

APPLICATION COVER PAGE  
(Please Print or Type – All Fields Must Be Completed)

Project Name: Hood River CTE Revitalization
Amount Requested: \$437,991

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	Participating High School or Middle School Name <small>(add additional rows as needed)</small>	Lead Contact Name	Grade Levels	Student Enrollment
1.	Hood River Valley High School	Jeff Blackman	9-12	1,440
2.				
3.				
4.				

Please check all that apply:

This project directly involves Career and Technical Student Organizations  
Please note page of proposal that describes this relationship. Page: 5, 6, 12, 13,

This project has a clear connection to STEM  
Please note page of proposal that describes this relationship. Page: 1-20\*

**This project focuses on the Engineering and Ag Science-Welding Programs of Study at Hood River Valley High School. Virtually the entire project is focused on STEM.**

## **PART A. PROJECT OUTCOMES AND PROGRESS MARKERS**

Last year, Josh, a high school junior without much enthusiasm or interest in school signed up for *Pre-Engineering – Intro to Robotics* at HRVHS because he needed another elective. He didn't have a stellar GPA, was never particularly engaged in school and he didn't think he would ever use anything he learned in school in real life. By the end of his first semester, Josh had mastered the software program SolidWorks and designed several projects that came to life through the school's small 3-D printer. His Engineering Teacher, Jeff Blackman, contacted Prigel Machine (a small machine shop in Hood River that focuses on manufacturing aeronautic and automobile parts) about a summer internship for Josh. The manager agreed. They treated Josh just like a regular employee and the internship was a huge success for both Josh and Prigel. They even utilized some of his designs in their projects. Josh is now back in school for his senior year and his entire attitude about school and his outlook for his future have completely turned around. Plus, Prigel has offered to help with his college expenses.

This is the extraordinary story of one student; through this grant, we want this story to become simply ordinary for many students. We want to inspire students so they can see the connection between school and 'real' life. And, then, we want to build a direct pathway from the classroom to the design room at Boeing/Insitu or to the server building at Google or to the classroom at the college or to the floor at any number of other design and build manufacturing businesses around the Gorge.

The overall goal of the CTE program, and this grant, is to provide more students with more access to STEM-related technology, manufacturing, and design skills that will lead to more educational opportunities and more work opportunities.

HRVHS will work to meet these goals by revitalizing two of its CTE Programs of Study, the Agriculture Science – Welding program and the Engineering program. Through this project, we will replace some of the machinery in our shop – machines that date back to World War II. Specifically, we will purchase 30 new computers, 3-D software for each new computer, a Haas Mini-mill CNC machine, 16 PowerWave welders, a CNC router, a Torch Mate2 CNC plasma cutter, and two 3-D printers. All of this new equipment will enable HRVHS achieve the outcomes listed below which include increased student participation in CTE programs, increased student academic success in both CTE and core curricula as well as more hands-on, experiential learning opportunities that develop more of the skills students need to either move on to college or join the local workforce.

This project will produce the following outcomes and progress markers:

**1) INCREASE PARTNERSHIPS WITH BUSINESS, INDUSTRY, LABOR, AND EDUCATION PROVIDERS**  
Currently, the CTE Program at HRVHS has active partnerships with several local businesses in the community in both Engineering and Welding. Through the **Engineering** program of study (POS), we have partnerships with Google, which operates a full Data Center in The Dalles; Insitu, a subsidiary of Boeing that is the world's foremost developer of unmanned aircraft; as well as a number of hi-tech businesses that feed Insitu and other manufacturers around the world, including the US Dept of Defense. These other businesses include Cloud Cap, Hood Tech, Sage Tech, and Prigel Machines (among others), each of which employs 10–40 people.

Through the **Welding** POS, the teachers have developed relationships with local businesses including Schlosser Machine Shop, Hogg & Davis, Champion Tool Storage, and Kellogg Welding, among others. We have also worked with several independent

welders in the area. The demand for certified welders is on the rise again in the Gorge as the construction industry begins to recover from the recession. Further, skills student learn in Welding can be transferred to any number of other manufacturing processes.

These Engineering and Welding partners have provided financial and volunteer support for programs and various activities as well as insight, input and information about their needs in the 'real' world, which has helped the CTE program focus its efforts to meet those needs through this proposal and the overall program .

Both programs of study – engineering and welding – have strong relationships with the Columbia Gorge Community College (CGCC), which has campuses in Hood River and The Dalles. For example, CGCC does not have welding facilities at its Hood River campus so it contracts with HRCSD to provide a welding program for CGCC students and community members seeking their certification or recertification in welding. The Welding program also partners with the Blue Mountain Community College in Pendleton to provide students with dual credit for Advanced Welding. We hope to increase the credits available at Blue Mountain and offer the same dual credits for CGCC, which is only two miles from the high school. (It should be noted that CGCC only recently received its own independent accreditation. This will make it easier for HRVHS to align its CTE POS with the programs at the College.)

Through this grant, HRVHS will strengthen and expand its relationships with local businesses and community colleges and achieve the following outcomes:

**Outcome 1A) Increase the number of business partners with in both areas.**

Engineering: currently we partner with 6 businesses; this will increase to 15 within the first year and to 30 in the second year;

Welding: currently we partner with 4 businesses; this will increase to 10 within the first year and to 15 in the second year;

**Outcome 1B) Increase financial support from partners.**

Currently, Engineering receives \$10,000 – \$15,000 for robotics and electric car projects, and Welding receives \$2,400 for a handful of programs through donations and grants. We will double this amount of financial support in the first year for both programs.

**Outcome 1C) Strengthen the relationships through increased communication.**

- ~ Increase communication with partners from a current ‘as-needed’ basis to once per month (12 contacts/year) via email, meetings, and visits the school.
- ~ HRVHS will join the Gorge Technology Alliance – a consortium of local tech businesses that hosts workshops and networking activities for members.

**Outcome 1D) strengthen the relationship with education providers.**

- ~ Increase the number of dual credit students at Blue Mountain Community College in Pendleton in welding from 5 to 15 each year.
- ~ Establish an additional dual credit course with CGCC in both welding and engineering.
- ~ Establish a Pre-Engineering degree program at CGCC.

**2) IMPROVED STUDENT ACCESS TO CTE PROGRAMS OF STUDY.**

With this grant HRVHS will improve student access to its CTE programs over the course of the new three years. In year 1, HRVHS will offer both before- and after-school programs in the two programs. In years 2 and 3, HRVHS will work to increase the number of classes offered and the types/levels of classes offered in the Engineering and Welding. Specifically, we will work to achieve the following outcomes:

**Outcome 2A) offer classes both after-school in the two programs.**

- ~ Engineering: increase number of days of after-school programming for robotics from 1 day/wk to 3 days/wk;
- ~ Welding : develop before school programs for students 3 days/week  
: develop after-school programs for students 3 days/week

**Outcome 2B): increased number of classes available for students (by ‘15-16 SY)**

- ~ Engineering: Increase from 3 classes to 6 classes offered.
- ~ Welding: Increase from 7 classes to 9 classes offered.

**Outcome 2C): increased the types and levels of classes offered (by ‘15-16 SY)**

- ~ Engineering : Add 2 sections of 3-D CAD; 1 beginning and 1 advanced.  
: Add 1 section of computer science.
- ~ Welding : Add 2 sections of welding; 1 beginning and 1 advanced.

**Outcome 2D) increase staffing capacity (if budget constraints allow)**

- ~ Engineering: increase current CTE teacher from .5 to 1.0 FTE.
- ~ Welding: increase current welding staff from 1.6 to 2.0 FTE.

### **3) INCREASED RIGOR IN TECHNICAL AND ACADEMIC CONTENT**

HRVHS will continue to increase the technical and academic content of the engineering and welding, e.g., in both POS, each student will learn a CAD software program. This skill not only enables students to show sufficient proficiency in math and science, but it also provides students with a real-life skill set that potential employers look for in new employees.

The rationale for training in CAD software comes directly from our local business partners. As one of the attached letters of commitment states, “there is a need for Engineers and CAD technicians in this area.” Thus, this project will enhance HRVHS’ ability to align its program with industry recognized technical standards and employability skills. The measurable markers for this outcome will include the following:

#### **Outcome 3A) Increase number of student ‘fluent’ in CAD software every year**

Engineering: 60 students in year 1, 60 year 2, etc.

Welding: 60 students in year 1, 60 in year 2, etc.

Because the computers and software will be used every year, these numbers will only increase each year.

### **4) INCREASED CAREER OPPORTUNITIES INCLUDING CAREER AND TECH STUDENT ORGS.**

In addition to internships, job shadows, and in-classroom community projects described elsewhere in this proposal, HRVHS also has a thriving FFA club. In fact, the FFA Club is the largest club in the high school with 100 members. The Club was honored as the Agricultural Program of the Year by the Oregon Dept. of Education in 2008. Further, every year, more than 25 FFA Club members compete in the Regional Shop Skills Contest, which includes a welding component. The HRVHS FFA Club has won this Regional competition every year since 2006. Unfortunately, we currently don’t

have enough machines for all of these students. This project can change that.

Similarly, Engineering students compete in the FIRST Robotics FTC competition. In 2012, HRVHS team Blue Steel (an all-girls team) went all the way to the World Championships in St. Louis. This year the Engineering program has eight FTC teams and would like to expand to include two FRC teams. HRVHS also offers an Electric Car class that competes in the Electrathon America race series. This year, E-car students are building eight cars and plan to compete in the Shell Oil Co. Alternative Energy Race. Measureable markers for this goal will include the following:

**Outcome 4A)** Increase number of students who participate in FFA by 20% in year 1 from 100 to 120 students.

**Outcome 4B)** Expand robotics to include two FRC teams of 15 students each.

**Outcome 4C)** Expand the electric car program to compete in more races.

**5) IMPROVED ABILITY TO MEET WORKFORCE NEEDS IN THE REGION.**

The CTE program at HRVHS has developed a Business Advisory Committee designed to secure support for the CTE program and to keep teachers informed about the skills local employers need in their employees. These skills include, *general skills* of taking a project from concept to design to fabrication to delivery; the *concepts skills* of critical thinking and problem-solving; and more *specific skills* such as reading blueprints, operating machines properly, and completing a project. In order to develop these skills, the CTE teachers have designed their classes to provide as many experiential learning opportunities as possible through internships and the community projects described below. With this grant, HRVHS will expand these efforts and produce the following:

**Outcome 5A) Improved skills for students upon graduation.**

*Engineering & Welding:* ensure that every student is fluent in CAD software when they graduate

*Welding:* ensure 10 students graduate with their welding certificate

**Outcome 5B) Increased employer-based projects in the classroom**

*Engineering:* partner with local engineering firms on community projects that can be worked on in the classroom. Every engineering student will work on at least one business/community project each year.

*Welding:* partner with local government and local businesses on welding projects that can be built in the classroom. Every welding student will participate in at least one community project like these each year.

**Outcome 5C) Increased number of internships for students**

*Engineering:* increase internships from last year's 4 to 20 in year 2.

*Welding:* increase internships from last year's 5 to 20 in year 2.

Further, a minimum of 20 students will participate in the job shadow program to help students prepare for entry-level employment.

**Outcome 5D) increased variety of internships for students.**

HRVHS will work with local business partners to design different levels of internships including long-term (summer and afterschool); short term (week-long); and during student off-site class periods during the school day. Our goal is to place at least 3 students in each level of internship for each program of study.

**B. CAREER AND TECHNICAL EDUCATION PROGRAM OF STUDY DESIGN**

Through this grant, HRVHS will enhance the Engineering and Ag Science-Welding programs of study (POS), both of which are fully approved by the State of Oregon. Both were updated and approved in 2012 and both meet all five elements necessary for a robust CTE program – standards & content, alignment & articulation, accountability & assessment, student support services, and professional development.

**Engineering** currently offers three classes: Engineering I(Robotics); Engineering II (Advanced Robotics); and Engineering II (Electric Car), which are all full with 30 students each year. These classes are aligned with state standards in Algebra, Geometry, and English Language Arts. Students apply math concepts such as ratios, volume, and trigonometry in the engineering design principles. Additionally, student written work must meet the HRVHS English department and Writing 121 standards.



Further, the Engineering classes are designed to prepare students to enter the Renewable Energy Technology (RET) program at CGCC by helping students develop skills such as mechanics and electrical theory.

Overall, students will be assessed in 3-D CAD software design and the engineering process using the software curriculum. Students will also prove their proficiency in computer science by using the RobotC curriculum designed by Carnegie Mellon University. HRVHS will demonstrate their technical skills through the National Occupational Competency Testing Institute (NOCTI) Pre-Engineering/Engineering Technology tests. This student assessment plan was created and implemented with the support of the Business Advisory Committee that includes representatives from Google, Insitu, and Hood Tech.

Through this grant, HRVHS will be able to expand the Engineering POS to offer CAD design and rapid prototyping to its list of classes. Teachers will be trained to use 3-D software and Rapid Prototyping through the the SolidWorks provider in Portland and local business expertise. Over the next several years, HRVHS will implement the following professional development plan for Engineering students that the Engineering Department and the local Business Advisory Committee designed.

Year 1 – introduce basic CAD design in Engineering I classes;

Year 2 – Expand CAD design into Robotics 2 and Electric Car classes;

Year 3 – Introduce Rapid Prototyping in Engineering I, Robotics, & E-car classes;

Year 4/5 – Offer one-year class in Prototyping and CAD design with SolidWorks;

Further, HRVHS, and the CTE department in particular, have a strong relationship with both the Columbia Gorge Community College, which has campuses in Hood River and

The Dalles and Blue Mountain Community College in Pendleton. With the updated software, computers and machinery, we will work with the Community College to determine if the existing engineering classes and the planned new classes in CAD Drafting can be articulated at the college and be considered for dual credit.

The **Welding** POS's classes are all fully aligned with State standards, the Oregon Skill Sets, and they are designed to meet industry-recognized standards and employability skills. Currently, this POS offers three Beginning Welding courses, and two Advanced Welding courses. The two advanced classes, Ag Welding & Fabrication and Ag Mechanics & Construction, are already articulated with Blue Mountain Community College in Pendleton and students can earn college credits while still in high school. Each of these courses is full with 26 students each year. In addition, Welding offers a girls-only metals class that is also full every year. Through this grant, the Welding department will work to have the same classes articulated at the Columbia Gorge Community College, which just recently received its independent accreditation.

In the Welding program, similar standards apply to students who will be assessed in 3-D CAD software design as well as Math, Geometry, and Language Arts. The Welding students' written work must also meet the HRVHS English department and Writing 121 standards. To assess student technical skills, the teachers have recently adopted a new, independent assessment that requires that students score a 3 (on a scale of 5) in four categories: Blueprints, Project Design, Fabrication, and Presentation. Once a student achieves proficiency in these skills, they will have met the diploma requirements and are ready to approach any employer with a baseline of knowledge.

The HRVHS welding teachers want to take these skills and assessments to the

next level and develop a certification program that will provide students with a certificate that demonstrates their ability to complete different welding processes. This is in direct response to local employers need for more certified employees. It should be noted that the Welding department already provides the staff and equipment for Columbia Gorge Community College's welding program. With this grant and the new programs and equipment it will help provide, HRVHS will be able to provide more students with the technical job skills they need to work in local businesses immediately after graduation.

Given the coursework and partnerships with both local industries and community colleges, there can be little doubt that these two programs of study are providing a pathway for students to pursue high-wage and high-demand jobs in the region.

### **C. UNDERSERVED STUDENTS-ACTIVITIES INTENDED TO RECRUIT & SUPPORT**

Hood River County School District serves a wildly disparate socio-economic population and it works to include traditionally underserved students in every aspect of our schools. With the hustle and bustle of downtown Hood River in the summer months, it is easy to miss the fact that 58% of our students District-wide are eligible for the Federal Free/Reduced Meal program. The economic gap in our District increases the further one travels from downtown Hood River. Seven miles south of Hood River the community of Odell is home to Mid-Valley Elementary and Wy'east Middle School, where the Free/Reduced Meal rates jump to 72% and 71%, respectively. At Parkdale Elementary, another 13 miles south, 71% of students are eligible. And, in Cascade Locks, 20 miles west of Hood River, 68% of our students are eligible for the program.

Additionally, across the District, 60% of our students are native Spanish speakers and come from homes where Spanish is the primary language spoken. At Hood River

Valley High School, 42% of students come from Spanish speaking homes.

This project will work to include these traditionally underserved students through a variety of strategies. First, we will develop more accessible and less intimidating entry-level classes in engineering that will introduce more students to engineering. Second, the CTE teachers will work with the Guidance Office to reach out to more students who the counselors think would be a good fit for either of the Engineering or Welding programs. Third, the CTE teachers will work with the Middle School teachers to help identify particular students who may be a good fit for the engineering classes.

The Welding program currently offers an introductory class designed and presented just for girls. One of our goals will be to move these girls into the next level of classes when they complete Tech Survey for Women. Further, the Welding program is also relatively successful at including Hispanic students; currently just over 40% of the students in the Welding program are Hispanic. Through this project, we will offer more classes and provide more value from current classes, i.e., welding certification upon completion for the program. We expect this combination to increase the number of **all** students who select the welding program, including traditionally underserved students.

Additionally, in order to enroll more underserved students, the CTE program will conduct outreach to target some of these specific groups of students. For example, every year, the High School throws a party – First in Family – for those students who are the first in their families to graduate from high school. This is a very popular evening with parents, students, and younger siblings. It is a way for the school to publicly acknowledge the work of the graduating seniors, while instilling the importance of graduation in parents and younger students.

We will also use current students to reach out to other, younger students. For example, the Engineering class – Robotics II – has developed a group of students called the Robotics Wizards. The Wizards visit students in the two middle schools and the elementary schools to show off their robots and generate enthusiasm for the program. The 2012 all-girls FTC team that went to the World Championships in 2012 visited younger students and generating more interest in engineering from younger girls.

The FFA Club also works to engage younger students through outreach efforts such as "Ag in the Classroom" a program where FFA upperclassmen visit the elementary schools and present fun lessons about where food and fiber come from. The Club also provides "Touch and See Day" where 3rd graders from across the District visit the high school farm and rotate through 8 workshops put on by the FFA members.

The Club also reaches out to the community through an annual "Farmers Breakfast," which is a free community breakfast which usually serves about 300 before the food runs out. The Club offers tours of the school farm and facilities and the FFA members sit and visit with community members while they eat. This expanded outreach work combined with the new machines and processes will increase the number of students who begin exploring STEM classes before they start high school.

#### **D. DIPLOMA CONNECTIONS**

All of the classes offered through the Engineering and Welding Programs of Study are designed to meet the state and school district diploma requirements. In addition to serving as specific diploma requirements, the engineering and welding classes also offer targeted lessons in the core academic work. For example, 20 minutes of each Welding class focuses on math. This work serves students particularly

well as it introduces math concepts through a practical application that also informs their projects in class. Similarly, in Advanced Engineering students are required to provide a written portfolio describing their work, their process, and their final project. Because the engineering teacher is not an endorsed English teacher, the program works with the English department to read and review the student portfolios to ensure that they meet writing requirements. Further, Engineering students are also required to pass computer programming skill tests including, functions, variables, Boolean logic and basic computer programming skills such as loops, and conditional statements. These skills are nested in the Oregon math skill set.

As described elsewhere in this proposal, this project will increase the number of the career-related learning opportunities – internships, job shadow, and in-classroom projects – that support Essential Skills. The project will also provide more opportunities for professionals in the community to work with students through the additional classes and after-school programming. The equipment upgrades will make it easier for professionals in the community to visit the school and share their expertise as they will be using virtually the same software and machinery that they use at work.

The CTE program at HRVHS works to provide students as much personal educational experience as possible. We believe that the more a student can relate their academic learning to their own interests, the more successful those students will be in both school and life after high school. Therefore, HRVHS offers a number of opportunities for students to meet their Extended Application (EA) requirement through related classwork. For example, the State FFA degree that students earn through classwork and work in the CTSO meets HRVHS' EA requirement. Similarly, after the

implementation of this project and the utilization of the professional level software and machinery, the EA committee will begin considering the robotics and the electric car projects as sufficient to meet the EA requirements as well.

## **E. SUSTAINABILITY AND COMMUNICATION**

We are developing relationships with local businesses and expanding our relationship with CGCC to better understand their goals and needs. We are designing our programs to better meet the needs of these different community groups.

One of the benefits of a smaller community is the access we have to local media, including newspaper, radio, and in-school communications. The CTE program will utilize all of these avenues to affirm the work of our students; recognize the support of our business partners; and celebrate the successes of individual students, such as Josh who is described above. Specifically, we will provide monthly articles to the local newspaper, which will include articles written by students, teachers or business leaders and the college. We will also arrange on-radio interviews with the local radio station, KHR, every other month. This information will also be provided to the School District for its monthly newsletter (hard-copy and electronic) that is sent to parents, teachers, and community members.

Further, we will also utilize social media in the form of Facebook, Twitter, and Instagram. We will encourage students to post their own successes on their individual accounts and link those comments to other relevant pages including the High School Facebook page, different clubs pages, community groups pages such as the Hood River Education Foundation, as well as the business partners and college pages. It

should be noted that our new Superintendent, Dan Goldman, and several teachers in the District are avid Twitter users and link their posts to the HRCSD website.

One of the key components of sustainability of a program like this one is education of the broader community, i.e., potential supporters. This community is very supportive of its schools, and we are confident that the more we can tout our successes, the more local supporters (financial, volunteer, materials) we will gain. Further, given that the bulk of the costs associated with this project are one-time capital costs, the ongoing expenses will include ongoing maintenance of the machinery, professional development and supplies (particularly for welding). The School District will cover the costs of ongoing maintenance and supplies through existing classroom budgets, wherever possible. We will continue to build relationships with local businesses and supporters to ensure that we have the necessary supplies, i.e., welding tips, printer wire, etc. for our students. We are confident that we will be able to maintain this program through District funds and community partners.

#### **F. ACTIVITIES AND TIMELINE**

Given the timing of the grant awards, assuming HRVHS is selected, students will begin to experience the bulk of the impact of this project starting in the Fall of 2014. However, in order to make that possible, the CTE teachers and the District staff will begin working to implement this project immediately after a grant award is announced. First, the CTE team will launch our communication efforts described above. We will make sure that *everyone* knows about this project! This communication will continue throughout the life of this project and the life of the CTE program. Second, we will contact our community business partners individually to begin coordinating the internships and job shadow projects for the Fall of 2014.



Third, the CTE and District staff will order the equipment outlined in this proposal. Given that we have quotes for each of the significant elements needed, we will be placing orders as soon as possible after the award. The computers and software will be relatively simple to obtain and begin using. They will be in place and software installed within a month of the award. The CNC machinery will take more time and should be received and installed within three months of the award. The welding equipment will require more time to install as we will need to remove the existing welding stations, and modify the shop space. This work will be completed in summer 2014 with the stations becoming fully operational for the start of the 2014-15 school year.

Fourth, while the machinery and other equipment are being installed, the teachers and District staff will work to review the coursework for existing classes and any potential new classes in either program of study. This work will include working with other teachers in the high school, business partners, and the community colleges (CGCC, and Blue Mountain) to ensure that the coursework will achieve as many goals as possible for the students. The goal will be to support as many students as who wish to move into the workplace and who wish to pursue more education in CTE after graduation. Both the Welding and Engineering staff will design their respective classes and present them to the HRVHS Site Council for review and approval. The Site Council, which consists of teachers, administrators, parents, and students, meets each Spring to consider all potential new classes at HRVHS. The Council meets and decides on classes in mid-Spring so classes can be prepared and offered for registration materials in late spring. However, because new classes often require staffing changes,

those staff issues will be considered after a grant is awarded – if it is awarded – and in light of broader budgeting and staffing issues at the High School.

Finally, the three remaining outcomes from Section A – increased academic rigor, increased career opportunities, CTSO participation, and improved ability to meet workforce needs in the region – will all occur after the installation of the equipment. While the evaluation plan is described in more detail below, the first assessments of student achievement using the new equipment will begin in the 2014-15 school year.

## **G. EVALUATION**

HRVHS will evaluate the success of this project in two ways. First, it will measure the **outputs**, 1) the number of computers, software, and machines that we actually purchase and install; 2) the number of classes and after-school programs that are available to students; 3) the number of students who participate in the classes, programs, internships, and job shadows; 4) the number of community partners develop; and, 5) the response from participants and partners throughout the project.

Second, we will measure the **outcomes** of the project (the ‘what has changed’ as a result of the project) with successful outcomes being defined as 1) more access for students – especially underserved segments of our student population; 2) increased academic rigor for every student who participates; 3) increased ability to meet the workforce needs in our community.

The increased rigor for students will be measured by the classroom assessments for each CTE class. Each class that is offered is designed to meet the State and District Diploma requirements and the assessments for the existing classes are described in the Programs of Study. As stated above, the first assessments of student achievement in

the new classes and using the equipment will begin with the first quarter of the 2014-15 school year and continue through the school year.

The ability of this project to further meet the workforce needs in the community will take longer to assess. We expect an immediate increase in students receiving their welding certificate and entering work after graduation, starting after the 2014-15 school year and continuing every year after that. We also expect the number of students who participate in internships and job shadow activities to increase significantly in the 2014-15 school year, which will begin to impact the local workforce in the next 1-3 years.

However, we do don't expect the deepest impacts on the workforce to occur for three years or more when more students have been through the new revitalized Engineering and Welding programs of study. Once the group of students start with the revitalize program in the 2014-15 school year, they will have three years of working on professional level software and machinery which will increase their post high school options considerably. We expect that by the class of 2017 more students will be pursuing careers and/or more education in these CTE programs. All of these outputs and outcomes will be tracked by School District staff at regular intervals and provided to our community partners and the Department of Education.

One significant change that these outcomes will bring is the long-term sustainability of this project. The more that local businesses see the impact and value of this program in their own businesses, the more they will support the CTE program.

## **PARTNERSHIPS**

Partners are the key to both this project and the overall CTE program at HRVHS. Over the past several years, the HRVHS CTE program has developed relationships with local

businesses, individuals, and community colleges. The CTE teachers created a Local Business Advisory Committee, which has yielded a tremendous amount of support through volunteer time, financial resources, and work/study opportunities for students.

These partners have also helped define both the content and the scope of this proposal. For example, a manager at Hogg & Davis, a local business that works with the welding department, specifically told us that he needs employees who can “actually weld things.” This was, in part, the impetus for the proposed welding certification program that the welding teachers are developing. In another example, the Engineering teacher met with the manager at Prigel Machines to discuss what the best CNC machine would be for the high school. His recommendation is included in this proposal.

The business partners are also critical to implementing this project. As evidenced by their letters of support, several partners have committed to providing volunteer time, mentors, as well as cash donations to the project. Perhaps the most significant contribution from a number of existing partners, however, is their commitment to provide internships and job shadows for CTE students. These opportunities are the key to truly providing students the experience they need to excel in both the classroom and workplace. One innovative element of this proposal is the idea of community projects. In the past, the CTE program has worked with local businesses and the City and County to develop ‘real-life’ community projects including, a robotic orchard sprayer, a crack detector for the Hood River Interstate Bridge, and welded handrails.

HRVHS fully intends to maintain these partnerships well past the end of this particular grant. This project is simply the vehicle for taking both the welding and the engineering program to the next level of education and career training for our students.

We will continue to work with business partners and the community college to increase the opportunities for our students as well as increase our students' abilities to meet the needs of our local workforce. We can only successfully maintain this program and achieve these goals through strong business and academic partnerships.

## **Conclusion**

Finally, as we move through the 2013-14 school year, the Hood River School District is in a position that most Districts never encounter. The past few years have been difficult and somewhat contentious with budget cuts and other issues creating divisions in the District. Moving forward, however, we have a new Superintendent (Dan Goldman), a new Finance Director, a new Curriculum Director, a new High School Principal, and a Human Resources Director who is beginning his second year in the position. While these staff may be new to our District, they bring a wealth of experience and energy to their positions. Combining their experience, new energy and ideas with teachers with more than 25 years of combined experience, who understand the ability of students and the needs and interests of our local workforce, and HRVHS is in an excellent position to maximize the potential of this CTE grant.

With this grant we are confident that we can develop more students like Josh – students who become more interested in school, learn a skill, and want to further pursue that skill either in the workplace or in higher education.

### **Part 3 - Purpose and Scope of Project**

Hood River Valley High School (HRVHS) is working to bring its CTE programs of study in Engineering and Agriculture Science-Welding into the 21<sup>st</sup> Century. Some of the equipment in our shop dates back to World War II; the router has a date stamp of 1942 on it. With this grant, HRVHS will purchase new computers and software; new fabrication equipment (3-D printer, CNC machine, and welding stations); we will train teachers/staff; and strengthen relationships with business and post-secondary partners. By enhancing these programs of study, we will define a pathway for more students and provide them with the skills they need to succeed in higher education and meet the needs of local technology, agriculture, manufacturing, and computer science industries.

First, revitalizing the shop equipment will enable students to gain experience on the very types of machines that our local industries use everyday. Second, training teachers in these new programs and machines will maximize the opportunities for students to learn state-of-the-art manufacturing from concept to design to fabrication. Third, HRVHS will strengthen its partnerships with local business and the Community College to provide more work/study opportunities, work on real-life projects, skills, college credits and job opportunities for students.

Hood River County School District is seeking a grant in the amount of \$442,141.00 to revitalize its CTE program. These new computers, new software and new CNC machinery combined with better trained teachers, more community partners, and more experience-based learning opportunities will enable more Hood River students to pursue these CTE programs of study into the community college or into high-wage, high-demand jobs in the community.

**How does this project demonstrate innovation in the delivery of CTE? (10 points)**

Hood River Valley High School is taking an innovative approach to revitalizing its CTE programs by trying to align our students' classroom experience as closely as possible with the real-life needs of our local employers and community college. In short, we are working to bring the workplace into the classroom through equipment upgrades and authentic projects and by introducing more students to the workplace through an expanded internship program. Our "local" businesses are unique; they include Google, Boeing/Insitu (world leader in unmanned drones), and a host of other high-tech firms. The Gorge is also historically agricultural and home to thousands of acres of orchards.

Through this project, HRVHS will upgrade its computers, software, and fabricating machines (3-D printer; CNC Machine, CNC Router, welders) to provide more students the chance to learn on virtually the same equipment that local businesses use to design and build the products they sell around the world. Currently, HRVHS has one computer with SolidWorks, one 3-D printer, and 10 out-dated welders. Through this grant, HRVHS will obtain a set of 30 laptops with SolidWorks, two more higher quality 3-D printers, a state-of-the-art CNC machine, and 16 new welding stations that can each perform the 4 basic welding processes. These upgrades will significantly improve the status quo by enabling HRVHS' CTE program to serve more students and provide those students more opportunities to learn the skills and coursework they need to pursue careers or higher education in CTE.

For example, with the new machines, welding students can be certified in the different welding processes that are required to work in any number of manufacturing/building-related industries. As a result, HRVHS will become one of the very few high school programs in Oregon to offer this level of certification to its students.

### **Integration of required and bonus elements into a coherent project**

With the proposed increase in the quality and quantity of CTE equipment, the revitalized CTE program will enable HRVHS to offer a coherent project that will not only help students succeed academically in school, but which is also teach them the skills they need to support the local workforce or pursue higher education after high school. The project will build on the expanded and enhance classroom activities and workplace connections as it includes CTSO's, the middle schools, and after-school programs. For example, the student **FFA Club's** 100+ members will be able to utilize more current 3-D software and state-of-the-art welders, which will increase membership, increase student skill sets, and prepare students to better meet local workforce needs.

HRVHS CTE staff will work with the STEM teachers at **Hood River's two middle schools**, Hood River and Wyeast to incorporate elements of the Engineering curriculum in the lower grades. This curriculum incorporation will help create a more seamless transition for students from middle school to high school in these programs.

This CTE revitalization project will also provide more learning time for students and more opportunity for local businesses to participate in the program through increase **after-school programming**. HRVHS will now offer 3 days per week for both robotics and welding. With more, better equipment, more students can work after school.

This CTE expansion project will also **change the regional landscape** by developing a state-of-the-art program and 'lab' in engineering and welding. This project will, eventually, dramatically increase the number of students who pursue CTE both in high school and after graduation. **STEM is a focus throughout this project** as it emphasizes science, increases available technology, expands student understanding of engineering, and enhances student math skills through design, creation, and fabrication.



## **How does project support CTE expansion growth in your district, region or state?**

Hood River's economy is based in three primary industries – agriculture, technology, and tourism. Agriculture has been the economic driver for almost 100 years. That will not change. Over the past 8-10 years, however, Hood River and the Gorge have become a mecca for technology-based firms some of which produce the most sophisticated aeronautical equipment in the world. Our “local” businesses, e.g., Google, Boeing/Insitu, and others are in reality global businesses. Additionally, the Columbia Gorge Community College, which has campuses in Hood River and The Dalles, has developed the first Renewable Energy Technology program in the country.

The overall goal of this project is to enhance and expand HRVHS' CTE program to become a true ‘feeder’ program for the expanding technology industry as well as the traditional agriculture industry. Through this project, HRVHS will double its business partnerships from 12 to 25 through the grant period, develop more courses that are aligned with the Community College's curriculum, offer more internships and job shadow opportunities – increase from 4 to 20 in the coming year. This project will solidify the CTE program at the high school and in the business community, thus ensuring that as more students graduate with more technical skills, the businesses will have a practical incentive to support and sustain the program after the grant period.

Once this project is implemented, it will serve as a model for other high schools around the state. We will open our doors and invite other teachers and principals to visit the school, talk with our business partners, and learn from the College about how to develop a program that meets students' needs and goals in high school, while providing the skills they need to excel in either the workplace or college after graduation.

### **How does project ensure students receive experiential learning opportunities?**

The HRVHS CTE program has existing partnerships with local businesses, which have already provide some experiential learning opportunities for students both in the workplace and in the classroom.

In the workplace these opportunities involve Summer Internships; School-day Internships whereby students go to a business in place of a regular class period; and Job Shadows that place students in a business for a portion of a day. Last year, four engineering students and five welding students had internships with local businesses and participation in the Job Shadow program ranged from eight students at EIL Engineers to 140 at Cloud Cap Engineering. Through this project expansion, 20 more students in each program will participate in an internship and or job shadow.

The CTE program also brings experiential learning into the classroom. First, with this grant, students will be utilizing virtually the exact same software and machinery that professionals use in the engineering firms and in manufacturing jobs. Last year, CTE students worked on several 'real-life' projects including a robotic orchard sprayer and a safety device (crack detector) for the Hood River Interstate Bridge across the Columbia River. Similarly, the welding program has built handrails, bike racks, and artwork for the City of Hood River and local businesses. More, better equipment will increase our capacity to work on these types of projects in the classroom and in the community.

Additionally, the welding department currently provides a welding certification program for community members through the Community College. With new equipment, every student who completes the welding program of study will have the chance to receive this certification that every employer requires. Thus, students will graduate from high school with the precise training they need to get a job as a welder.

**Part 5 - BONUS Sections A. Career and Technical Student Organizations (CTSOs)**

FFA is the largest student club at Hood River Valley High School with more than 100 members every year. A team of FFA students participates in the Regional Skills Competition, which includes a welding component and the HRVHS club has won this competition each of the past six years. These students and this Club are a significant reason why the welding program is part of the CTE program and this revitalization project. With state-of-the-art equipment, updated software, and more after-school time available for students, the Club members will be able to increase their hands-on time on the machines which will increase their academic success and their physical skills. The new equipment will also attract more students to the club. We expect that the club will grow from 100 to 120 students after the first year of this grant.

In this community where agriculture is still the overwhelming economic driver, the FFA club has a tremendous impact on the overall school environment. Where some schools may have a club for a small segment of the population, Hood River's FFA Club represents a significant portion of the broader community and our cultural heritage.

The FFA Club is linked directly to community partners in the agriculture industry. These children are the sons and daughters of farm workers and orchardists. These are businesses that work with and support this CTE program through ideas, information, and projects. The Club offers an annual "Farmers Breakfast," which is a free community breakfast, which usually serves about 300 before the food runs out.

The FFA Club engages younger students through "Ag in the Classroom," where FFA upperclassmen visit the elementary schools and present fun lessons about food and fiber and "Touch and See Day" where 3rd graders from across the District visit the high school farm and rotate through 8 workshops put on by the FFA members.

**B. Middle School Component (7 Points)**

Hood River County School District has two middle schools – Hood River and Wy'east – both of which have STEM programs that will feed the high school CTE program. Hood River Middle is home to one of the very few net-zero school buildings in the country and Wy'east Middle just hired a STEM teacher who started work this fall. Each school also has several very active robotics teams that are coached by teachers.

The high school teachers have a very strong relationship with the middle school teachers and provide as much support for their STEM efforts as possible. Specifically through this project, the Engineering teacher at the high school will work with the middle school teachers to incorporate components of the high school curriculum into the middle school math and science classes. This will provide the middle school students an introduction to the CTE concepts they will encounter in high school.

Additionally, the High School CTE students will reach out to the middle school students through two programs, 1) Robotics Wizards – engineering students visit classrooms in the middle schools and elementary schools to show off their robots after the FIRST LEGO competitions; and 2) Ag in the Classroom – FFA students lead elementary and middle school students in engaging lessons about food and fiber. These outreach efforts generate a tremendous amount of excitement and interest in the lower grades and introduce the younger students to CTE programs at the high school.

Additionally, both middle school STEM programs recently received grants from the Hood River Education Foundation to purchase Vernier equipment to explore applied physics and real world math and science with middle school students. These two grants will expand the opportunities to introduce middle school students to CTE and increase both their understanding and interest before they enter high school.

### **C. Out of School Time Programming (7 points)**

Currently, HRVHS robotics students stay after school one day per week to work on their robots, their classwork, and other projects. Through this project, the Engineering teacher has committed to increase this to three after-school days per week. Mr. Blackman is confident that with the new computers, new software and the new CNC machine and 3-D printers, his students will be very excited to use them after-school.

Additionally, there is no after-school time available for welding students. Therefore, the Welding teacher has also committed to providing after-school time in the classroom and in the shop for his welding students. Similar to the engineering program, the welding teacher, Mr. Schmidt, has no doubt that many students will be excited to utilize the new CAD software and the new welders. Both Mr. Schmidt and Mr. Blackman will use the after-school time to reinforce the work that students are doing in class in order to link the after-school work with the in-class content.

Further, the increased number of computers, CNC machines, and welders that we will purchase through this grant will provide more students with significantly more hands-on time; more time using 3-D software and more time on the new machines. Combining the increased machinery with more time after school to use the new equipment and these students will excel at learning the skills that they need to pursue careers or higher education in engineering.

Finally, the after-school time will also make it easier for volunteers from local businesses who work to visit the school and work with the students. This time will include working on authentic community projects such as the robotic orchard sprayer or welded handrails. Thus, this after-school time for the CTE program will improve student academics, increase student skills, and increase their connections with local employers.

#### **D. Focus on Regional, Statewide or System Changes (7 Points)**

Hood River Valley High School is working to develop a state-of-the-art CTE program in both engineering and welding. This has already expanded beyond the walls at HRVHS and beyond the geographic boundaries of Hood River County. The business partners who have committed to this project are located throughout the Gorge. We will work to take this project to a larger audience in several ways.

First, HRVHS staff will provide as much support as possible to other schools in our region who may be interested in expanding their own CTE programs. We will invite students, teachers, and principals from throughout the region to visit the school and tour the shop.

Second, we will continue to offer welding programs for community members through the Columbia Gorge Community College. With the increased number of welding stations and the higher quality equipment, we expect more community members will seek out these programs.

Third, if this proposal is funded, HRVHS will become one of the very few high schools in the state that has this level of welding equipment and the potential to offer high school students welding certification when they graduate. Given this unique program, HRVHS will also invite different schools from around the state and the northwest to visit and learn about the program.

Fourth, HRVHS will work to share this program and educate people around the region – and around the state where possible about the ongoing success of the project. Specifically, the communication efforts described in the proposal will include outreach to business partners, individuals, other schools, as well as the general community. This outreach will include stories, photos, invitations and other avenues for informing more people in the community about the CTE program. We are convinced that the more people who learn about successful CTE programs, the more those programs can be adopted and adapted to other schools in other regions of the state. One size does not fit every school district, but we at HRVHS are more than happy to share the results of our work so others can build programs that suit their needs.

## BUSINESS, INDUSTRY, LABOR AND POSTSECONDARY EDUCATION PARTNERS

The following individuals and/or organizations have reviewed, discussed, and agreed to their part in implementing the project proposed in this grant application:

	Name	Title	Organization
1.	Charlotte Krayenbuhl	Staffing Manager	Insitu
2.	Hein van Swaay	Owner	Impact, Inc.
3.	Jim Siekkinen	General Manager	UTC Aerospace Systems
4.	Cory Roessler	Manager	Hood Tech Corp Mechanical
5.	Brian Prigel	Owner	Prigel Machine & Fabrication
6.	Andy von Flotow	President	Hood Technology Corp.
7.	Jessica Metta	Executive Director	Gorge Technology Alliance
8.	Tricia Stevens	President	Keenwire
9.	Eric Maher	Financial Advisor	Northwestern Mutual Advisor
10.	John Schlosser	Co-owner	Schlosser Machine
11.	Pat McAllister	Manager	Hood River Supply
12.	Cody Kellogg	Owner	Kellogg Welding, Inc.
13.	Greg Gallagher	Hogg & Davis, Inc.	General Manager

A letter of commitment must be included for each partner listed above. A commitment letter addresses what specific resources (financial, in-kind, materials, expertise, etc.) the partner will contribute to the project. The letter also addresses the commitment of the partner beyond the life of the grant. Commitment letters demonstrate a greater involvement in a project than letters of support