Project Description and Scope
Training to Bridge the STEM Professional Innovation Gap (BRIDGE) addresses Goal 1 of the OSU Strategic Plan—provide a transformative educational experience for all learners—by producing graduates proficient in the combination of technical, professional, leadership, and innovation skills required for a successful 21st century STEM worker. BRIDGE couples skills development with industry experience through an industry internship prior to graduation. BRIDGE graduates, so-called T-shaped professionals, possess a blend of interdisciplinary technical aptitude, well-honed leadership and professional skills, and business acumen. For Oregon companies, they are a new, valuable, and agile talent ready to contribute to core operations and growth across the critical occupations cited in the Oregon Talent Plan.

During the grant period, we will implement the BRIDGE platform with undergraduate and graduate students in the College of Science. Requested funds will cover conversion of first-term course content for delivery via OSU Professional and Continuing Education (PACE). We will simultaneously develop actionable plans to expand the BRIDGE Achievement Platform to a) other Colleges within OSU with an initial emphasis on linking with the College of Engineering’s Leadership Academy and with the College of Public Health, b) other Oregon institutions of higher education, and c) incumbent workers through developing options for BRIDGE platform implementation on company sites and for individuals through PACE Continuing Education at OSU.

The BRIDGE Achievement platform spans the gap between traditional scientific education and industry-desired agile T-shaped talent with a new, single year-long integrated platform. BRIDGE uniquely interweaves two known, proven, and successful experiential applied skill development platforms: Lens of the Market® (LoM) - a business/innovation/leadership program and an expanded version of the UO Graduate Internship Program (GIP), which provides professional/leadership skill development culminating in an industrial internship. The BRIDGE hybrid delivery model encompasses both face-to-face and online instruction. The online component will enable scaling to all OSU students, incumbent workers, other institutions, and to companies. Students will initially receive credit for their work through Professional and Continuing Education (PACE) at OSU. The BRIDGE achievement capstone is an internship at an Oregon company where the student can immediately be a productive contributor. BRIDGE fills a gap at OSU, as science and engineering faculty have for years been sending graduates to the UO GIP, so graduates can acquire the skills necessary for employment.

The OSU College of Science (COS) will be the starting point for BRIDGE. The College of Public Health and Human Sciences is first on our scale-up agenda. The College of Engineering is also interested to partner on offerings and coordination with partners to the betterment of both its existing Leadership Academy and the proposed BRIDGE program. Letters of support from these colleges demonstrate their interest. The Oregon Talent Plan (OTP) describes that Oregon companies cannot grow or be competitive without the right talent and that workers need the right combination of skills to be productive and competitive in today’s workplace. Key OTP findings indicate graduating students possess applied-skills
and work-experience gaps that hinder translating educational credentials into successful employee performance. The BRIDGE Achievement Platform addresses these critical OTP gaps.

BRIDGE provides a formative experiential learning skills development platform in both business/analytics and leadership/professional integrated with technical STEM training that culminates in an industrial internship Capstone. BRIDGE front loads applied skills (critical thinking, project management, business acumen and other skills) required in an industrial setting to maximize the internship experience. Participants co-create outcomes based on guidance and templates from instructors – a mode of learning preferred by Millennials and Gen Z. BRIDGE fosters and requires engagement of skilled instructors with track records of technical and commercial success. All instructors have deep scientific and industrial credentials across a wide array of industry sectors aligned with the OTP.

Robust Industry Engagement – A strong level of collaboration, commitment and investment by industry. The BRIDGE experiential skills development platform is guided by industry needs. The Industry Advisory Board (IAB), comprised of industry professionals from each of the 5 key industry sectors – Advanced Manufacturing, Bioscience, Energy Technologies and Utilities, Healthcare, Information Technology – review programming, provide assessment and review outcomes. Industry is the key partner in providing internships as the capstone to BRIDGE and for providing Lens of the Market instructors.

Cost-effectiveness and Agility – The ability to demonstrate scalability and return on investment. BRIDGE is built as a revenue generating and scalable model, eliminating competition for resources that currently support academic training. This grant is required to kick-start the program and act as the critical catalyst to build initial online components. Revenue streams for sustainability post grant include (a) internships, (b) module usage fees from partner institutions, (c) PACE course credits, and (d) direct company payments for tailored on-site delivery of the BRIDGE Achievement Platform.

Expanded Reach and Diversity – The ability to serve diverse populations and multiple regions of the State. The BRIDGE Achievement platform is designed to be deployed both through existing OR institutions of higher education across the State as well as through onsite company programs. As such, it can reach a very diverse population and help better prepare students transferring to OSU. In addition, the internship model will inherently connect students with businesses throughout the State to maximize the impact of the program.

**Project Implementation Plan**

**BRIDGE OVERVIEW, PARTNERSHIPS, UNIQUE and INNOVATIVE PLATFORM**

The BRIDGE Achievement platform innovatively and efficiently spans the gap between traditional scientific education and industry-desired agile T-shaped talent with an adaptable and innovative year-long integrated, modular, and experiential curricular platform. The platform uniquely interweaves two known, proven, and successful experiential applied skill development programs: 1) internship facilitation and professional/leadership skill development, in alignment with practices at the University of Oregon Graduate Internship Program (GIP) and 2) business acumen/innovation/leadership skill development, Lens of the Market ®. BRIDGE graduates – undergraduates and graduate students - are so-called T-shaped professionals. They are valuable and agile emerging workers possessing a blend of interdisciplinary technical aptitude, well-honed leadership and professional skills, business acumen, and experience to provide Oregon industry the talent required for growth.

BRIDGE engages industry partners through multiple mechanisms – as providers of internships, as members of the Industry Advisory Board (IAB) providing ongoing guidance, as program evaluators, as Lens of the Market trainers, and as team and individual student mentors. As a key customer of both the emerging talent developed via BRIDGE and the onsite Company deployment of a tailored and customized BRIDGE platform, industry continuously provides input.

BRIDGE engages higher educational institution partners beyond OSU through multiple mechanisms – as UO co-Lead and partner, as External Integration Council (EIC) members to provide insights on requirements for alignment with community colleges and other higher ed institutions, as beta testers of the Continuing Education PACE platform which BRIDGE will deploy as a means of scale-up, as identifiers of industry professionals to be Lens of the Market Trainers and mentors aligned with their institutions.

**BRIDGE will result in the following stakeholder aligned deliverables:**
• **For emerging and incumbent Oregon workers:** Deliver a measurably effective combination of technical educational credentials, business/innovation/leadership/professional applied skills and industry experience to develop agile and career resilient 21st STEM workers.

• **For Oregon and Oregon Institutions of Higher Education:** Deliver a mechanism to reach across OSU Colleges and to create onsite programs in other Oregon institutions of higher education.

• **For Oregon employers, overall, and explicitly the five (5) key industry sectors in the Talent Plan:** Deliver a mechanism to BRIDGE Oregon talent gaps for emerging and incumbent employees.

**BRIDGE KEY PROJECT WORK, RESULTS, TIMELINES, MILESTONES: Overall and During the Grant**

The BRIDGE Achievement Platform builds T-shaped professionals by integrating cross-cutting, professional, business, and leadership skills and experiences with just-in-time training and the student’s academically chosen STEM discipline. The yearlong BRIDGE platform culminates in a 3- or 6-month industrial internship. Specifically, BRIDGE will consist of 20 modules, what we define as discrete experiential and applied skill topics of differing duration delivered in groupings each academic quarter over 1 academic year (4 quarters). Table A describes all modules to be ultimately developed aligned by the type of applied/cross-cutting skill they will develop. BRIDGE uniquely and innovatively interweaves modules together into a single curricular platform that uses both face-to-face and online delivery through OSU PACE. PACE supports availability throughout the state to companies and to other institutions that will augment modules with local expertise. Delivery of the modules will use a combination of distance learning (online) formats and intensive in-person workshops. All of the modules have been used previously and tested in various formats but not comprehensively in an online format. Each BRIDGE module will have all or many components online to facilitate broader use. Format selection will be based on the module, best practices for presenting the material, and the necessity for group work, discussions, and exercises. We will work closely with Career Services to offer augmented professional development and internship opportunities that build on trusted and direct industrial and employer relationships. Online professional development modules and associated face-to-face interactions will be available to aid retention.

**Agile career development modules (5)** enable students to engage and successfully compete for employment opportunities; develop resilient and agile behavior and provide the skills to adapt in a professional environment regardless of employment type or industry.

**Intrapersonal skills development modules (6)** focus on self-awareness and introspection to enable students to more effectively and self-knowledgeably engage in their work and communicate data and concepts from a deepened understanding of their situational behavior, motivations, goals, and how they receive, diagnose, process, and communicate information.

**Interpersonal skills development modules (6)** build ability and agility with the frameworks, skills, and approaches to facilitate successful outcomes when working and communicating with others either individually or in cross-functional teams. The content focuses on building trust, clarity, buy-in and understanding in diverse groups, environments and circumstances to resolve conflict, understand and be sensitive to implicit bias, and facilitate open communication to support agility and talent build.

**Market and Business analysis modules (3)** build business acumen and market analysis/analytic skills to align experiences and research with market requirements and develop and validate the value add of a value proposition based on business requirements. Work is conducted in cross-functional, interdisciplinary teams to provide direct industry-like environments. The research and work that is analyzed for market potential is selected by the team based on research and experiences of at least one team member, thereby making all analyses directly applicable, relevant, and actionable. Results can be used to direct efforts and reinforce worker flexibility, agility, diagnostic thinking, and project planning and management. Industry mentors provide teams with ongoing feedback and assistance with market data acquisition from both primary and secondary sources. **Market and Business Analysis Experiential reinforced PD skills** provide an experiential context and just-in-time implementation for the professional development modules as part of the Lens of the Market business/commercial training thereby reinforcing cross-cutting skill acquisition. Additional training in project and time management, market interviewing skills, and data analytics as the basis for critical decision making round out business analysis skill development.
Table A: Summary of BRIDGE applied skills development modules. Legend: *experiential reinforcement of PD skills during Lens of the Market STEM aligned business and innovation training

<table>
<thead>
<tr>
<th>Professional Development (PD) /Leadership Applied Skills</th>
<th>Business Acumen/ Commercial/Innovation Applied Skills Modules (delivered through Lens of the Market®)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Modules</td>
<td>Business Acumen/ Commercial/Innovation Applied Skills Modules (delivered through Lens of the Market®)</td>
</tr>
<tr>
<td>Intrapersonal Modules</td>
<td>Reinforced PD/Leadership Skills</td>
</tr>
<tr>
<td>Interpersonal Modules</td>
<td></td>
</tr>
<tr>
<td>1. Assessing – Skills, Strengths, Careers</td>
<td>18. Linking research, innovation and market: Value propositions and Differentiators; Value Chains; Technology Platforms</td>
</tr>
<tr>
<td>2. Resume &amp; Cover Letter</td>
<td>19. Market analysis and Diagnostic thinking: Qualitative and quantitative summative and formative data strategy analysis*</td>
</tr>
<tr>
<td>4. Networking and Job Searching</td>
<td>*(17) Communication-speaking, listening, body language; (16) Visual Data Communication aligned with presentations; (12) teamwork</td>
</tr>
<tr>
<td>5. Online Presence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Emotional Intelligence &amp; Conflict Resolution</td>
</tr>
<tr>
<td></td>
<td>7. Confidence &amp; Stress Mgmt.</td>
</tr>
<tr>
<td></td>
<td>8. Implicit Bias</td>
</tr>
<tr>
<td></td>
<td>9. Personality Profiles</td>
</tr>
<tr>
<td></td>
<td>10. Adaptability &amp; Resilience</td>
</tr>
<tr>
<td></td>
<td>11. Project and time management</td>
</tr>
<tr>
<td></td>
<td>12. Teamwork</td>
</tr>
<tr>
<td></td>
<td>13. Etiquette</td>
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<tr>
<td></td>
<td>14. Creating Rapport</td>
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<tr>
<td></td>
<td>15. Influence</td>
</tr>
<tr>
<td></td>
<td>16. Visual Data Communication</td>
</tr>
<tr>
<td></td>
<td>17. Communication-speaking, listening, body language</td>
</tr>
</tbody>
</table>

BRIDGE Platform mechanics: Overall

**BRIDGE** is designed to be an academic year in length -- 4 quarters -- of training plus internship. (See Table B) As such the modules are taken in conjunction with and in reinforcement of the STEM academic disciplinary program in which the student is currently matriculated in order to reinforce T-shaped, integrated skills. **BRIDGE** modules are taken prior to and during the internship. Modules are grouped to maximize student just-in-time skill build and ability to apply the learnings in reinforcing experiences such as the internship and during the Lens of the Market® market/innovation analysis. To participate, all students must have the support of their academic advisors.

The total **BRIDGE** cycle is four (4) quarters – from recruitment to completion, unless the student wishes a six month or 2 quarter internship. In this case, the program can take 5 quarters to complete. Each **BRIDGE** cohort consists of up to 50 students recruited, screened, interviewed, selected and notified of acceptance into the program during the Spring and Summer quarters preceding the start of the start of the curriculum. The cohort will begin the **BRIDGE** professional/business applied skill development program in the Fall quarter. They will engage in the experiential modules in the Fall, Winter and Spring quarters to acquire the applied skills for the internship in the Summer quarter, during which time they will continue participating in modules selected to reinforce and improve skills aligned with the internship. **BRIDGE** modules and timing is designed to prepare students to maximize their experience during their internship by front-loading much of the applied skills (critical thinking, project management, business acumen and other skills) required in an industrial setting. Each module, in each quarter will have assignments, which must be completed either individually or as a team, and presentations to view (videos), attend or make both through PACE and with instructors. Each participant will be expected to meet briefly with an advisor weekly. Modules are not for grades. Modules are pass/fail. “Fail” in two modules/quarter can result in a participant being asked to leave the program. Table B shows the modules aligned by academic quarter. Each academic quarter has a theme, and themes and their associated modules build on learnings from previous quarters.
### BRIDGE MANAGEMENT PLAN

The BRIDGE Management Team will be co-chaired by Grant PI, Dr. Douglas Keszler, Distinguished Professor, serial entrepreneur, and Associate Dean for Research of the College of Science and Dr. Rich G. Carter, Professor and Chair of the Chemistry Department at OSU and successful entrepreneur/venture founder. Upon completion of the hire in April, the College of Science Director of Partnerships and Industry Programs (DPIP) will replace Dr. Carter as co-chair. Team members will be other grant key personnel/advisor: Dr. Judith Giordan, OSU Professor of Practice, VP and Managing Director of ecosVC, Inc. and Mr. Chris Larson, Senior Director, University of Oregon Graduate Internship Program.

The BRIDGE Industrial Advisory Board (IAB) enables strategic collaborations between industry and ongoing input of industrial requirements for T-shaped professionals in changing environments. Chaired by MT member Giordan, IAB members will include a representative from each of the five (5) key industrial sectors of the Oregon economy (Advanced Manufacturing, Bioscience, Energy Technologies and Utilities, Healthcare, Information Technology) and MT co-chairs Keszler and Carter. The IAB will meet at least twice yearly. The IAB will participate in all evaluation and assessment (Tables C-F).

The BRIDGE External Integration Council (EIC) enables adoption of BRIDGE by other Colleges within OSU and by other institutions of higher education in OR, and it provides ongoing input requirements for successful adoption and scale. Chaired by MT co-chair Carter, members are representatives from the OSU Colleges of Engineering and Public Health and external members from community colleges and universities across the state. Letters of Commitment from OSU colleges, OR Community Colleges and universities are provided. The EIC will meet at least twice yearly. The EIC will participate in all evaluation and assessment (Tables C-F).

### BRIDGE FLEXIBLE, SCALABLE and COST-EFFECTIVE DELIVERY SYSTEMS

As described above, module delivery will use a combination of online formats and intensive in-person workshops. All the modules have been previously deployed and tested using in-person, hybrid in-person plus distance learning flipped classroom formats, or both. Each module will have components online to facilitate broader use. Format selection will be based on the module, best practices for presenting the material, and the necessity for group work, discussions, and exercises.

### BRIDGE UTILIZATION and SHARING of RESOURCES DURING and POST GRANT

As described above, the BRIDGE Achievement Platform is intended to be adopted and scaled by others using the PACE modules. The entire platform may be adapted or selected modules may be selected to create a tailored program. We aim to satisfy the needs of all 75,000 STEM majors at all higher-ed institutions and community colleges across the state.
Industry Engagement

Industry interaction and engagement is critical for both the success of the BRIDGE platform and the career success of the emerging and incumbent workers trained through the platform. Industry is engaged in three (3) key ways:

1. As members of the Industry Advisory Board (IAB). Our intent is to have at least one representative from each of the five key industrial sectors cited in the Oregon Talent Plan including a range of representation from large, medium, small and start-up companies. Founding members of the BRIDGE Industry Advisory Board include:
   - Grant Yoshihara, Vice President, NW Natural
   - Skip Rung, Executive Director, Oregon Nanoscience and Microtechnologies Institute
   - Andrew Grenville, CEO, Inpria Corporation
   - Curtis Burton, R&D Director, Willamette Valley Company
   - Doug Morris, CEO, Polaris Battery
   During the first three months following an award, we will work with the founding Board to identify four additional members. We already have approximately 500 personal and professional contacts in Oregon companies representing manufacturing, chemicals, and materials. The Director of Partnerships and Industrial Programs (DPIP) will work with the Board Chair, Judith Giordan, and Board members to expand representation in data science, biosciences, and health.

2. To provide guidance on curriculum and evaluation and assessment of outcomes. The Board will provide guidance on module and course development and assessment metrics. The Board members will participate in evaluation and assessment of BRIDGE per the Metrics and Evaluation Process described in Section 3.4.8 below, and aid in identifying other companies to provide representatives to increase the robustness of the assessment data.

3. As providers of internships. The DPIP will work continuously with companies to identify both student internships and company on-site BRIDGE training opportunities to impact as broad a range of incumbent workers as is possible. The Board will assist the DPIP to expand the BRIDGE company network. Companies will financially co-invest in BRIDGE through internship salaries and payments for on-site training.

Reach and Diversity.

BRIDGE reach is designed to achieve interaction with each diverse population and will seek to engage a wide range of representatives from each constituency. BRIDGE reach is designed to engage with companies, organizations, and institutions of higher learning across Oregon to ensure broad implementation of the platform which provides all three aspects of talent development - STEM educational credentials, applied skills, and work experience. The agile talent developed through BRIDGE includes both students and incumbent workers, and the platform is designed to be shared broadly with institutions and companies outside of Oregon State University in ways that they can adapt the platform to fit their local student and constituency needs. As such BRIDGE reach addresses all of the populations defined above primarily but not solely through members of both the External Integration Council (EIC) and the Industrial Advisory Board (IAB). Therefore, it is vital that we have secured a board range of committed and invested partners in each group.

The External Integration Council is chaired by BRIDGE management team member Carter and is comprised of members both from Colleges within OSU, outside of the College of Science, and institutions across the State external to OSU - Community Colleges (CCs) and Universities (See Implementation Section Management Plan). Letters of commitment from each institution recognizes the intent of the CC or university to be an investing partner in our 2016 Oregon Talent Council application entitled "Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE)." The commitment includes investment of service on the External Integration Council (EIC) as a means to provide input on the curriculum, to develop a broad cross-institutional deployment plan, and to ensure that expansion and reach of BRIDGE to the institution and access to diverse populations occurs post-grant. It should be noted that we estimate the potential reach near 75,000 STEM students.
We have received letters of commitment from (* denoted EIC board member):

- Eastern Oregon University (Anna Cavinato)*
- Southern Oregon University (Laura Hughes)
- Oregon State University – Cascades Campus (Jeff Gautschi)*
- Portland Community College (Nancy Pitzer)
- Southwestern Oregon Community College (Mike Springer)
- Oregon Coast Community College (Cindy Carson)*
- Blue Mountain Community College (Alex Murphy)

The **Industrial Advisory Board** is Chair ed by BRIDGE management team member Giordan and will ultimately be comprised of representatives of companies – large, small and start-ups – across the range of the five (5) key industrial sectors cited in the Oregon Talent Plan. (See Implementation Section Management Plan) Letters of commitment from each company recognize the intent to be an **investing partner** providing input, guidance, and insights into the development and deployment of the BRIDGE platform, provide assessment of the skills sets being obtained by the participants, provide internships, and guide the development of on-site company options for BRIDGE to broadening reach to incumbent workers across all educational levels and job roles.

In addition to founding members of the IAB, we have received letters of commitment from

- Hewlett Packard
- On Semiconductor
- Valliscor
- Pacific Light Technologies
- Qorvo

**Sustainability**

Program sustainability is based on four (4) components: 1) scale up on the OSU campus of training in professional development and business/innovation skills (Tables A and B) 2) internships aligned with the yearlong platform; 3) adoption of either the entire BRIDGE yearlong platform or select modules at 4-year and community colleges across the State, including the online PACE platform and learning combined with trained on-site facilitators; and 4) BRIDGE delivery onsite at companies located across the State, addressing key industrial sectors. **The program generates new revenue and will not impact commitments to funding academic programs.**

1. **Scale up of BRIDGE at OSU:** Over five (5) years we plan to build out all modules (Table A) of the BRIDGE program with the aim of providing the platform to at least 400 students each year on the OSU campus. For the full internship program, students will range from junior and senior undergraduates to Ph.D. graduate students. In addition, we will provide specific modules from both professional development and STEM aligned business/innovation training to reach back to freshmen and sophomore undergraduates. To support the program, we will recover tuition payments for on-campus enrollment in the BRIDGE professional development and business/innovation modules. By emphasizing economies of scale, we should be able to offer professional development modules for as little as $20 each, while also reducing student debt loads of participating students.

2. **Internships:** Our financial plan mirrors that of the UO Graduate Internship Program (GIP). By serving 80 master’s students each year, the GIP recovers through industry-sponsored internships and associated tuition payments approximately $1.4M/yr. For those students securing internships at $4,000 to $5,000/month, we will be able to recover partial tuition payments through continuous enrollment. At UO, these funds sustain six support staff to administer the GIP and recruit students; $400,000 is returned each year to support academic programs. The successful student outcomes
(>90% internship placement) and GIP financial model help to validate the implementation of the BRIDGE platform at OSU.

3. BRIDGE expansion to community colleges and universities across the State.
Oregon State University's online education program ranks 5th in the Nation by U.S. News and World Report. Proposal Leads Keszler and Carter, as Chairs of the OSU Department of Chemistry, have guided the online undergraduate OSU Chemistry program to #1 in the Nation. We plan to take advantage of the marketing prowess of OSU online programs, the skills of the Professional and Continuing Education (PACE) arm of OSU online, and the input of our External Integration Committee to make the BRIDGE platform available to all universities and community colleges across Oregon. This experience will prepare us to pursue program adoption nationally. We are first movers in this STEM professional-education market, and we aim to place OSU at the forefront of creating T-shaped STEM professionals.

<table>
<thead>
<tr>
<th>Conservative 5-Year Revenue Projection</th>
<th>Year 1</th>
<th>Year 3</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BRIDGE Modules @ OSU</td>
<td>$5,000</td>
<td>$30,000</td>
<td>$50,000</td>
</tr>
<tr>
<td></td>
<td>(25)*</td>
<td>(200)</td>
<td>(400)</td>
</tr>
<tr>
<td>2. Internship tuition return</td>
<td>$138,000</td>
<td>$460,000</td>
<td>$860,000</td>
</tr>
<tr>
<td></td>
<td>(25)</td>
<td>(80)</td>
<td>(125)</td>
</tr>
<tr>
<td>3. BRIDGE Modules @ UO, 4-year colleges, &amp; community colleges</td>
<td>$6,000</td>
<td>$48,000</td>
<td>$90,000</td>
</tr>
<tr>
<td></td>
<td>(50)</td>
<td>(400)</td>
<td>(750)</td>
</tr>
<tr>
<td>4. BRIDGE on company sites</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

*number of students

The projection illustrates revenues based on the UO Graduation Internship Program financial model and initial growth curve of the College of Engineering Leadership Academy. The projection includes only base engagement levels. Item 2, for example, does not include revenue for students who participate in BRIDGE part time and secure an internship. The total addressable market in Oregon for Item 3 is 75,000 STEM students; we have assumed only a 1% participation rate. OSU PACE has already indicated an interest in marketing BRIDGE Modules nationally to a market of approximately 5,700,000 STEM students.

Expenditures for sustainability include $80,000 for the program coordinator, a license fee of $10K for each group of 50 participants in LoM, addition of 2 LoM trainers per year at $10K each. By year 5, we will hire at least 6 additional BRIDGE trainers, 1 program developer and marketer, and 1 recruiter, each at $80K/year. Conservative revenue estimates cover these costs. Our goal is to generate sufficient external revenue such that any OSU instructor can have free access for use in their OSU courses. We will build a program that is self-sufficient and does not compete with academic programs for funds.

Metrics and Evaluation Process
Within the context of BRIDGE we define evaluation as (1) a systematic process to improve the Achievement platform (formative evaluation) and (2) to determine whether BRIDGE achieved its stated goals for students and employers – talented and agile emerging workers with demonstrated proficiency in applied skills, work experience, and technical aptitude associated with a T-shaped professional (summative evaluation). Evaluation will be both formative and summative. (Tables C-F below for details)

Within the context of BRIDGE we define assessment as the measurement of 1) knowledge, skills, and abilities associated with emerging workers – students becoming T-shaped professionals from participating in BRIDGE, and 2) the efficacy of the platform’s investment leverage, capacity building, and programmatic impact and effectiveness. Assessment of platform efficacy will include assessment of 1) capacity build, 2) investment leverage, 3) program impact and effectiveness by emerging worker student participants, instructors, and industry partners. Assessments will be done by employers, industry advisory board members, instructors, and students.
**Formative evaluation** comprises empirical qualitative and/or quantitative data to improve the platform and training modules on an ongoing basis. As such, formative evaluation focuses on the functioning and delivery of the platform both within the grant context and as a source of empirical data to determine leverage, transfer and scale of the platform to other institutions, regions of the State, and incumbent employees post grant. We will use formative evaluations¹ (“customer” satisfaction surveys) of the curriculum for ongoing process improvement informed by empirical evidence. Student formative evaluation surveys, complemented by assessment surveys by students (peers), industry participants, external advisors, and instructors, will provide feedback on the efficacy of platform materials and training toward developing agile talent. **Summative evaluation** uses data to determine whether the BRIDGE Achievement platform achieves stated deliverables and outcomes. In this context, **summative evaluation** of BRIDGE requires both formative evaluation plus assessment of Capacity, Investment Leverage; and Program Impact and Effectiveness, including content efficacy by student participants, instructors, and employers. The Summative Evaluation works in conjunction with formative evaluations to demonstrate the effectiveness and impact of BRIDGE and to inform future efforts. (Figure 1)

We will build upon validated and existing evaluation and assessment instruments developed and used by Giordan in Lens of the Market with 500 participating students across the country over the course of multiple years and those from Larson of the University of Oregon Graduate Internship program with over 700 student interns. The survey instruments contain various satisfaction scales and open-ended questions on curriculum delivery (formative evaluation) as well as retrospective pre-post knowledge and ability (assessment) questions to determine qualitatively student learning and program quality.

We will track all students in all modules and components of the program, internships, and employment. Students who understand why and how career options overlap their strengths, skills, and passions make improved academic decisions. Consequently, students offered professional skill-building opportunities are more likely to persist to graduation. Because they are widely neglected in science education, professional and career development represent critical gaps among our efforts to improve academic success. From our data, we will determine the most effective professional development components promoting academic success. As the program fully supports the OSU Learning Goals for Graduates, assessment is aligned with the seven components. BRIDGE builds awareness and reinforces these goals in the context of experiences that make a difference.

**Budget Proposal**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Development of first-term BRIDGE online modules for delivery via PACE</td>
<td>$90,000</td>
</tr>
<tr>
<td>b. Salesforce software and programming</td>
<td>$10,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$100,000</strong></td>
</tr>
</tbody>
</table>

**Justification** – We have worked with Melanie Mitchell and John Buzzard at OSU PACE to ensure that first-term modules will be in place for the first BRIDGE cohort in fall 2016.

To support BRIDGE assessment and student tracking, we have worked with John Henry in the Graduate School on a schedule to implement Salesforce software in the College of Science by fall 2016. This investment will pay broader dividends by supporting success initiatives across the College.
### Tables C-F: BRIDGE Evaluation and Metrics: capacity, content, investment leverage, deliverables

<table>
<thead>
<tr>
<th>Agile Talent T-Shaped Professional Content</th>
<th>Evaluation Methodology/Timing/By whom</th>
<th>Assessment Methodology/Timing/By whom</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lens of the Market</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiential</td>
<td>Formative evaluations of BRIDGE platform content</td>
<td>Survey/Rubric (conducted annually with students; employers; external advisory members; instructors by BRIDGE leadership):</td>
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<tr>
<td>Commercial</td>
<td>(conducted prior to starting and at the end of the program and per course, at the end of each course by BRIDGE leadership)</td>
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<tr>
<td>Business experience</td>
<td>• Emerging Talent during grant; incumbent talent after scale up to this constituency post grant</td>
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<tr>
<td>Social</td>
<td>• Program demand; # interested; # by education level; # by STEM field; Preferred methods of recruitment</td>
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<td>Monumen innovation training</td>
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<td>Emerging Talent</td>
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<td>Incumbent Talent</td>
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| Leadership and Professional Skills        |                                      |                                      |
| Current development, Intra and Inter personal | Formative evaluations of BRIDGE platform content | Survey/Rubric (conducted annually with students; employers; external advisory members; instructors by BRIDGE leadership): |
|                                          | (conducted prior to starting and at the end of the program and per course, at the end of each course by BRIDGE leadership) |  |
|                                          | • Emerging Talent during grant; incumbent talent after scale up to this constituency post grant |  |
|                                          | • Efficacy platform for developing business and commercial savvy agile talent |  |
|                                          | • Efficacy platform for developing commercial and business skills |  |
|                                          | • Program adoption rate |  |
|                                          | • Program success at developing agile talent |  |

| Work experience & internships aligned with honed professional and business skills |                                      |                                      |
| Emerging Talent | Formative evaluations of Internship (conducted prior to starting and at the end of the program by BRIDGE leadership) | Survey/Rubric (conducted after internship with students; employers; external advisory members; instructors by BRIDGE leadership): |
| Incumbent Talent | • Emerging Talent during grant; incumbent talent after scale up to this constituency post grant |  |
|                  | • Efficacy platform providing industry employment experience |  |

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<th>Investment Leverage</th>
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<td>Industry Investment: People Resources Internships</td>
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<td>• # of people participating as assessors; committee members; mentors</td>
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<td></td>
<td>• # of internships provided (aim is 25 in year 1 and 50/year after that)</td>
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<td>OSU Investment Department College Institutional</td>
<td>Counting to measure efficacy of recruitment and amount of involvement (Survey/Interview conducted annually by BRIDGE leadership):</td>
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<tr>
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<td>Department</td>
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<td>Marketing</td>
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<td>Other Investments</td>
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<td></td>
<td>Committee members</td>
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<tr>
<th>BRIDGE IMPACT and EFFECTIVENESS by Deliverable</th>
<th>Evaluation Methodology/Timing/By whom</th>
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<tbody>
<tr>
<td>For emerging and incumbent Oregon workers:</td>
<td>Survey/Rubric (conducted annually at year end by Company and BRIDGE leadership):</td>
<td></td>
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<tr>
<td>Platform to develop emergent agile talent:</td>
<td>Satisfaction with and quality of interaction.</td>
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<tr>
<td>Actionable plan and process for making the BRIDGE Achievement platform available to incumbent Oregon workers</td>
<td>Perception of value added for the company.</td>
<td></td>
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<tr>
<td>Desire to continue to participate and increase involvement</td>
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<tr>
<th>For Oregon and Oregon Institutions of Higher Education</th>
<th>Evaluation Methodology/Timing/By whom</th>
<th>Assessment Methodology/Timing/By whom</th>
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<tbody>
<tr>
<td>A plan and process for BRIDGE: Scale-up at OSU to other Colleges:</td>
<td>Survey/Rubric: (Conducted annually at year end with each OSU entity by BRIDGE leadership):</td>
<td></td>
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<tr>
<td>Replication at other institutions of higher education: Community college and four-year institutions across Oregon.</td>
<td>Satisfaction with and quality of interaction.</td>
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<tr>
<td>Perception of value added for the OSU unit.</td>
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<tr>
<th>For Oregon employers, overall, and explicitly the five (5) key industry sectors in the Talent Plan:</th>
<th>Evaluation Methodology/Timing/By whom</th>
<th>Assessment Methodology/Timing/By whom</th>
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<tbody>
<tr>
<td>T-shaped STEM professionals who can grow Oregon business: Develop options for companies to deploy BRIDGE on their sites.</td>
<td>Survey/Rubric (conducted annually at year end with other investors by BRIDGE leadership):</td>
<td></td>
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<tr>
<td>Satisfaction with and quality of interaction.</td>
<td>Perception of value added for the OSU unit.</td>
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<tr>
<th>BRIDGE Evaluation and Metrics: capacity, content, investment leverage, deliverables</th>
<th>Evaluation Methodology/Timing/By whom</th>
<th>Assessment Methodology/Timing/By whom</th>
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<tbody>
<tr>
<td>Number of emerging workers (students) impacted (aim is 25 in year 1; 50/year years 2-5; scale as needed after)</td>
<td>Counting (conducted annually by BRIDGE leadership):</td>
<td></td>
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<tr>
<td>Program demand; # interested; # by education level; # by STEM field; Preferred methods of recruitment</td>
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| Plan for scale to other regions and institutions | Evaluation Methodology/Timing/By whom | Assessment Methodology/Timing/By whom |
| Done or not (per grant timeline by BRIDGE leadership) | Survey/Rubric: (Conducted annually post grant by institution to which BRIDGE was awarded): |
| Program adoption rate | Program success at developing agile talent |  |

| Plan for scale to incumbent workers | Evaluation Methodology/Timing/By whom | Assessment Methodology/Timing/By whom |
| Done or not (per grant timeline by BRIDGE Industry Outreach Group and Leadership) | Survey/Rubric: (Conducted annually post grant by OSU): |
| Program adoption rate as a function of worker type | Program adoption by COMPANIES |  |
| Program success at developing agile talent: |  |  |
March 2, 2016

Dear Oregon Talent Council:

I am writing this letter to support the proposal entitled *Bridge the STEM Professional Innovation Gap ("BRIDGE")*. As the current Vice President of Operations and Chief Engineer for NW Natural and an industry advisor to the Oregon State University College of Engineering Leadership Academy, I have professional and personal experience with the broader effort to produce more “T-Shaped Professionals” out of the engineering and science education sectors. The BRIDGE proposal will provide a valuable platform for developing future leaders of industry in multiple areas.

I, along with several colleagues from the broader business community, have personally been engaged in the development of the Engineering Leadership Academy Program at Oregon State. After a successful initial year of development and execution, it is creating awareness and building the skills of engineering and science students in communication, teamwork, and business skills that will greatly accelerate their ability to contribute to building value for companies once they enter the workforce.

The BRIDGE platform’s coupling of the Lens of the Market business innovation and leadership program and the Graduate Internship experience provides for effective business, technical and soft skills leadership development. Linking this together with a hybrid, face-to-face and online approach will also create greater accessibility and collaboration in an expanded network.

I strongly support this proposal to the Oregon Talent Council made jointly by Oregon State University and the University of Oregon, both of which I am fortunate to be a graduate of.

Sincerely,

Grant M. Yoshihara
Vice President, Utility Operations
NW Natural
Doug and Julie:

Attached is a pdf of a letter of support for your submission package. Let me know if the content is accurate and meets your needs. I would be happy to be involved in supporting this effort, either as a member of the Industrial Advisory Board or participating in the assessment and evaluation process.

Grant

Grant M. Yoshihara
Vice President, Utility Operations
NW Natural
220 NW Second Avenue
Portland, OR 97209
Ph. 503.220.2374
gmy@nwnatural.com
March 1, 2016

To: Oregon Talent Council

I am writing this letter to support the proposal entitled Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE). As former Director of Research and Development at the Hewlett Packard Corvallis facility, current President and Executive Director of Oregon Nanoscience and Microtechnologies Institute, an investment committee member at the Oregon Angel Fund, and Managing Member of the 2015 Willamette Angel Conference LLC (which uses Oregon student interns for due diligence), I have direct experience with employees from the corporate lab to startups, including graduate-student interns. I believe the BRIDGE program proposed by OSU is an excellent way for OTC to advance its objective to build T-Shaped Professionals for Oregon companies.

I have personally been engaged with both of the BRIDGE core components; professional development content currently delivered by the Graduate Internship Program at UO and Lens of the Market at OSU. I have seen the transformative effects on engineering and science students, enhancing their communication, teamwork, and business skills to the point that they can substantively contribute to building value for companies. From the ONAMI perspective, BRIDGE will prepare students to contribute to the Advantage Accelerator (as interns or client company personnel), which is among the feeders of fundable opportunities to our Commercialization GAP Funding Program; as well as directly to the success of our portfolio companies via our Graduate Internships in Startups (GIST) Program. Though this program we connect STEM student interns with startup companies who have successfully completed GAP projects. Being able to tap into the BRIDGE students will provide a significant competitive advantage for these companies, whose growth will depend on finding suitable local talent. At the same time, engagement activities in the Lens of the Market allow us to greatly expand the network of potential advisors, mentors, and investors in Oregon companies.

As a member of the Industry Advisory Board, I very much look forward to working with the BRIDGE program to build opportunities for emerging workers across all OTC relevant industrial sectors.

Sincerely,

Robert D. “Skip” Rung
President and Executive Director
March 7, 2016

Oregon Talent Council,

This letter is in support of the proposal to create the "Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE)" Program at Oregon State. As the Research and Development Director for the Willamette Valley Company I understand the need and fully support the development T-shaped workers who not only possess technical depth but also the critical, and often academically overlooked professional, leadership and business skills. It is imperative that scientists and engineers of the future understand and address markets needs while working to innovate and the blending of professional development and the Lens of the Market business content will do just that.

Over the past 16 years we have worked closely with the Graduate Internship Program at UO and have been thoroughly impressed by the professional and technical preparation of the students who have come through there – we have extended offers to the majority of them upon completion of their internship. It excites me to see that the BRIDGE program will be working with the UO program leadership to develop and deliver the professional content that has been honed over the years. In support of these efforts we are willing to participate on the Industry Advisory Board to help guide, launch and evaluate the success of the BRIDGE program. We are also willing to participate as an internship host company for its students.

I wholeheartedly support creating more T-shaped scientists and engineers through the Oregon State BRIDGE proposal to OTC.

Sincerely,

Curtis Burton
R&D Director
Willamette Valley Company
March 7, 2016

Dear Oregon Talent Council:

I am submitting this letter in support of the program proposal being developed at Oregon State University. As the CEO for Inpria, a startup focused on commercializing novel photoresists – speciality chemical materials central to semiconductor manufacturing – having access to science and engineering workers with the skills necessary to professionally engage with people across all business units and create market driven innovations is crucial. We have a very real and immediate need to have access to skills and talents that can be found in T-Shaped professionals. To have a program that not only acknowledges but creates the sustainable structure to build skills that facilitate working in diverse teams, adapting to changing environments and technologies, market analysis alongside technical expertise will be a boon not only to our company, but to companies across the State.

We look forward to serving on the Industry Advisory Board to support and shape the modules such as Lens of the Market and Professional Engagement as well as to ensure students are able to effectively put these tools to work during their internship. The ability to build and tap into a network to solve problems, to present new ideas in a coherent and professional manner, and to interpret market data to shape research and development plans will set these students apart. The BRIDGE programs content around developing T-Shaped individuals creates a new standard that allows host companies to be confident in the quality of their interns, and the development of Oregon’s workforce.

In conclusion, we strongly support this program proposal and are eager to engage.

Sincerely,

Andrew Grenville
CEO, Inpria
To: Oregon Talent Council (OTC)

Re: Oregon State Proposal to Bridge the STEM Professional Innovation Gap (BRIDGE)

This letter is submitted in support of the “Bridge the STEM Professional Innovation Gap (BRIDGE)” program proposal being developed at Oregon State University. Oregon needs more programs that grow T-shaped workers and the BRIDGE program does just that. This program not only acknowledges this need but creates the sustainable model to build the skills that facilitate STEM personnel to work in diverse teams, adapt to changing environments and technologies, and understand market needs. This will be a boon not only to our company, but to companies across the State.

In my role as the CEO for Polaris Battery Labs, I interface with a broad array of material developers, OEM’s, battery startup’s and Universities to provide R&D services to clients looking to bring their unique new materials into lithium ion rechargeable battery products. With our strong background in chemistry, cell design, and testing our goal is to accelerate the launch of our customers’ new products into full production. Since our start in 2012, Polaris has worked hard to build and grow a local network of support that includes strong relationships with the University of Oregon, Oregon State University and the Oregon Institute of Technology. We have had interns working at Polaris from each of these Universities with backgrounds in chemistry and renewable energy systems that have made significant contributions to Polaris and to the development of better batteries by our clients. So from a Polaris perspective, it is clear that having access to STEM professionals entering the workforce with the skills necessary to engage with people across business units, interface with external partners, and create market driven innovations is highly desirable.

I look forward to working with the Industry Advisory Board to help shape the content of the BRIDGE program and to provide feedback on how these students are able to put their skills to work initially as interns and later as experienced professionals. The ability to build and tap into a network of proven problem solvers will be very helpful as we continue to grow our company. The BRIDGE program’s formalization of content around developing T-Shaped individuals creates a new standard that allows host companies like Polaris Labs to be confident in the quality of their interns, and the development of Oregon’s future workforce.

Sincerely,

Doug Morris, CEO

Polaris Battery Labs, LLC
Beaverton, OR 97008
Office: 971 246-5066
dmorris@polarisbatterylabs.com
www.polarisbatterylabs.com
March 2, 2016

Oregon Talent Council,

I am writing in support of the Oregon State University “Training to Bridge the STEM Professional Innovation Gap (BRIDGE)” proposal. As an R&D director in a company that hires many STEM professionals in Oregon, I believe this program will fill a key gap between the academic training of STEM graduates and the real needs of the technology workplace.

Technology companies are always seeking employees who are proficient in a combination of technical, professional, leadership, and innovation skills. We need professionals who are well-versed in both technical and business fundamentals. These so-called T-shaped professionals are the core of any technology workforce. But unfortunately, finding this blend of skills in new graduates is extremely rare. The OSU BRIDGE proposal provides a path to close this gap by creating a new, valuable and agile pool of talent who would enter the workforce ready to contribute to core operations and growth of companies like HP.

At HP we rely heavily on student internships to create our hiring pipeline for STEM talent. The combination of OSU’s proven business, innovation & leadership, Lens of the Market (LoM) program with an expanded graduate internship program creates a unique and powerful combination that will make BRIDGE interns and graduates highly sought out by Oregon employers. I am also encouraged by the online component of the BRIDGE program that will enable companies to expand BRIDGE training to include our current workforce.

I fully support the OSU BRIDGE proposal. I hope that with your support, HP will have the opportunity to start bringing BRIDGE participants into our company in the near future.

Sincerely,

Cheryl A MacLeod, PhD
Director of Advanced Technology Platforms
HP Inc
To: Oregon Talent Council  
Re: Letter of support for Training to Bridge the STEM Professional Innovation Gap (BRIDGE)  
From: Bill Cowell, PhD

My name is Bill Cowell, and I would like to offer this letter of support for the “Training to Bridge the STEM Professional Innovation Gap (BRIDGE)” proposal to the Oregon Talent Council. I participated in the first phase of the Lens of the Market program (LoM), offered by the CSMC, in 2012, while enrolled as a PhD candidate at Oregon State University. LoM is a central component to the BRIDGE proposal. Later in 2012, after successfully defending my PhD dissertation, I co-founded Amorphyx Inc., a startup with the goal of commercializing the electronic materials/device technology that I developed through my PhD research. I worked for Amorphyx through September, 2014. LoM provided important impetus towards the founding of Amorphyx. Not only did LoM activities provide me with tools to assess the viability of Amorphyx, but it also provided access to individuals with expertise in technology startups to gain a deeper perspective regarding the path that I was considering. In the end, the evaluation of the business plan and general company viability gave me the confidence to start Amorphyx.

During my time with Amorphyx, I worked on campus at OSU, and had time to observe the impact of the LoM on graduate researchers at OSU. The program forced researchers outside of their comfort zones. Graduate students in science and/or engineering often do not look beyond the research that they are working on. Looking at ideas from a business perspective, not only a technological perspective, pushed the researchers to expand their frameworks. Additionally, the manner in which the program fostered teamwork in the small groups provided access to soft-skill training that is often overlooked in graduate education. The engineering/science collaborations that I observed in LoM small groups provided participants with a rich experience that will be valuable in any future career: academic, corporate, or startup.

In my role at ON Semiconductor, I am evaluating options towards increased innovation in the Corporate Research and Development (CRD) group. I am in the process of determining how I can engage the LoM program at ON Semiconductor. I feel that exposure to LoM will increase the CRD group’s understanding of effective innovation, and will improve the execution of innovation based projects.

I truly believe that LoM is an invaluable asset to OSU, and should be expanded to the rest of the Oregon University System and also to corporate partners in Oregon. OSU, through LoM, has brought to the Pacific Northwest a truly unique program that aids career development while simultaneously advancing entrepreneurship within chemistry. I warmly support the BRIDGE proposal.

Respectfully,

Bill Cowell, PhD
March 6, 2016

Douglas A. Keszler  
Department of Chemistry  
Oregon State University  
Corvallis, OR 97331

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled “Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE).” This commitment will include our willingness to accept interns from your program in our company and to provide feedback on their performance. We expect to have space for 2-3 interns from your program for Summer 2017.

I am excited by the potential to have access to agile emerging workers who are nimble and responsive to changes in their environment with the applied skills such as critical thinking, project management and business acumen to support our growing smart chemical manufacturing business. On behalf of Valliscor, we look forward to working with you in this endeavor.

Sincerely,

Michael C. Standen, Ph.D.
March 8, 2016

Oregon Talent Council

Re: BRIDGE Program at OSU

Dear Oregon Talent Council representatives:

It is with great enthusiasm that I submit this letter in support of the “STEM Professional Innovation Gap (BRIDGE)” Program at Oregon State University. This program will create a new generation of Oregon high tech employees who are able to positively impact success in small companies like ours by being able to engage in collaborative R&D efforts that are informed by market needs. As the CTO and Co-Founder of Pacific Light Technologies, an Oregon nanomaterials startup, I know first-hand how critical it is to have scientists who are able to communicate and solve problems that are both technical and business-related. It’s also critical that they make the transition quickly from academia to industry and contribute right away to the problem they were hired to help solve.

Providing a training program which focuses on relevant professional and business training for scientists and engineers at all levels will produce interns and employees able to contribute in a fraction of the time as those coming from traditional academic programs. These T-Shaped individuals will develop into the upcoming leaders of their STEM fields, and future innovators in the Oregon workforce. I believe that the BRIDGE program addresses a critical need to develop the agile and innovative workforce necessary to support Oregon companies.

We look forward to working with the BRIDGE program to support their efforts to prepare tomorrow’s STEM professionals.

Sincerely,

[Signature]

Dr. Juanita Kurtin
CTO, Pacific Light Technologies
(971) 235-1427
March 8, 2016

Oregon Talent Council
Employment Department
State of Oregon

Dear Oregon Talent Council,

I am writing in support of the “STEM Professional Innovation Gap (BRIDGE) Program” proposal submitted by Oregon State University. The program builds a curriculum with key, and often overlooked, professional and business ingredients for STEM worker success. Individuals trained in the BRIDGE program will have enhanced opportunities to engage the people, technology and markets that drive innovation. In my current position as Director of Advanced Technologies Integration for Qorvo, I find the highest level of professional development is found in those who possess both an excellent technical depth and have the ability to negotiate the difficult interpersonal aspects of stressful high tech positions. T-Shaped individuals trained through the BRIDGE program, will provide a more productive, engaged and adept workforce for our state, industry and technology corporations such as Qorvo.

I am aware through my personal experiences as a technical manager the vital impact of these often-overlooked skills. The modules developed in the BRIDGE program ensure that the technically proficient students emerging from Oregon State University will also be trained in essential professional attributes – possessing the skills to effectively network, communicate across diverse groups, and quickly adapt to ever changing technical challenges. These skills, in conjunction with a strong business acumen, drive the BRIDGE program forward as a leader in STEM education.

I am pleased to lend my support to this program, and as an OSU alumnus, look forward to working with the OSU team, its students and other company partners to make it successful.

Sincerely,

Frederick Pool, Ph.D.
Director, Advanced Technologies Integration
Qorvo
March 1, 2016

Douglas A. Keszler  
Department of Chemistry  
Oregon State University  
Corvallis, OR 97331  

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled "Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE)." This commitment will include our investment of service on your External Integration Council (EIC) to ensure the expansion of this program to the Eastern Oregon University (EOU) Campus and our diverse population as a post-grant activity.

BRIDGE modules are ideally matched for our existing efforts here at EOU including a recently funded NSF grant entitled "Advancing Science and Technology in Eastern Oregon" for which I am the Principal Investigator (PI). This grant provides scholarships and support services in Science, Technology, Engineering, and Mathematics (S-STEM) to academically-talented students majoring in biology, chemistry-biochemistry, computer science, and mathematics who demonstrate financial need. One specific aspect of this grant is to contribute to regional economic development by preparing well-educated graduates who enter STEM-related professions. Your BRIDGE program will provide immediate impact for the regional economy and employment opportunities for EOU graduates.

I see tremendous potential through our shared vision to educate and train agile emerging workers who are nimble and responsive to changes in their environment with applied skills such as critical thinking, project management and business acumen. Such workers will be well equipped to support several of the top professional and technical occupational clusters identified in the Oregon Talent Plan and will help to grow the Oregon economy and Oregon companies. I look forward to working closely with your group to ensure success in the pilot program at OSU and the expansion throughout the state of Oregon including at Eastern Oregon University.

Sincerely,

Anna G. Cavinato, Ph.D.  
Professor of Chemistry  
Eastern Oregon University
March 8, 2016

Douglas A. Keszler  
Department of Chemistry  
Oregon State University  
Corvallis, OR 97331

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled "Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE)." As we understand it, the grant will result in a statewide summer internship network for STEM undergraduates and a series of online modules that provide professional development opportunities for STEM undergraduates to better prepare themselves for careers in business and industry.

As a partner, Southern Oregon University will have access to the internship network to assist our students in finding summer placements. In addition, you will give permission to Southern Oregon University (SOU) to utilize the online modules in our instructional programs at little or no cost, both as post-grant activities. As a partner, we agree to advise your team on the portability of the modules under development and their potential utilization at Southern Oregon University (SOU) to assist you in developing learning modules that have the potential to be widely adopted.

We look forward to engaging with you on this endeavor to educate and train agile, emerging workers to grow the economy and Oregon companies in the southern Oregon region. We look forward to working closely with your group to ensure success in the pilot program at OSU Corvallis. We are excited about the potential of expansion of this program to SOU and the benefits it may provide our students, both through summer internships and the online career preparation activities that will aid them in being successful in these internships and their future career paths. We are committed to the goal to produce graduates who are nimble and responsive to changes in their environment with the applied skills such as critical thinking, project management and business acumen.

Sincerely,

Sherry Ettich, Director of the Science, Technology, Engineering and Mathematics Division and Professor of Mathematics

Vicki Suter, Director of the Center for Instructional Support

Jeffrey Gayton, University Librarian and Learning Commons Director
March 4, 2016

Professor Douglas A. Keszler  
Department of Chemistry  
Oregon State University  
Corvallis, OR 97331

Dear Professor Keszler,

It is pleasure to provide this letter of intent to be a partner for your 2016 Oregon Talent Council application entitled “Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE).” My support of post-grant service on your External Integration Council (EIC) is intended to ensure that expansion of this program reaches the Oregon State University-Cascades branch campus and our diverse population, including non-traditional and first-generation students.

The BRIDGE modules are well-suited for our current efforts at OSU-Cascades to build a vibrant internship ecosystem for our undergraduates, especially those from the STEM arenas. The Central Oregon region (including Bend, Redmond, Sisters, and nearby cities) supports a broad collection of high-tech and science-focused businesses that are well aligned with the Oregon Talent Council’s profession and technical clusters. From my vantage point as the Bend Bioscience Consortium (bendbio.org) steering committee chairperson, and as sole full-time chemistry faculty member at OSU-Cascades, there is a clear benefit of the BRIDGE program for both OSU-Cascades students and local firms in the bioscience and healthcare industries. Examples in Bend include the large St. Charles Health System and pharmaceutical firms Capsugel and Patheon, each of which continue to demonstrate attention toward OSU-Cascades students for internships and employment. It is anticipated that your BRIDGE program will provide immediate impact for the regional economy and employment opportunities for OSU-Cascades graduates.

Faculty and leadership at OSU-Cascades strive toward high-impact opportunities such as local, regional, and state-wide internships for our undergraduate students. The potential to work synergistically with the efforts in Corvallis to accomplish the shared goal to produce undergraduates in the STEM fields who possess an agile approach to the dynamic and demanding STEM workplaces using applied skills such as critical thinking, project management and business acumen is critical to our efforts. I look forward to working closely with your group to ensure success in the pilot program at OSU Corvallis, and to assist in the expansion throughout the state of Oregon, including at Oregon State University – Cascades.

Sincerely,

Jeff T. Gautschi, Ph.D.  
Organic Chemistry Instructor  
Department of Chemistry  
Oregon State University and OSU-Cascades
March 4, 2016

Douglas A. Keszler
Department of Chemistry
Oregon State University
Corvallis, OR 97331

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled “Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE).” This commitment to work with your team will include enabling future utilization of aspects of this program on the Portland Community College (PCC) Rock Creek campus and our diverse population as a post-grant activity. I look forward to engaging with you on this endeavor to educate and train agile, emerging workers to grow the economy and Oregon companies in the Portland region.

We see tremendous potential for tapping the demand for STEM professionals through this effort. Agile workers with the applied skills that your program will provide are what the employers are looking for. Being a community college, we currently do not offer such a program to our general student population. In addition, I am excited about the possibilities this grant would offer for statewide contacts for internship opportunities.

I look forward to working with your team to accomplish this goal and I will share this effort with the other campuses at PCC. I see great potential for integration and augmentation using this BRIDGE within our existing programs at PCC.

Sincerely,

Nancy Pitzer

Nancy Pitzer
Coordinator, Jobs & Internships
Portland Community College, Rock Creek Campus
March 1, 2016

Douglas A. Keszler
Department of Chemistry
Oregon State University
Corvallis, OR 97331

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled "Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE)." This commitment to work with your team will include enabling future utilization of aspects of this program on the Southwestern Oregon Community College (SOCC) campus and with our diverse population as a post-grant activity. I look forward to engaging with you on this endeavor to educate and train agile, emerging workers to grow the economy and Oregon companies in the Coos Bay region.

Sincerely,

Mike T Springer
Chemistry
Southwestern Oregon Community College
March 3, 2016

Douglas A. Keszler  
Department of Chemistry  
Oregon State University  
Corvallis, OR 97331

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled “Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE).” This commitment will include our investment of service on your External Integration Council (EIC) to ensure that expansion of this program to the Oregon Coast Community College and our diverse population as a post-grant activity.

BRIDGE modules are ideally matched for our existing efforts here at OCCC to build a vibrant internship ecosystem for our students. Your BRIDGE program will provide immediate impact for the regional economy and employment opportunities for OCCC students.

The potential to work synergistically with the efforts in Corvallis to accomplish our shared goal to produce agile emerging workers who are nimble and responsive to changes in their environment with the applied skills such as critical thinking, project management and business acumen is key to our efforts. I look forward to working closely with your group to ensure success in the pilot program at OSU Corvallis and the expansion throughout the state of Oregon including at Oregon Coast Community College.

Sincerely,

Cindy E. Carlson, M.Ed., Ed.S.  
Dean of Students and Instruction  
Oregon Coast Community College
March 4, 2016

Douglas A. Keszler
Department of Chemistry
Oregon State University
Corvallis, OR 97331

Dear Professor Keszler,

This letter of commitment recognizes our intent to be a partner for your 2016 Oregon Talent Council application entitled “Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE).” This commitment to work with your team will include enabling future utilization of aspects of this program on the Blue Mountain Community College (BMCC) and our diverse population as a post-grant activity. I look forward to engaging with you on this endeavor to educate and train agile, emerging workers to grow the economy and Oregon companies in the Hermiston and Pendleton regions.

We see tremendous potential for tapping the demand for STEM professionals through this effort. As an institution that focuses on student success, particularly of under-represented minorities, the BRIDGE program will provide us with resources to better prepare all of our students to meet regional and national workforce needs. It will also give us the tools to help cultivate advancement in members of our current, local workforce. I look forward to working with your team to accomplish this goal. I see great potential for integration and augmentation using this BRIDGE within our existing programs at BMCC.

Sincerely,

Alexzandra Murphy, Ph.D.,
Precision Irrigated Agriculture Coordinator
Blue Mountain Community College
2121 S 1st Street, Hermiston, OR 97838
2411 NW Garden Ave, Pendleton, OR 97801
Phone: 541-567-6337 Ext 113 | email: amurphy@bluecc.edu
March 03, 2016

Oregon Talent Council,

We are writing this letter in support of the proposal entitled Training to Effectively Bridge the STEM Professional Innovation Gap (BRIDGE).

Strong technical knowledge, well-developed leadership skills, and a broad worldview are core values of the College of Engineering and The Oregon State Engineer™. We are always seeking opportunities to collaborate and optimize individual and collective strengths. The proposal, assembled by Keszler, Carter, Larson, and Giordan, describes a program with many parallels to the College of Engineering’s Leadership Academy, a program that enhances students’ leadership skills and perspectives through structured seminars/workshops, facilitates connections with industry mentors, and assures completion of internship experiences to connect learning to context and bolster workforce readiness.

As the College of Science works to establish the BRIDGE program and bring even more experienced corporate and industrial leaders to the undergraduate and graduate-student populations at OSU and beyond, we will work cooperatively to the mutual benefit of BRIDGE and the College of Engineering Leadership Academy. This partnership will enable more effective use of resources, stronger partnerships, and ultimately, a more capable Oregon workforce.

We look forward to working with the team to create opportunities for all of our students, addressing needs across OTC-relevant industrial sectors encompassing the engineering enterprise.

Sincerely,

Christine Kelly, Association Dean
Academic and Student Affairs
College of Engineering
Oregon State University

Scott Paja, Director
Leadership and Professional Development
College of Engineering
Oregon State University
March 1, 2016

Members of selection committee of the Oregon Talent Council:

I am writing this letter to support the proposal entitled *Training to Effectively Bridge the STEM Professional Innovation Gap*. Continuous Improvement and Innovation are two of the five core values of the College of Public Health and Human Sciences. We are always seeking innovative approaches to optimize individual and collective strengths. The proposal, assembled by the team of Keszler, Carter, Larson, and Giordan, describes a unique way to enhance the professional development of our students through the lens of innovation, leading to internship opportunities. Bringing a large cadre of experienced corporate and industrial leaders to the undergraduate and graduate-student populations at OSU will certainly prove to augment student success, while also paying substantial dividends through a more capable Oregon workforce.

The proposers have worked closely with industry and academic leaders to align needs across OSU units as well as campuses across the state. For these reasons, the program should quickly approach a level of participation that will ensure sustainability. I will work closely with them to ensure that the program endures.

I very much look forward to working with the team to create opportunities for our students, addressing needs across Oregon Talent Council-relevant industrial sectors encompassing the health enterprise.

Sincerely,

Tammy Bray, PhD
Dean