

Washington Integrated Sector Employment



Project Success Stories

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Washington Integrated Sector Employment (WISE)

A U.S. Department of Labor Trade Adjustment Assistance Community College and Career Training (TAACCCT) Round 4 Grant

Project Duration: 10/01/2014 – 9/30/2018 (three and a half years of activity; final six months reporting)

Total Project Value: \$9,994,854

Grant Lead: Centralia College and the Center of Excellence for Clean Energy

The WISE Consortium is a statewide collaboration, led by three Washington State Centers of Excellence in Clean Energy, Construction and Advanced Manufacturing. Washington's Centers of Excellence are community colleges designated by the State Board for Community and Technical Colleges as statewide leaders in specialized workforce education and training for industries that help the state's economy grow.

Through a \$10 million U.S. Department of Labor Trade Adjustment Assistance Community College and Career Training TAACCCT Round 4 grant awarded October 1, 2014, WISE coordinates the efforts of the public workforce system to support sustainable development in our most critical industries. Troy Nutter, Training and Operations Manager, Puget Sound Energy and Chair of the WISE Executive Board, states, "The WISE grant's chief value is in its ability to develop a pipeline of skilled technical workers."

The WISE Consortia includes eight community and technical colleges that offer specialized Certificate and Degree programs focused on the targeted sectors creating a cluster focused on apprenticeship, related skill sets in trades occupations, comparable career pathways, and employer engagement. They include Centralia (CC) (lead), Everett (ECC), Renton (RTC), Bates (BTC), Shoreline (SCC), South Seattle (SSC), Green River (GRCC), and Walla Walla (WWCC) Community Colleges.

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The Washington Integrated Sector Employment (WISE) consortium is proud to share this series of success stories that highlight the WISE project and partnership. This by no means captures the entirety of the project, but rather illustrates the history, perspective and partnership that brought the project to fruition.

These stories serve as examples of the innovative work that was produced by the people who were part of the project. Individually and collectively, these people define the word “consortium” in its greatest sense.

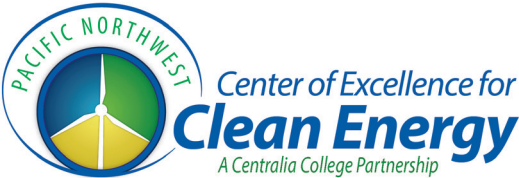
THANK YOU all for your dedication to your students, the WISE project and the partnership as a whole.

Barbara Hins-Turner

For a more detailed report the final grant narrative report, completed grant materials, evaluation report and other WISE documents visit:

- cleanenergyexcellence.org/projects/wise/
- skillscommons.org/handle/taaccct/1532

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WISE Executive Leadership Team



The WISE Executive Leadership Team provides oversight for a nearly \$10 million U.S. Department of Labor TAACCCT Round 4 grant, called Washington Integrated Sector Employment (WISE). Comprised of members from industry (energy, advanced manufacturing and construction industries), organized labor and workforce development, the team provides strategic guidance to the WISE consortium and serves as a resource for partners to ensure grant goals are achieved.



The consortium is comprised of three Washington state Centers of Excellence (Energy, Aerospace & Advanced Manufacturing and Construction) and eight community and technical colleges.

Clean Energy

Troy Nutter, Puget Sound Energy (chair)
Jeremy Gall, Avista Utilities
Bob Guenther, IBEW Local 77
Todd Currier, WSU Energy Program
Alice Massara, Tacoma Power



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Advanced Manufacturing

Steve Kidd, CIMtech
Jesse Cote, 751 Machinists
Bob Uptegraff, Pacific Northwest Aerospace Alliance



Construction

Stephanie Caldwell, Abscher Construction
Moe Salem, McKinstry
Anna Pavlik, City of Seattle
Christina Riley, Northwest Laborers Training Trust



Workforce Development

Dawn Karber, Spokane Area Workforce Development Council
Rachel Roberts, Apprenticeship Track Program Specialist, Washington State Department of Veterans Affairs



Labor Alternates

Kairie Pierce, Washington State Labor Council



City of Seattle

Electrical Construction, Diesel

From Proposal to Implementation

As the WISE project's lead grant writer, Brandon Rogers, Vice President and Executive Dean at Bates Technical College, expressed his surprise at the ease of which the WISE grant's initial proposal became a reality. Previous experience with TAACCCT grants and similar grant programs helped Rogers and the WISE team mitigate the common problems associated with transforming a proposal into practice.

Rogers was confident the consortium's collaborative model, one with the Washington Centers of Excellence at the helm, contributed to the WISE grant's approval and subsequent success. He explained that its' unique, multi-sector approach; numerous letters of commitment and first-source hiring agreements; greater industry engagement; and balanced distribution of resources factored heavily in the Department of Labor's approval of the WISE grant. The Centers of Excellence are well positioned to lead large federal grants. Rogers stated, "By mission, [the Centers of Excellence] are meant to serve the entire system of 34 colleges and...the 10 Center directors...do a fantastic job being good ambassadors for the entire system."



Bates Electrical Program students at work in the lab.

Training and Education Tools

Mike Brandstetter, DOL Grant Manager for Bates Technical College, explained that WISE funding allowed Bates to buy equipment, hire staff, and furnish modern classrooms. Bates invested \$50,000 of WISE money—plus \$12,000 from its own budget—to purchase simulation equipment for their hydraulics program. The previous curriculum fell short of modern standards due to inadequate, out-dated equipment, particularly those specialized tools related to trucks and heavy equipment. With WISE assistance, Bates' instructors built mock-ups around suspensions, transmissions, and engines, facilitating hands-on learning within a contemporary, competitive curriculum.

Bates Technical College, bolstered by WISE, partnered with Daimler AG to adopt cutting-edge courses from their expansive online curriculum. These courses were not simply offered as a substitute, but instead became an option for students who, for whatever reason, were unable to participate in traditional classroom environments. Daimler's accessible online content paved an alternative way for students to remain on-track. Brandstetter remarked that the diesel mechanics program was also able to purchase a number of hand tools, many of which were augmented by donations from the industry.

Money was allocated to expanding and updating both the diesel and electrical construction program's classroom spaces, replacing barebones whiteboards with interactive television screens and other technology



Electrical Construction, Diesel

upgrades. Bates introduced two entirely new courses, both of which integrated top-of-the-line technology specific to modern electrical construction sites, both residential and commercial. Similarly, faculty developed five new courses for the diesel program. Overall, WISE dollars created thirty new credits of coursework; 10 percent of the electrical construction program and 20 percent of the diesel technology program. New faculty members, funded through WISE, brought fresh perspective and energetic initiative to their respective programs.

Outstanding Collaboration

Electrical students at Bates Technical College enjoy a unique opportunity: the Department of Labor and Industry (L&I) applies time spent in college towards the hours required for an electrician's license. Brandstetter believes students choose Bates because of the 4,000 creditable hours; "it's actually a bigger draw than the degree."

Even with the expansive changes facilitated by WISE, Bates Technical College was able to maintain the strict criteria "that made the program excellent in the eyes of L&I," particularly, in part, to their partnership with Habitat for Humanity. Habitat for Humanity allowed Bates' students to use Habitat Houses as learning laboratories, enabling aspiring electricians to gain practical knowledge through hands-on application. Brandstetter explained that, when WISE began, the collaborative partnership between Bates Technical College and Habitat for Humanity was in its infancy. Now healthy and robust, the partnership continues to expand alongside the capacity of the greater educational program.

Successful Navigation

Rogers and Brandstetter both emphasized the value of WISE-funded navigators. The navigators played a key role in providing guidance on career pathways and Bates' programs, tailoring their methods to meet the individual needs of their students. From resume writing to accessible transportation, the navigators connected learners with the necessary resources to personalize technical education. Rogers boasts that "intensive, focused advising, counseling, navigation—whatever you want to call it—can really pay off. The numbers in our program really demonstrate that we had some extraordinary outcomes."

Honoring the commitments outlined in the original grant proposal, Bates Technical College hired IBEST instructors, "supplemental academic instructors that would be imbedded with the program instructors to teach math contextually." Brandstetter clarified that "while they were not WISE-funded, they were an element in the WISE program that the college committed to doing if we were to get the grant." These specialized faculty helped boost student scores on the IBEW Apprenticeship Application from an approximate 20% pass rate to over 70%.

Rogers concluded by saying, "I think we've been very good partners, very responsive partners, and I think that's going to benefit this institution, whatever the next opportunity comes."



Energy Technology - Hydropower Class

James Hovis, Program Manager at the Pacific Northwest Center of Excellence for Clean Energy, takes pride in the benefits afforded by the WISE grant. Centralia College used WISE funds to support three educational programs, including Energy Technology. This program enjoyed an influx of new materials, such as computers, software, and books, but more importantly a new course in Hydroelectricity (PPO 208).

Highlighting Hydroelectricity

Assistant Professor of Energy Technology and Power Operations, Rulon Crawford, has had a long career in the Energy Industry, he worked for Portland General Electric for 30 years. He is a graduate of Eastern Oregon University with a degree in Business Administration and an MBA from Marylhurst University. Rulon has more than 20 years of experience teaching classes on basic electricity and he has taught 1st year energy classes at Centralia College for the last 11 years.

Rulon praised the generous contributions of the WISE grant, particularly in expanding Centralia College's Energy Technology program to include hydroelectricity. The WISE grant allowed Centralia College to refocus the Energy Technology program on one of the most relevant technologies in the region-Hydropower. In the Pacific Northwest, hydropower is the dominate form of electricity generation; and Washington State is the leading hydroelectricity producer in the United States (www.instituteeforenergyresearch.org/states/washington).

Centralia College originally designed the Energy Technology program to cover wide range of topics in the energy industry and prepare students for successful careers in the energy sector. Crawford explained that "[the Center of Excellence for Clean Energy's Advisory Board] came to us and said 'We'd really like to have a little bit more in the hydro side of things for students out here in the Northwest because most of our electricity is coming from hydro.' So, with the WISE grant, we put together...a 10-week course specializing in hydroelectricity."

In the new hydropower course, Centralia's students are first familiarized with the basics of hydropower, dam and turbine designs, electrical grid synchronization, power system operations, relevant regulations, and pressure effects. What follows is a deep dive into the intricacies of dam relicensing. This includes an intimate, expansive exploration of tribal rights, fishing rights and quality, water quality, and recreational land use. Centralia College has a real advantage over other schools due to its close proximity to several major hydropower facilities. Rulon takes full advantage of this by taking students to tour some of these facilities to learn in the field. Students are able to learn about dam features in the classroom then see them in operation. "Every day, every locale is different," Crawford explains, and the new course reflects the ever-changing facets and considerations necessary for operating



Centralia College Energy Program students on a tour at Mayfield dam with Tacoma Power.



Energy students on a tour at Tacoma Power's Cushman Dam.

a hydroelectric dam.

Crawford asserts this three-week section of the course allows "all of our students [to] get a better appreciation for what the rivers are all about."

Making Marketing Materials

For Centralia College, the WISE grant afforded not only a new, modern hydroelectricity course but also the funds necessary to promote it. Hovis explained that WISE allowed Centralia College to finance promotional advertisements, including local radio broadcasts and video plugs on YouTube and Facebook.

Hovis further emphasized the generous contributions of Tacoma Power in creating Centralia's new marketing materials. Tacoma Power's robust public outreach arm supplied Centralia College with high-quality drone-captured dam footage, free of charge; Tacoma Power's Generation Manager, now retired Pat McCarty, acted as the videos' voiceover (<https://www.youtube.com/watch?v=5glgiJ99UbI>). Hovis boasted that "the creation of that video...didn't cost us anything because of donated time and donated video footage."

Better Together

Both Crawford and Hovis extolled the many collective and individual contributions of the Center of Excellence for Clean Energy Advisory Board member companies and associated utility groups. This robust crew included 9 in-person experts and 16 remote contributors, including representatives from Tacoma Power, IBEW 77, Lewis County PUD, Centralia City Light, Seattle City Light, Avista and Puget Sound Energy. Rulon incorporated the team's expertise into a relevant, insightful course.

Hovis emphasizes that the WISE grant facilitated an extensive "Developing a Curriculum" (DACUM) process that involved subject matter experts from the Pacific Northwest and Canada (<http://cleanenergyexcellence.org/wp-content/uploads/2016/07/Centralia-Hydro-DACUM-Report.pdf>). Using the DACUM process, these individuals worked to answer two core questions: "What is the typical work profile of an entry level worker at a Northwest hydropower plant?" and "What are the core knowledge, skills and aptitudes (KSAs) a person needs to do this work?" The experts devoted an entire day to identifying important industry topics and translating their experience and expertise into relevant course material. The resulting course captured career learning from subject matter experts, successfully passing crucial knowledge from experienced workers into the future.

The benefits of the WISE grant's specific contribution to Centralia College extend well beyond Washington's borders: Centralia's incredible hydroelectric program is available on SkillsCommons (<https://www.skillscommons.org/handle/taaccct/15096>), free for public use. All of Centralia's advertising materials; grant writing templates; policies and procedures; and education programs now exist in SkillsCommons' free and open online library. Hovis declared, "If other colleges want to create a hydro course, they can pull [everything] down and use it."

Industry Partnership

Troy Nutter commands an impressive resume: currently serving as the WISE Consortium Executive Committee Chair and the Center of Excellence for Clean Energy Advisory Board Chair in addition to his role as Operational Training Manager at Puget Sound Energy. Having begun his professional career as a paramedic, Nutter eventually pursued a path as an electrician and millwright, earning three journeyman cards. Nutter has contributed to several strategic workforce taskforces alongside the U.S. Department of Labor and U.S. Department of Energy, the Distribution Contractors Association, and the American Gas Association. He is currently working on a national pilot for an operator qualification integrity program.



WISE, Education, and Industry

Nutter believes the WISE grant directly benefitted the greater labor industry by creating relevant, modern curricula and programs that ensure “the emerging workforce [comes] out with a basic understanding of...skills that are current and relevant instead of using out-of-date material or practices that are not on the leading edge.” Careful consideration of modern technology and emerging trends allowed Nutter and the WISE team to advise educators on how best to revise their industry programs. Similarly, tracking student success and failure built a repertoire of custom feedback, ensuring consortium colleges

know exactly where to focus when seeking ways to ensure students’ success. “The key is having that exchange of information.”



Lower Baker Dam, Concrete, WA
Puget Sound Energy

Benefits of Center Involvement

WISE’s relationship with the Centers of Excellence, in Nutter’s opinion, ensured the grant’s overall success. The Centers of Excellence Advisory Boards, are comprised of industry and labor leaders that helped focus the grant on “the direction the industry [needed] to go” by addressing specific industry requirements. Nutter explained that this strategic, needs-driven approach ensured “a successful outcome because you’re able to have results that matter to people that are participants in the grant while addressing the needs of the industry sector that you’re representing.”

Troy Nutter, the importance of Center involvement translates to program longevity and sustainability. As an enduring and unbiased partner, the Centers advised the associated WISE colleges on matters ranging from curriculum and coursework restructuring to financial reporting, focusing on the fair distribution of benefits while maximizing continued relevance. Barbara Hins-Turner, Director at the Pacific Northwest Center of Excellence for Clean Energy, adds that the Centers’ solid relationship with consortium colleges ensured WISE-created jobs and programs didn’t simply disappear once the grant was complete. The Centers’ budgeting and fiscal

support continues beyond the life of the grant. Industry involvement built the WISE proposal's foundation and created, in Nutter's words, a solid "support system" for the grant as WISE ideas became reality.

Additionally, with Center involvement, WISE's grant materials are accessible no matter the time, funding, or other unforeseen issues that may arise; due to their sustained funding by the Washington State Legislature, the Centers guarantee WISE-created content remains easily available on both the Center websites and Skills Commons. This, Nutter states, is the key to responsible grant spending, ensuring "it's still accessible, it's sustainable, and it's building more towards the future."

The WISE Advisory board is comprised of representatives from the Clean Energy, Advanced Manufacturing, and Construction industries. The board's members include: Jeremy Gall (Avista Utilities), Bob Guenther (IBEW Local 77), Todd Currier (WSU Energy Program), Alice Massara (Tacoma Power), Steve Kidd (CIMtech), Jesse Cote (751 Machinists), Bob Uptegraff (Global Aero Ventures), Stephanie Caldwell (Abscher Construction), Moe Salem (McKinstry), Anna Pavlik (City of Seattle), and Christina Riley (Northwest Laborers Training Trust).

Getting Involved

For those looking to enter the workforce development field, Nutter suggests networking with like-minded individuals: "the time that you actually spend doing this kind of work and networking with folks will come back to you tenfold." Comparing and sharing ideas leads to new perspectives that, in turn, have inspired innovative solutions across the board. "I get as much from the meetings in the networking piece. I'm just having conversations with my peers...[and] they're gaining 10 different perspectives on the same issue. It really gives them a well-rounded-view--a holistic view--of the industry. I'm gaining knowledge because I'm finding out how other people have addressed things and they're gaining because they're tracking across the organizations what the trend is. So I think that is the value anytime you bring peer networks together."



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Combined Machinist Certificate Program

Two Colleges: One Manufacturing Goal

An Innovative Model for a Combined Machinist Certificate Program

A Novel Idea for Collaboration Gains Acceptance

As Director of Employer Engagement for Shoreline Community College, Lauren Hadley, MA Ed., discussed a groundbreaking collaboration with South Seattle College's Mary Lockman, representing its StartNextQuarter.org program. Launched in 2016, the same CNC (Computer Numerical Controlled) Machinist Training Program was offered by these two otherwise unaffiliated schools at both campus locations 16 miles apart. The joint program consisted of three 20-credit courses: Basic Manufacturing, Intermediate Manufacturing and Manufacturing Technology Applications, supplemented by mathematics teaching.



South Seattle machinist student in the workshop.

Lauren explained that the idea for this unique collaboration was hatched when the person from West Seattle running Shoreline's manufacturing training program faced a soul-crushing daily commute and realized that South Seattle's Georgetown Campus, which hosted the Aerospace Joint Apprenticeship Committee already had the beginnings of a CNC Lab, and was much more centrally located. So the idea was to launch a satellite program there on weekends when the equipment was idle and available, following the same curriculum. For two quarters of the year, Shoreline would collect the Full Time Equivalency (FTE) staff cost and South would collect it the other two quarters.

Mary noted that plenty of South Seattle students wanted access to the quality manufacturing education at Shoreline "without having to make that really hard commute" to the suburbs between Seattle and Everett. "By offering it on the weekends, we were able to attract students who were currently employed and need to upgrade their skills." The State Board for Community and Technical Colleges told them it was a 'first' in the history of community colleges to have students seated in the same classroom all year, but actually 'attending' 2 different institutions.

Due to logistical challenges, the joint program has been discontinued, but the same curriculum is now alive and well at both South Seattle and Shoreline. So effectively, Shoreline's very successful CNC training program was replicated to reach far more interested students across a broader geographic region.



South Seattle machinist student in the workshop.

Benefits for Students

During the joint program, the two colleges cooperated to get students registered at whatever campus was 'taking their turn at that time' according to Mary. Lauren added "about 75-80 percent of the students in the classroom qualified for some sort of tuition support through Federal Opportunity Grants, Worker Retraining or Workforce Funding."

Mary and Lauren described the positive impacts of this collaboration on the students like this: 1) quality training for the manufacturing careers they are pursuing: 'get a job, keep a job, get a better job,' 2) more conveniently located training for CNC machining, and 3) the ability to get advanced training in the evenings and on weekends

Combined Machinist Certificate Program

while keeping a full time job.

The program has an I-Best (integrated basic education) math component, instead of a language learner module (ESL level 4 is a prerequisite, but a HS diploma is not, though one is required by other schools such as Lake Washington [Technical College]). Mary explained how adult learners come in who haven't had instruction in solving math problems "in ages" and they need that to get a high quality job.

Through I-Best, students start with basic addition and subtraction and after completing 3 quarters are comfortable in applied math trigonometry. Lauren called this a 'huge progression' made possible by "going out into the shop...utilizing math to calculate" the part of a job they

are responsible for. And for students on track to earn a degree, that math component counts toward their two-year Associate of Applied Sciences degree.

Benefits for the Colleges

Mary explained that while substantial effort was required to get the funding worked out, "the reward was...a beautifully pulled together CNC program" fully ready to go live with the right faculty in place. No students were "Guinea pigs" because the curriculum was already "tweaked to perfection."

The collaboration

drastically cut lead-time for a 'jumpstart' on "something that

would have taken [South Seattle] quite a long time for us to pull together on our own." And then, she said, we would have been seen as a competitor. But as it turned out, "Shoreline was grateful that we were picking up students that they...were not able to reach because of the I-5 corridor."

"Ideally, it's what should happen anytime a community college starts up a brand new program, you know, to have that incredible support and advice and encouragement from [another] college that has done this gig [before], Mary observed about the development of the program. "It helped us figure out equipment, materials, supplies." Shoreline has a full machine shop (12 CNC machines). When the program started, South Seattle College had only one, and now they have three at their Georgetown campus in the heart of Seattle's industrial area.

More recently Shoreline has found a way to collaborate again with North Seattle College, so this may be a new collaborative model, as Lauren described it, leveraging the relative strengths of different colleges instead of using the old "siloes or possessive approach." "Nobody has to create anything new and we're both doing what we do best." Mary noted that when her school agreed



South Seattle College's Georgetown Campus.

Combined Machinist Certificate Program



to be Shoreline's "south site"... in exchange, we got the launch of a new program and how to recruit for it," leveraging Shoreline's established reputation in the field.

Navigating Funding Challenges

Mary discussed the reasons she actually wished for more "heavy handedness" from the Washington State Board in terms of operating all of its student funding programs more strictly and consistently "in the same way." For example the South Seattle Opportunity Grant supervisor had a very different idea about who they could fund than they did at Shoreline. Whereas

South had a one year certificate program, that could serve as the first year of Shoreline's two-year degree program, students would need to transfer to complete that degree. Lauren agreed, and emphasized that if funders would continue to fund a student at South because of their "opportunity to get that two-year degree by transferring to Shoreline," that would help the case for picking the collaboration back up again.

Confusion also arose around conflicting ideas on satisfaction of local residency requirements for tuition assistance eligibility. Trying to get the colleges' registrars "on the same page" posed a challenge in this regard.

In terms of how the WISE funding facilitated this partnership, Lauren explained that a position called 'teaching technician' was created at Shoreline because classes are taught in clusters with three levels of students in the same classroom, juggling between lectures and lab work, plus the I-Best component. WISE was able to pick up the costs for that additional dedicated staff position. That eliminated awkward 'us vs. them' transfer billing for that faculty member between the colleges, because "we're a consortium" and all under the same "umbrella of WISE." Mary noted that for the first couple of quarters, WISE also funded her position as program administrator.

Overall Reflections

Lauren observed "In it's heyday, we were running five sections of CNC training between two colleges." The "unique thing about these partnerships is...that the players we were choosing to collaborate with are people that have worked together in the past." For example, she had worked with the Workforce Dean at Georgetown before, and after moving on in their careers, they reconnected to collaborate. Likewise Shoreline's financial aid person had worked at North, so that facilitated a relationship there built on the trust of an existing professional relationship.

Mary suggested, "We just needed to be slaves to the faculty, because we could trust completely what they were doing. They came in prepared, experienced." She later added that they are "really familiar with the kinds of students" we attract.

Mary concluded the discussion by saying what made this collaboration unique was the fact that participants all leveraged their working relationships with colleagues in the local area. It was a 'bottoms-up' grassroots initiative that Mary believes succeeded largely for that reason, whereas a top-down approach "might have been a little hairier" or more forced and stressful. She explained, "and its only when we went to the State Board and they say 'you realize no one's ever done this before really?' Well that was the confidence booster" that made us want to 'go for it' anyway.



Energy Systems Technology

Jason Selwitz Ph.D., Faculty Lead for the Energy Systems Technology Program, oversees an amazing new collection of degree programs at Walla Walla Community College (WWCC). This new program is one the WWCC programs that received support under the Washington Integrated Sector Employment (WISE) Grant. The WISE grant laid the groundwork for the efforts to re-organize these degrees. Under WISE, WWCC developed Career and Educational Navigator positions to provide recently dislocated and unemployed workers and/or Veterans with assistance on a range of existing state and federal support programs that are often difficult for students to access without timely and clear guidance and assistance. As a result of the empathetic yet aggressive academic counseling performed by the navigators to benefit EST students, attrition rates dropped while completion and job placement rates rose. WISE grant funding also supported instructor training to spur further professional development and the purchase of more than \$300,000 worth of technical teaching aids and equipment used in the shop to enhance delivery of EST course content.



A Guided Pathway: WWCC's Energy Systems Technology degree program

At the onset of the 2017 to 2018 academic year, Walla Walla Community College (WWCC) re-engineered its Energy Systems Technology (EST) Department to feature just one Associate of Applied Science (AAS) degree program. In the past, WWCC had separate degrees in Refrigeration, Electrical, Wind Technology, Plant Operations, Industrial Maintenance, Precision Agriculture, and Irrigation. A common denominator for employers in the Pacific Northwest is the demand for technicians and operators who maintain robust electrical, mechanical, and bio-chemical skills and are interested in lifelong learning. WWCC integrated the identified degree tracks into one degree program to: a) act on feedback from advisory boards and industry partners; b) provide students more effective academic advising; c) improve the coordination and efficient delivery of vital financial and social support services; d) reinforce the quality of courses and program offerings; e) integrate recommendations from research and practice on stacked and latticed credentials; f) strengthen job security for instructors; and g) reduce and/or eliminate orphaned courses serving single degree tracks.

The Electrical Core

In the revised configuration, EST students now complete an electrical core certificate of 52.4 credits in year one. This "year one" core, i.e. a certificate in electrical systems, is a pre-requisite for a range of "year two" certificates.

As visualized, when a student completes the core electrical certificate, followed by completion of the course requirements for one or more "year two" certificates, the student completes an AAS degree in Energy Systems Technology with concentration in one or more specified training areas.

EST's Electrical Systems core certificate: 52.4 credits		
Q1:	EST 145 EST 131 AMATH 107 (M) EST 260	Industrial Safety/Material Handling Electrical Theory Applied Mathematics National Electrical Code
Q2:	EST 132 AENG 100 (W+J) ENT 112 Elective	Electrical Applications Applied Writing Blueprint Reading TBD per concentration
Q3:	EST 133 EST 150 IFA 022 ACOM 102 (O/R/L) Elective	Electrical Controls Motors/Motor Maintenance Industrial First Aid Applied Communications TBD per concentration



Energy Systems Technology

Multiple Degree Concentrations

Through training within the following degree concentrations, graduates of the EST degree program are in high demand by municipal public works, power generation utilities, food and beverage processors, pulp and paper mills, farms and ranches, irrigation service providers, renewable energy facilities, and manufacturers of advanced products:

1. Mechanical Electrical
2. Plant Operations
3. Renewable Energy
4. Industrial Mechanics
5. Facilities Energy Management
6. Cellar Maintenance
7. Center Pivot Irrigation
8. Precision Agriculture



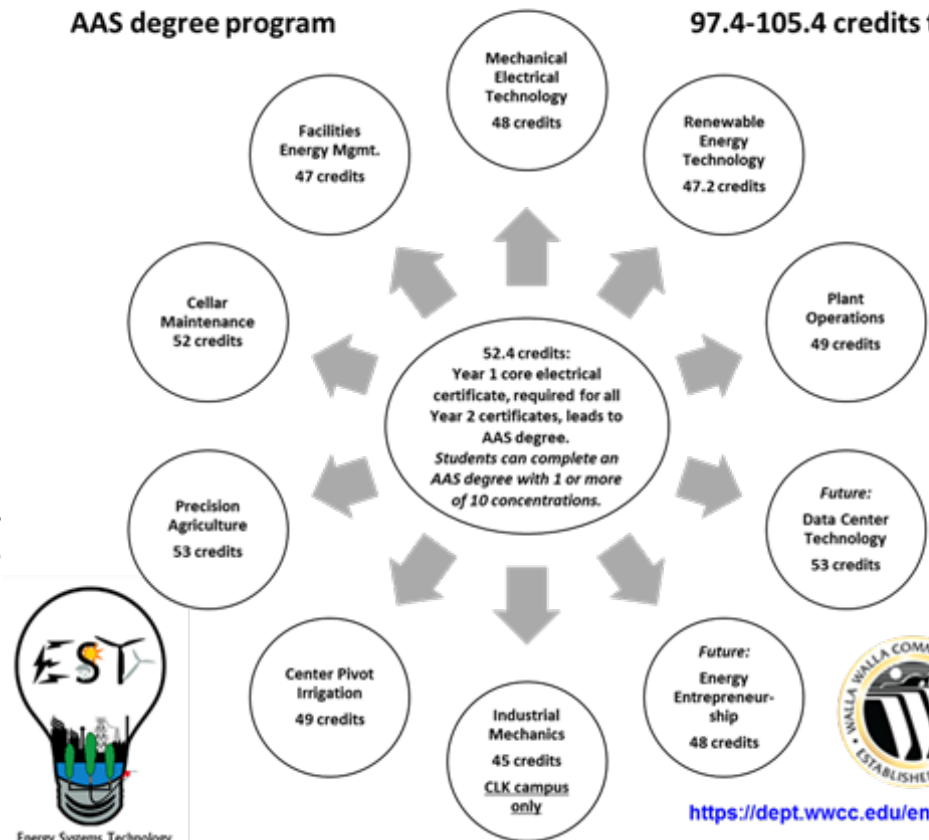
Energy Systems Technology

EST students gain hands-on practice monitoring, adjusting, and controlling equipment, such as: turbines, pumps, valves, gates, fans, controllers, filters, conveyors, emitters, drones, robots, and instruments -- to ensure optimal performance of energy systems. Students build the skills and knowledge to begin troubleshooting, diagnosing, and repairing or replacing electrical and mechanical equipment safely using appropriate testing devices and power tools. Graduates enter the workforce having gained experience and possess the tools to calculate, measure, and process a variety of materials to generate high value products, including: electricity, bioproducts, treated water, crops, foods and beverages, paper products, and renewable energy.

WWCC's Energy Systems Technology guided pathway

AAS degree program

97.4-105.4 credits total



Energy Systems Technology



<https://dept.wwcc.edu/energy>

Stacked and Latticed Credentials

A stacked set of credentials occurs when multiple certificates are sequenced together to build a students' formal record of acquired skills and knowledge. For example, the EST "year one"

Energy Systems Technology

electrical certificate is the core of all "year two" concentrations leading to the EST degree. In this model, students can complete (or stack) one or more "year two" certificates/concentrations on to this first year electrical core. There is a spectrum of overlap between each concentration's requirements. EST students can complete one or two short certificates as an entry point to the first year electrical core certificate and/or even as a starting point to fulfill a portion of their degree concentration requirements.

Latticed credentials occur when two or more degree programs join forces to utilize their respective courses to form a new credential. Examples include:

- Coupling a set of required courses from the established plant and soil science degree with those from geographic information systems and EST to form the precision agriculture concentration;
 - Tying together water technology and management and agriculture courses with EST courses to form the center pivot irrigation concentration;
 - Incorporating a series of three precision machining courses within the EST concentration in industrial mechanics leading to an additional machining/millwright endorsement; and
 - Embedding new short certificates in entrepreneurship and data center technology from the business and computer science departments into planned concentrations for the EST degree.
- These credentials cut across multiple disciplines and provide students marketable skills outside of their home base degree or department. These "latticed" credentials make it easier for students to earn multiple formal endorsements, certifications, and/or degrees in often seemingly unaligned disciplines. As students complete courses for the EST concentrations listed, they are completing requirements for a secondary certificate or degree program in addition to their primary credential of focus.



Workers at a wind farm.

Photo courtesy of Puget Sound Energy



Walla Walla students on a field trip at ZeaChem in Boardman, Oregon

As WWCC leverages state and federal support to better assist students and strengthen its programs, Energy Systems Technology students will become empowered to avail of high value training. Graduates will earn multi-faceted credentials in newly aligned content areas and secure relevant and rewarding employment in the Northwest.