in a way that ensures a continued high quality educational experience. The Provost Hiring Initiative (PHI) will enable continued excellence in teaching and learning and efforts aimed at equalizing the success gaps between student populations.

This particular PHI also gives us the opportunity to distinguish OSU’s engineering programs from others across the US by focusing on diversity in terms of faculty and student body recruitment. The profession of engineering and its associated technical disciplines are predominantly male and white across the nation. OSU has not escaped this national challenge as shown in Table 1.

Table 1: Engineering faculty and engineering student enrollment demographics. Student data collected from OSU Institutional Research for Fall 2014. National averages collected from ASEE for 2013. Native category includes American Indian, Alaskan and Native Hawaiian.

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Native</th>
<th>Black</th>
<th>Hispanic</th>
<th>Asian</th>
<th>Two or More Races</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSU UG</td>
<td>22.2%</td>
<td>0.4%</td>
<td>1.0%</td>
<td>6.2%</td>
<td>9.1%</td>
<td>5.8%</td>
</tr>
<tr>
<td>National UG</td>
<td>19.5%</td>
<td>0.6%</td>
<td>4.6%</td>
<td>10.5%</td>
<td>10.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td>OSU GRAD</td>
<td>4.2%</td>
<td>0.0%</td>
<td>0.2%</td>
<td>1.9%</td>
<td>2.6%</td>
<td>1.5%</td>
</tr>
<tr>
<td>OSU T/TT faculty</td>
<td>14.2%</td>
<td>0.6%</td>
<td>1.2%</td>
<td>6.8%</td>
<td>21.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>National T/TT faculty</td>
<td>14.4%</td>
<td>0.2%</td>
<td>2.4%</td>
<td>3.4%</td>
<td>23.4%</td>
<td>-</td>
</tr>
</tbody>
</table>

This PHI addendum describes the practices and programs we have in place and are planning to adopt that will further increase the diversity of our faculty, and impact our student body to improve enrollment of underrepresented groups.

The basis of this proposal is to place the responsibility of diversity on existing faculty with proven expertise in this area and to hire new faculty from diverse backgrounds. The new faculty will be able to backfill some of the existing faculty’s responsibilities while also playing an important part in recruiting, teaching and engaging students with a more diverse set of racial and ethnic backgrounds.
Summary of existing programs to advance and equalize student success

We currently dedicate one full-time staff and partial efforts of five college advisors toward academic success programming in the college. The following list describes existing programming within the College of Engineering aimed at improving student success for all student populations.

- COE administers an extended warning/probation/suspension system at a higher GPA trigger (2.25) in the professional school. The trigger force the student to meet with an advisor to discuss academic challenges and refer to appropriate resources and develop a academic success agreement before the student can register.
- Student success programs for students within the College’s living-learning community (Hawley-Buxton Residence Halls), and coordinate success initiatives aimed at improving academic performance and retention in consultation with residential education initiatives.
  - For Example: Career Fair Prep Workshop, LinkedIn Workshop, collaboration with the Academic Learning Assistance (ALA), and advertising of HUB study tables & tutoring
- COE student success center (“The HUB”). This includes:
  - Creation and implementation of programming related to academic success, career exploration and development, international programs, first-year program, and co-curricular opportunities. An average of 14-19 workshops, and weekly study tables/tutoring for 6-10 engineering courses are offered each quarter. Academic Coaching (see below) and International Programs are also supported at The HUB.
- COE Academic Peer Coaching program including hiring, training, and supervising 6-10 student coaches. This includes research on best practices in Academic Coaching and other retention initiatives, establishment of tracking and assessment procedures for the Academic Coaching program, and regular evaluation of program impact and effectiveness. Collaboration with OSU’s Academic Success Center to cross-train and ensure program consistency is continuous.
- The COE is represented on select OSU committees and task forces related to first-year experience programs and retention, early alert systems, academic recovery models, retention within the college, and persistence to degree completion. Such committees and task forces include, but are not limited to, First-Year Advising Council, University Council on Student Engagement & Experience, and Academic Standing Committee.
- The COE was an early adopter of the STAR (Students Taking Academic Responsibility) Program, aimed at reducing the time to recovery for first-year students in negative academic standing.
  - The Program provides a structured and systematic intervention aimed at identifying academic resources and strategies beyond what is offered through the College of Engineering academic coaching program.
  - Cross-training of first-year advisors will begin in Spring 2015 to ensure all central advisors are skilled at administering the Program in a consistent and impactful manner.
- Enhance partnerships with target academic departments with historically high failure rates in foundational engineering courses:
o A formal partnership between the COE and Physics Department will be in effect beginning in Spring 2015 to provide greater depth and breadth of academic support for PH 211
o Participate in “Chemistry Checkpoints”, documenting early alert notices from CH instructors at pivotal points in the term
o ENGR 199—Foundations for Engineering Success: To strengthen the major commitment of first-year engineering students and improve University retention rates, an innovative course was developed in Fall 2013 linking student development theory and engineering college-knowledge. ENGR 199, Foundations for Engineering Success, is targeted at first-year pre-engineering students who enter with math proficiency levels below College Algebra. The successful retention results from the pilot year created administrative support to expand the number of ENGR 199 sections to three for Fall 2014 for a student enrollment of 82 students.
• Consultation and collaboration with Instructors of ENGR 111 (General Introduction to Engineering Course for first-year pre-engineering students) on the inclusion of academic success skills within the course curriculum.

We currently have two full-time staff devoted to recruiting and equalizing success of student populations underrepresented in engineering. One-half of the time of one of these staff has a broader objective of underrepresented groups in STEM, not just engineering. In addition to developing and implementing programing, staff secure additional funding through competitive grants and Engineering donors to fund programing. The following list describes programming specifically aimed at closing the academic success gaps of underrepresented populations.

• 60 URM students attend a 2-week pre-fall term orientation program (LSAMP Summer Bridge) focused on community development, campus resources, faculty research and networking, career education. Eight current URM students serve as mentors, and participate in a training/leadership development program.
• Approximately 150 incoming URM STEM students attend the LSAMP Academy. The goal of the 2-day academy is to introduce first-year and transfer students to the “pillars” of LSAMP (academic excellence, community development, and experiential learning) that cannot be accommodated in the LSAMP Summer Bridge. These first two programs are funded through a combination of grants (not the LSAMP grant) and STEM Colleges.
• Annual LSAMP conference: Support for attendance for URM students participating in UG research.
• 80 incoming first-year women students attend a 2-day pre-fall term program (Women in Engineering Orientation Program, focusing on community development, meeting mentors, and campus resources. Ten current women students serve as mentors.
• Two one-credit orientation classes focused on community building and academic success are offered to first year URM students underrepresented in STEM and first year women students in engineering.
• Two student lounges for building community and studying: URM students STEM (LSAMP) and Women Students in Engineering.
• Structured Study Tables are offered in lounges for targeted courses: math, chemistry, physics, and computer science.
• Funding for undergraduate research is provided for through a variety of mechanisms, including grants obtained by COE staff. STEM Leaders: NSF program funding 40 first year URM STEM and Women in Engineering for 3 terms of UG research. WME Scholars: funding for first-year URM and Women. SemiConductor Research Program: Funding for URM and Female engineering students to participate in a paid research experience. STARS Leadership Corps: NSF funded program, Broadening Participation in CS: ten students funded for CS outreach, or UG research.
• Financial support and advising for diversity student organizations: Society of Women Engineers, Society for Hispanic Professional Engineers, National Society of Black Engineers.
• Specific scholarships targeted to underrepresented populations: Navarrette: 4-year $64,000 award, Gilliland: 2-$1,000 to female interested in robotics, Women in EECS: $1,000 to all first year females enrolling in EECS, LSAMP: awards for 10 URM students.

College plans to move culture and climate to align with institutional student success and diversity and inclusion objectives

COE will continue to support academic success and diversity programing at current or higher levels in the future. We will increase our efforts in assessing the effectiveness of programing, discontinue ineffective programs, and initiate new strategies. We have designed expanded facilities for academic success programing and staff in Johnson Hall, which is planned to open in Fall 2016. The facilities in this new building include almost 20,000 sq ft for central advising and students services offices, URM and women community lounges, active learning designed classroom, and space for academic support programing and informal use by students. We are preparing to expand our academic success programing to realize the potential of the new facility.

The College of Engineering is currently in the final stages of a 9-month long strategic planning process. Goal 1 of the draft Strategic Plan currently states that the COE will become a recognized model as an inclusive and collaborative community. Several tactics (described below) to advance this goal are supported by the College leadership, and planning is underway for implementation. Additional tactics will be implemented with the completion of the strategic plan.
• We will work with the appropriate partners on campus to deliver inherent bias training to (1) all faculty and staff search committees in the college as part of their first planning meeting, and (2) School and College Tenure and Promotion committees. We plan to have this process in place for fall 2015 committees.
• The Office of Women and Minorities in Engineering will develop a plan for retention programming for diverse graduate student populations (previously the Office has focused efforts on undergraduate students).
• Michelle Bothwell, CBEE faculty, is planning to offer a Difference Power and Discrimination course on Disability studies to the larger OSU community.
• We will work with the Office of Equity and Inclusion to hold exit interviews with all faculty and staff that leave the College to assess the inclusivity of our College climate and culture.
• A presentation will be delivered at each School’s off-site retreat each year on topics such as Best practices for teaching in a diverse classroom, Understanding biases and challenges faced by marginalized groups, etc. We will work with appropriate campus offices to deliver these presentations.

Positions planned for recruitment and description of the redirected faculty

To implement these student success Action Plans, we borrow from the CPHHS successful proposal approach to both 1) redirect current faculty efforts toward promoting excellence in learning experiences and outcomes; and 2) hire new faculty who will be directly involved in student success and the advancement of diversity. Collectively, these individuals will work together to initiate cross-college and across-university collaborations, provide leadership and high impact practices that ensure access and inclusion for underrepresented students; support intentional curricular design to integrate high-impact practices into student learning and to infuse diversity throughout the curriculum; and increase participation in study abroad opportunities as well as opportunities for multicultural awareness.

Action Plans. We propose four Action Plans that will be implemented by the College to increase student success while bringing issues of equity to the forefront of student learning and engagement. These include positions to Increase Diversity of Students in Engineering; increase Diversity of Students in Engineering and Sciences; Internationalize the Student Body; and Grow a Global Perspective (see Table 2 below).

Table 2. Summary of Proposed Action Plans

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<th>Action Plans</th>
<th>Redirected Faculty</th>
<th>New Faculty Hire</th>
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<tr>
<td>Increase diversity of students in engineering</td>
<td>Tenured Professor, Kendra Sharp, will have a portion of her work redirected to support the humanitarian engineering, science and technology program development. Sharp will assume a leadership role in the program which is already showing that it attracts a different demographic to engineering (more female, more individuals who want to ‘do good’ in the world). Sharp</td>
<td>The new faculty hire will be an Assistant Professor with specialty in renewable energy and thermal fluid sciences. The faculty member will be expected to teach undergraduate and graduate courses, conduct research related to renewable energy and engage in relevant internal and external service. This faculty member will be able to pick up courses that Professor Sharp is released from and will modify curricula to align</td>
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<tr>
<td><strong>Increase diversity of students in engineering and sciences</strong></td>
<td><strong>Tenured Associate Professor, Michelle Bothwell,</strong> will move from 0.50 to 1.0 FTE, with the preponderance of her new appointment directed toward leadership, research, and implementation of methods for inclusive engineering education and practice. Her work will promote establishment of an equitable and just workplace for women and others from traditionally underrepresented groups; ensure that faculty develop a working understanding of relational power within COE and other units at OSU; facilitate the establishment of authentic alliances across difference; promote educational experiences to narrow achievement gaps and advance success of all students; and promote COE engagement in the transformation of institutional culture.</td>
<td>The new faculty hire will be an Assistant Professor with specialty in biosensors and interfacial/materials science. The faculty member will be expected to teach undergraduate and graduate courses, conduct research related to next generation materials for medical diagnostics and high throughput microfluidic-based therapies – especially those that are disposable or otherwise applicable in low-resource settings – and engage in relevant internal and external service. The faculty member will play a critical role in supporting student recruitment, perseverance and success in bioengineering and materials science, which for women and underrepresented groups is demonstrably and strongly correlated to their possession of altruistic interests in line with their studies, and to a personal connection with caring mentors and teachers.</td>
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<td><strong>Internationalize the student body</strong></td>
<td><strong>Tenured Associate Professor, David Porter,</strong> will have a portion of his work redirected to support outreach to Latino students in Central and South America. Porter will be the chief point of contact in making connections with Latino universities for student exchange programs and graduate student recruiting.</td>
<td>The new faculty hire will be an Assistant Professor with specialty in human-centered engineering. The faculty member will be expected to teach undergraduate and graduate courses, conduct research related to human-centered engineering and engage in relevant internal and external service. This faculty member will modify curricula to include hands-on projects that are geared...</td>
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toward improving society, particularly nations with emerging economies.

| Grow a global perspective | Tenured Associate Professor, Burkan Isgor, will have a portion of his workload redirected to further develop the college relationship with Turkey; a priority engagement for OSU. The first three OSU COE engineering undergraduates just completed a six-week study abroad at Turkish universities. We expect additional Turkish students in Corvallis this year. As noted below, two faculty of Turkish descent will begin their tenure-track careers in COE; one in robotics and the other in advanced manufacturing. We believe these recent hires together with the collaborative research opportunities across a range of topics and the student exchanges will allow a robust relationship to develop with Turkey. | The new faculty hire will be an Assistant Professor with specialty in marine geomatics/geospatial engineering. The faculty member will be expected to teach undergraduate and graduate courses, conduct research related to marine geospatial engineering including gravity measurements and modeling, spatial reference systems, and advanced seismic monitoring networks, as well as engage in relevant internal and external service. The faculty will develop courses that emphasize interdisciplinary, global collaboration among diverse cultural players. Specifically, the faculty member will be able to interface with and contribute to the growing Civil Engineering Geomatics and CEOAS Geography programs. |

Additionally, we summarize faculty hires that occurred in 2014 in anticipation of the Provost’s Hiring Initiative and their impact on increasing the diversity of the engineering faculty and student body. These include positions to Increase Number of Female Faculty; Attract a Diverse Student Body (two positions); and Internationalize Student Body and Industry Relationships (see Table 3 below).

Table 3. Summary of Completed Hires (starting Fall 2014, initial year of funding supported by College/School efforts)

<table>
<thead>
<tr>
<th>Action</th>
<th>New Faculty</th>
<th>Relationship to Diversity Initiative</th>
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<tbody>
<tr>
<td>Increase number of female faculty</td>
<td>Tenured Associate Professor, Cindy Grimm (white female), has expertise in engineering computation and visualization and works with our robotics</td>
<td>Dr. Grimm’s computation and visualization expertise extends to bridging the gap between the arts and engineering. She has</td>
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<tr>
<td>Attract a diverse student body</td>
<td><strong>Assistant Professor, Yiğit Mengüç</strong> (white male, of Turkish descent), has expertise in robotics. He spent the last year as a post-doctoral researcher at Harvard.</td>
<td>Dr. Mengüç specializes in soft robotics – the design of robots and assistive devices that mimic biological phenomena and are ‘soft’ enough for contact with and wear by persons with or without disabilities. With application area to medical and rehabilitation devices, his classes and research are expected to attract a more diverse (gender and ethnicity) set of students into engineering.</td>
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<tr>
<td>Attract a diverse student body</td>
<td><strong>Assistant Professor, Brian Fronk</strong> (white male), has expertise in thermal fluid sciences.</td>
<td>Dr. Fronk’s expertise manifests itself in the study of renewable energy technologies that will impact the use of our natural resources. The renewable energy field has shown to attract a more diverse set of students interested in engineering for the good of society.</td>
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<tr>
<td>Internationalize student body and industry relationships</td>
<td><strong>Assistant Professor, Burak Sencer</strong> (white male, Turkish), has expertise in advanced manufacturing. He was previously a post-doctoral researcher at Nagoya University in Japan.</td>
<td>Dr. Sencer specializes in advanced machining techniques that reduce cutting forces on tough materials such as titanium. His connections with industry and universities in Japan will be leveraged to internationalize our student body and improve relationships with Oregon metals manufacturers.</td>
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**Resources to support the Action Plans and the success of new hires.** The College of Engineering currently invests significant resources to provide a menu of high-impact practices in our curricular and co-curricular activities that will support the Action Plans and the new hires.

- COE offers funding program for undergraduate research by students from underrepresented groups (e.g., LSAMP, one-off industry connections).
- The College has invested in a Living and Learning Community (LLC) in Fall 2014.
- Each discipline in the College offers a Writing Intensive Course program.
- Industry internships such as MECOP and industry graduate fellowships are integral to the majors in the College of Engineering and approximately 50% of our undergraduates participate in at least one internship experience during their studies.
- The College has a full-time International Program Advisor who oversees and facilitates the activities associated with the study abroad and incoming international students.
- The College has invested in four first year academic advisors and coordinates all first year advising activities across the College’s disciplines.
- The disciplinary units in the College all have introductory courses designed to assist each student in making the right choice of major and will accept another program’s course for credit. Additionally, an introductory course for undecided engineering students is taught by the College to assist in an informed student decision.
- The College has a Women and Minorities in Engineering Program and a Student Success Program for students from underrepresented groups.

The College will also provide specific resources to support the success of the new hires including:

- Required DPD training to enhance their ability to assist in reaching our goals;
- Assign a senior faculty member to serve as a mentor to enhance the professional advancement and assist new tenure-track faculty in becoming more familiar with the expectations of promotion and tenure;
- Summer salary equivalent to 2 months for two years during the first two years of appointment to allow time to develop new courses, network with community partners, and successfully implement the research program at OSU;
- Start-up funds to cover equipment, travel, computers, software, and other teaching and research-related expenses;
- Two Graduate Research Assistants (GRA) at .49 FTE for two years to assist with their research program;
- Ensure adequate infrastructure and pre-award support for faculty members seeking external funding;
- A standardized annual review process based on pre-negotiated expectations, annual reviews, faculty mentoring, and a comprehensive 3-year review to encourage any needed redirection. Our new faculty hires will participate in this review process.
II. Hiring Process Details

Attracting a rich and deep pool of candidates requires our recruitment strategies to evolve from previous searches. The strategies involve targeting recent graduates of Historically Black College and Universities (HBCUs) and the Hispanic Serving Institutions (HSIs) that have doctoral programs in engineering. Additionally, appeals will be made to the professional organizations of the Society of Women Engineering, National Society of Black Engineers and the Society of Hispanic Professional Engineers that further identify with underrepresented groups at all universities and professions. Search Committee members and faculty will intentionally reach out to faculty in these Colleges and Universities for help in disseminating the position descriptions and identifying potential applicants from their graduating students. Search Committee members will then personally contact these potential applicants.

The Search Committee Chair will complete the Search Advocate Training and the College will arrange for a special Search Advocate Training for faculty in the COE. All faculty will be encouraged to attend the training. The four redirected faculty members as well as other relevant faculty will serve on the search committees as well as an independent Search Advocate from outside of the College. To better assess candidates’ expertise/potential/interest in engaging students in experiential learning in and out of the classroom, mentoring undergraduate and graduate students, and delivering high-quality teaching, we will ask all candidates during the interview process to not only give a research seminar but also prepare for and teach a class relevant to their discipline.

III. Assessment Plan

Our assessment plan for monitoring the success of the Action Plans from this proposal contains primary and secondary measurements. The primary measures directly assess the impact of the Action Plans detailed in this proposal. The secondary measurements are indirect in nature and provide a global assessment of student success. Collectively these measures provide a comprehensive mechanism for monitoring the overall progress being made by the College of Engineering to advance student success through the lens of equity, inclusion and diversity.
### Table 4. Primary and Secondary Success Metrics

<table>
<thead>
<tr>
<th><strong>Primary</strong></th>
<th><strong>Baseline</strong></th>
<th><strong>3 yr</strong></th>
<th><strong>5 yr</strong></th>
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<tbody>
<tr>
<td>Gap between OSU and national averages for female students in engineering.*</td>
<td>Established with Fall 2014 data</td>
<td>Decrease gap by 50%</td>
<td>Eliminate gap</td>
</tr>
<tr>
<td>Gap between OSU and national averages for Native Peoples, Asians, Black and Hispanic students in engineering.*</td>
<td>Established with Fall 2014 data</td>
<td>Decrease gap by 50%</td>
<td>Eliminate gap</td>
</tr>
<tr>
<td>Percent increase of undergraduate and graduate students who participate in at least one global perspective practice prior to graduation.</td>
<td>Established in 2014-15</td>
<td>+ 2%</td>
<td>+ 5%</td>
</tr>
<tr>
<td>Number of students (undergraduate and graduate) who participate in community-based research under the mentorship of a COE faculty member.</td>
<td>Established in 2014-15</td>
<td>+ 2%</td>
<td>+ 5%</td>
</tr>
<tr>
<td>Number of students who participate in an international study abroad program (either incoming or outgoing).</td>
<td>Established in 2014-15</td>
<td>+ 3%</td>
<td>+ 10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Secondary</strong></th>
<th><strong>Baseline</strong></th>
<th><strong>3 yr</strong></th>
<th><strong>5 yr</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap in the first year retention rate between underrepresented ethnic groups and White students.**</td>
<td>White 87% Nat. Peo. 75% Asian 86% Black 80% Hispanic 78%</td>
<td>Decrease gap by 50%</td>
<td>Eliminate gap</td>
</tr>
<tr>
<td>Gap in the 6 year graduation rate between underrepresented ethnic groups and White students.**</td>
<td>White 63% Nat. Peo. 38% Asian 67% Black 20% Hispanic 56%</td>
<td>Decrease gap by 25%</td>
<td>Decrease gap by 50%</td>
</tr>
<tr>
<td>Percentage of COE faculty who have participated in DPD training during the previous year.</td>
<td>Established in 2014-15</td>
<td>+ 2%</td>
<td>+ 5%</td>
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<tr>
<td>Percentage of International Scholars and Faculty in COE.</td>
<td>Established in 2014-15</td>
<td>+ 2%</td>
<td>+ 5%</td>
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* Data to be taken from ASEE annual report “ASEE Profiles of Engineering and Engineering Technology Colleges.”

** IR data report for COE: 2012 cohort for retention and 2007 cohort for graduation rate.

Multiple parties collaborate to ensure the tracking and maintenance of satisfactory progress toward our College’s progress in increasing and equalizing student success. The COE central staff will work with Heads where the faculty are placed to collect assessment data for evaluation of the Action Plans. Institutional Research will also be utilized to collect information on the retention and graduation rates of the appropriate cohorts.