

<b>Short Title</b>	SCADA
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<b>3. Department</b>	TAPS
<b>4. Please briefly describe your idea</b>	Supervisory Control and Data Acquisition (SCADA) is a computer-based system for gathering and analyzing real-time data to monitor and control equipment that deals with critical and time-sensitive materials or events. This system is a foundational component to most industries including the water (WET) and renewable (RET) industries. We propose the creation of a Modular SCADA Training Station (MSTS) coupled with newly created modular SCADA educational curriculum created by one of our NSF:WET-ATE partners, Center for Renewable Energy Advanced Technological Education. Reid, Co-PI of the NSF award "Integrating SCADA into Renewable Energy education," will provide curriculum and lab resources along with ideation for leveraging his project for external funding. Initially, this station would be modular and connected to WET's Water Treatment components as well as to RET's Bio-Fuel System and Photo-voltaic cells but flexible enough to be used by various industrial components
<b>5. Indicate the strategic priority that this project supports. (check all that apply)</b>	Excellence in Teaching and Learning Diversity, Equity & Inclusion Organizational Health Community Connections
<b>6. How does your idea support the College's strategic priorities?</b>	The idea is strongly tied to one or more strategic priority. The idea has the potential to be a foundational element of how the College works to realize progress related to strategic priorities. Excellence in Teaching and Learning. Initially, the MSTS and curriculum will be incorporated into WET-121, 131, 245, RET-209, 211, and 213 as well as used for CEU/CWE training in both industry focused Water and Wastewater short schools. This updated innovative curriculum addition within multiple CCC programs enhances our responsive learning environments for students and employees. This project could also become a foundational hub for future expansion into; other industries, cybersecurity awareness, GUI-HMI interfaces etc. and will provide a central location for training. Organizational Health. The creation of this Modular SCADA Training Station directly ties multiple programs (RET, WET, Manufacturing) and resources together to addresses a community need (see below under Community Impact) through enhanced education and training of a foundationally critical component of our infrastructure. This station will be used for CEU/CWE training for WET/RET/IT/Manufacturing/Others industry workers and will provide tuition, fees, and FTE to the college. Community Connections. As evidenced by NSF providing grant monies for the creation of CREATE, one of our NSF-WET: ATE partners, SCADA training is needed across all aspects of industry. This, as well as personal communications with Portland Water Bureau, PG&E and others have indicated a need for more SCADA related training that CCC does not currently offer. Using this training station will provide new and in-demand training for WET industry short schools (water and wastewater) offered yearly with over 100 CEU industry students participating in each school. It will also provide training in through the RET program in SCADA processes for power utilities, renewable energy operations, automotive/electric vehicles program, manufacturing processes and more. What SCADA essentially does is take devices that were monitored and recorded manually, available remotely. Gauges that were normally read and recorded by pen and paper are now available remotely on a computer by using different analog and digital sensors. These servers connect to many controllers and these controllers tie into different sensors to monitor and record readings. This is where the danger and importance of SCADA comes into play, since you control these systems remotely. You need to know how to protect the systems with traditional networking and

	<p>cyber security suites and techniques to ensure only the people who are designed to change it are the ones who have access.</p>
<p><b>7. What contribution would this project make to the Diversity, Equity and Inclusion Strategic Plan? How does it contribute?</b></p>	<p>This Innovation request is strongly tied to the DEI strategic plan and designed to ensure that the DEI institutional plan, strategies and goals are progressing.</p> <p>Utilizing targeted recruitment through the college and our community and grant partners, will all help to reach underserved populations seeking entry-level employment and career advancement, delivering training, career coaching, employment preparation, and job search.</p> <p>Collaboration with other college programs and providers will reduce duplication and leverage existing programs' expertise, align resources, support cross-learning among community partners, and implement pathways that are inclusive of a diverse community, and prepare a more diverse workforce.</p>
<p><b>8. What problem, need or gap in service will be addressed? What evidence is readily available to illustrate the need or support the goal(s) of the project? Please include links to data sources if known.</b></p>	<p>Urgency: This idea responds to a timely, significant need felt by students/community; the newspaper headlines are related to this idea, and we expect the same to be true for the foreseeable future. Out of sight, out of mind! This phrase is often used when discussing topics such as potable water and our failing distribution systems. Similarly, SCADA is one of those hidden components that oft gets ignored but is critical to the sustainability of all communities. The impact of well-trained Water/RET/Industry technicians is difficult to quantify but is extremely important and reaches all aspects of all communities. Do you value easily obtainable clean drinking water, electricity, or even the ability to successfully flush your toilets? There is an increasing concern about filling retirement positions in the trained technicians in multiple fields. This proposal addresses one aspect of this training and is being requested by various industries as noted above. Another aspect of providing well-trained SCADA operators is reducing industrial failures and/or attacks on our infrastructure which are increasing every year. The first line of defense is trained SCADA operators. Community Impact: Prepare a more diverse workforce for employers that are seeking to incorporate DEI into their workplace. Many of our employer and agency partners have already implemented a DEI plan or are in the process of developing their plan. Better prepare students with training that is in-demand by employers across multiple sectors. Cultivating recruitment pipelines – working with workforce and community organizations to inform of new, in-demand training opportunities. Provide employers with better trained and qualified work experience or On-the-Job Training opportunities with program participants. Adopting innovative partnerships to support training retention and completion. Multiplier Effect - Better trained employees bring more value to an employer, that can result in more revenue to the company, better wages to the employee, more spending that ripples through the community.</p>
<p><b>9. What is the benefit of this project (e.g. revenue potential, impact on student enrollment, retention, completion, etc.)?</b></p>	<p>Revenue potential: With increased enrollment, retention and completion comes the increased associated revenue (Tuition, fees, FTE.). Positive Impact on Students: Research shows that this idea is likely to have significant impact on key indicators like retention, completion, and closure of equity gaps. Enhancing and updating curriculum with applications and technologies that are current industry standards always increases overall retention and completion within our programs. Coupling and incorporating these newly created SCADA educational modules with a hands-on workstation gives our students the experience and knowledge to obtain careers in the respective fields as well as to increase the ability of incumbent industry workers to either increase wages and/or increase their abilities to progress further in their industry. The incorporation of these SCADA learning modules, part of our NSF:WET-ATE grant, into our current virtual curriculum also offers geographically</p>

	limited users (e.g. WET/RET rural technicians) the ability to obtain increased and needed training that would otherwise not be available.
<b>10. What activities will be proposed in the project?</b>	Capacity to do the Work: The idea requires little to no new investments in capacity to pursue; any new/additional work are easily integrated into existing faculty/staff workload, and create new value from existing available infrastructure/resources The bulk of the activities for this project will be accomplished by both RET and WET interns (2 interns for 3 terms each) under direct guidance of faculty in RET and WET. The physical construction of the MSTs and connection to water and RET components will be done by these interns. The incorporation of the SCADA educational modules will be done by both WET and RET faculty as part of their normal workloads. The incorporation of the SCADA training modules into a virtual platform falls under the workload offered by our existing NSF:WET-ATE grant. Integration of the SCADA educational modules provided by the NSF-ATE: Center for Renewable Energy Advanced Technological Education, into current curriculum will be simple and congruous with currently taught classes. The bulk of the work will be accomplished by interns that will be directed by the WET and RET programs.
<b>11. Identify stakeholders who will likely be involved in the project planning or delivery.</b>	WET program, Dr. James T. Nurmi, Ph.D., FT faculty; RET program, Abe Fouhy, FT Faculty; CREATE NSF Center, Ben Reid Co-PI of the NSF award "Integrating SCADA into Renewable Energy education; Carrie Kraten, Director of TAPS Grants
<b>12. How do you think success could be measured for this project?</b>	Sustainability: The roadmap to sustaining this idea for future generations of students/community is clear; no resource challenges are expected at need, or to be answered in order for 5+ years. Internships. A key metric of success of this project will be reflected by the completion of 6 internship terms/classes in which students will be required to work 120 hrs, complete a 10 page written report and give an 8 minute presentation on their experiences. Curriculum. A fully integrated WET and RET curriculum with CREATEs SCADA educational modules. Modular SCADA training Station. Completion of station and use for current students and incumbent workers during short schools. Sustainability. The incorporation of the Modular SCADA Training Station coupled with educational modules into dual (WET/RET) degrees ensures sustainability (as noted above). At some point, it is highly likely that courses being offered by RET/WET/MFG could be cross-listed and thus decreasing redundancy across campus. Exposure of the MSTs to industry will also lead to increased awareness and CWE opportunities that will lead to increased FTE and tuition. Institutional/Program Health. Increased enrollment, retention and completion, leading to additional revenue through tuition, fees. Both programs are approved for student support in current grants, and future grant funds are expected to allow the same support.
<b>13. Describe the investment (time, funds, etc.) that would probably be needed to get this project off the ground.</b>	Total request: \$23,200 The bulk of the activities for this project will be accomplished by both RET and WET interns (2 interns for 3 terms each) under direct guidance of faculty in RET and WET. The physical construction of the MSTs and connection to water and RET components will be done by these interns. Budget: Paid internships (2); 120 hours each over 3 terms = \$14,400; Materials and Supplies (computers, monitors, workstations) = \$7,000 The incorporation of the SCADA educational modules will be done by both WET and RET faculty as part of their normal workloads. \$0 additional cost The incorporation of the SCADA training modules into a virtual platform falls under the workload offered by our existing NSF:WET-ATE grant. Integration of the SCADA educational modules provided by the NSF-ATE: Center for Renewable Energy Advanced Technological Education, into current curriculum will be simple and congruous with currently taught classes. The bulk of the work will be accomplished by interns that will be directed by the WET and RET programs. Budget: Training materials, printing - \$1,800 New value will be created by broadening reach of currently offered classes to multiple departments

	as well as multiple industry professionals which will lead to increased enrollment, CWE and FTE.
<b>14. Have you identified a grant or other funding source to help cover related expenses?</b>	No
<b>15. If yes to 14, please provide more information about the grant or other funding source.</b>	
<b>16. Beyond the start-up costs, is additional or ongoing funding required to maintain this project in the future? If so, please describe the costs (amounts, frequency, etc.) as well as if you have identified sources for ongoing funding.</b>	There are no additional costs anticipated to maintain this project other than those related to equipment maintenance or unexpected repairs. These costs could be covered with through fees paid to department accounts. We are also watching for new opportunities for grants and partnerships to help build and expand this project into other program areas.
<b>17. What level of urgency best fits your idea?</b>	Short-term, needs to be explored within next 4-12 months
<b>18. If you answered "other" in question 17, please describe.</b>	
<b>19. Please include additional information you would like to share:</b>	
<b>20. Please share any questions you have for the Innovation Team:</b>	

Survey for this Innovation Fund request: <https://forms.gle/7eGpWyn2GvswyuRD7>