



National Science Foundation

Expanding Lifelong STEM Career Pathways in Sustainable Building Science Technology, Award #1406320

Project Activities 2014-2015

Project Goals

1. Design a Baccalaureate of Applied Science in Sustainable Building Science Technology based in building science, incorporates energy policy, and energy codes; and
2. Build and expand recruiting pipelines for future students and workers including minorities, women, veterans, and high school students.

Project Activities

OBJECTIVE 1 – Develop innovative bachelors of applied science (BAS) curriculum in sustainable building science technology (SBST).

- 1) *Create a two-year SBST BAS curriculum that meets industry standards of excellence.*

South Seattle College (SSC) and Washington State University Energy Program (WSU) began meeting in November, 2011 to discuss the concepts for a degree in applied building science in commercial buildings. In January, 2013 SSC held an Outcomes Mapping Session with a variety of stakeholders present. This two-hour session included 37 participants representing engineering firms, developers, apprenticeship programs, government facility managers, and other entities involved in facility management and energy efficiency implementation.

In August, 2013, SSC and WSU began discussing the application to the National Science Foundation for a grant to assist in bringing the program to a higher level of achievement by forming a partnership to expand participation among minorities and women and to fund WSU, New Buildings Institute and the Northwest Energy Efficiency Council to provide subject matter expertise to the development and teaching of the course curriculum.

With the receipt of this substantial grant to support the SBST BAS, the curriculum development moved forward at an accelerated pace. The decision was made in the early phases of the program development that this degree would be constructed in the hybrid format, which for this program that translates into the students working 80% online using interactive websites designed just for this curriculum. The other 20% is spent one Saturday a month on the South Seattle Georgetown campus, when there are special lectures, team project meetings, and guest presentations. Those days are also set aside for field trips to such locations as the Bullitt Center (Seattle), and the Microsoft Global Energy Management Laboratory in Redmond WA.

This material is supported by the National Science Foundation under Grant No. 1406320.

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For the next major step, a national search was conducted and Victoria Hardy was appointed to the position of Lead Faculty in July 2014, with program coordination responsibilities in addition to teaching and curriculum development. With the new faculty leadership in place, and the active participation of the NSF partner Washington State University Energy Extension Program, course materials, textbooks and websites have now been completed for 11 of the 15 courses in the curriculum. Please see Appendix A which contains the final course sequence, and all the completed syllabi for the respective courses taught in the first year. These syllabi include all the program objectives, the course objectives, the schedule of the required face-to-face meetings, required textbooks (where indicated), and program policies. In addition, 11 websites were constructed in the Canvas Learning Management System operated by South Seattle College for the online and hybrid courses.

2) Develop internship standards and procedures, and recruit internships in all aspects of Sustainable Building Science Technology.

A specific syllabus was developed for the internship course in the curriculum sequence. Since this activity gains 9 credits in the six quarters, it was important to codify the roles, responsibilities, and reporting activities that would be required to successfully complete this requirement.

2 students completed summer internships in advance of their first quarter. The model for the ensuing internships was set with their pilot program, which included weekly reports of their activities, site visits by the faculty supervisor, and documentation of the hours spent on the internship activities. Just as a reminder, the internship model was developed through a collaboration between SSC and industry leaders, so the initial objectives were already agreed upon. With the weekly reporting requirement, administered through a Canvas website, monitoring of the activities and oversight by the faculty was greatly enhanced. This system appears to be a successful element of the curriculum.

14 of 15 students were placed in internships beginning with the second quarter. As 11 of the 15 students are working full-time, opportunities were successfully created within their organizations. As mentioned earlier, for the remaining four students, internships were pursued and secured with: the Seattle Colleges District Sustainability office; the Northwest Energy Efficiency Council (NEEC); the Highland School District (as the Interim Resource Conservation Manager); and the Virginia Mason Hospital project managed by MacDonald Miller. Industry partners such as MacDonald Miller continue to serve as excellent sources of information for internships.

3) Use of community learning laboratories

As was already mentioned, the Saturday class meetings are also set aside for field trips to community learning laboratories. These were defined as operating buildings whose personnel and leadership team would be willing to not only provide informative tours of the facilities but would also meet with the student cohort to explain and describe the operations, and answer questions about the challenges and issues. An excellent example was provided by Darrell Smith, Director of Global Energy Management for Microsoft. Smith met with the students and faculty for more than two hours explaining the Global Energy Management System. He then

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took the group into the GEM Laboratory, which is fully operational 24-7, and with his staff demonstrated the concepts he had just discussed in his lecture.

The cohort also had the opportunity for similar tours/lectures at the Bullitt Center in Seattle, frequently called the “greenest commercial building in the world” and the Eastlake Building at the Fred Hutchinson Cancer Research Center. The Eastlake Building is the newest addition to the Center and has received numerous awards including the Seattle 2030 District 2014 Visionary Award and both the Build Washington and the Washington Green 50 Awards for its construction and operation.

OBJECTIVE 2 - Recruit, retain and graduate students from industry, people of color, veterans, women and other career-changers.

People of Color

We have a specific focus on Native American tribes, specifically working with the Tulalip tribe, but also outreaching to the Lummi, Puyallup, Swinomish, Quinalt, and Snoqualmie tribes outreaching to over 200 tribal members. Activities have included:

- Assisted in the organization of a pre-apprenticeship summit with the Tulalip Tribe.
- Worked with the Tribal Liaison Subcommittee of the Washington State Apprenticeship and Training Council.
- Expanded the connection of the Tulalip Pre Apprenticeship Program with the Georgetown Branch of South Seattle Community College to enhance the curriculum for the program and link to SBST pathways.
- Worked with the Tulalip Pre Apprenticeship Program and Electricians Local 46 to investigate training in solar installations.
- Worked with the Tulalip TERO (Tribal Employment Rights Organization) pre apprenticeship to build two “tiny houses” for homeless encampments in King County in order to better understand sustainability and how it applies to the issues of homelessness.

Veterans

King County Community Services has been partnering with numerous organizations to identify potential candidates for the SBST program, including the King County Veteran’s Programs in Renton and Seattle, Wounded Warrior, Employment Security of WorkSource, and the Washington Department of Veteran’s Affairs. They are organizing a Veteran’s Career Fair at the Washington State Convention Center in Seattle for mid-July, and South Seattle College SBST program will be represented there.

Women

The Apprenticeship and Non-traditional Employment for Women (ANEW) organization has been marketing the SBST program to women through weekly information sessions, the ANEW website and Facebook pages, and emails through their listserv. In addition, they attended several events and staffed tables and/or made announcements as well as made direct contact with industry.

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Use of Innovative models for Recruitment, Retention, and Completion

1) Arrange class schedules to enable working people to attend.

- Develop a curriculum that provides at least: 30 credits online; a system to provide up to 10 credits for work-related experience; and at least 6 competency-based credits.

SSC's hybrid model is a success. 11 of the 15 students in the first cohort work full time, and could not complete their degree in a traditional format. The students are coming from as far north as Mukilteo WA and as far south as Aberdeen on the coast, a 134 mile span. The final course sequence includes 10 credits for work-related experience, all 60 credits in the online mode, and 9 credits for internships which can be done in your current work environment.

2) Cohort model

The cohort model was employed from the beginning in this program. The 15 students in the first cohort will move through the program together and support each other. An objective example of the spirit of the cohort is the following: one of the students, who works for an electrical contractor, did not find his supervisor very cooperative in creating an internship project that the student could use for credit. So one of the other students in the cohort stepped up, and offered to find a project at his workplace that the first student could do on the weekends (an analysis of utility costs and trends for a large hospital complex). As a result of this spirit, the cohort has actually lost only one member since the beginning of the program, and one person has had to "stop out" this quarter with family issues. Considering that research has shown that the retention rate in online and hybrid programs can run as high as 50%, this retention rate for the first cohort is very good.

Outreach

SSC faculty and staff have attended many events ranging from community festivals to organizational meetings to conferences to get the word out about this new degree. For 2015-2016, we attended 22 events reaching out to approximately 695 people. New outreach materials were developed.

Enrollment

Our enrollment in the first year of the Sustainable Building Science Technology program will serve as our baseline as Cohort 1.

Headcount: 15 students

Persistence: 87%

Gender: 27% female; 73% male

Ethnicity: 27% non-white; 47% white; 27% non-reported (we will try to get the non-reporters to report in future.)