



SOUTH SEATTLE COLLEGE

*One of the Seattle Colleges*



# Sustainable Building Science Technology Bachelor of Applied Science, an industry driven degree

**Energy/Facilities Connection Conference, May 5, 2016**

Victoria Hardy, Lead Faculty – Sustainable Building Science Technology BAS

[Victoria.Hardy@seattlecolleges.edu](mailto:Victoria.Hardy@seattlecolleges.edu)

Alison Pugh, NSF Grant Director

[Alison.Pugh@seattlecolleges.edu](mailto:Alison.Pugh@seattlecolleges.edu)

# Overview

- Introductions
- Goal for the session
- History of the Bachelor of Applied Science degree & NSF Grant
- What we did
- Where we are
- Moving forward
- Questions



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# Who is South Seattle College?

- One of three colleges in the Seattle College District
- Seattle Colleges serves the city of Seattle and offers programs to nearly 50,000 students
- The Georgetown campus is a satellite campus of South Seattle College
  - Largest apprenticeship training center in the Northwest (63 trades)
  - Located in the industrial area of the city
  - 3 Bachelor of Applied Science degrees
    - Hospitality Management
    - Professional Technical Teacher Education
    - Sustainable Building Science Technology



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# Who Are We?



## Victoria Hardy – Lead Faculty

- Industry experience
- Academic experience
  - Wentworth Institute of Technology
  - Ferris State University
- Extensive work with advisory committees
- Experience with program accreditation and TABs
- TAB member, now Lead Faculty

## Alison Pugh – NSF Grant Director

- Co-PI of National Science Foundation Grant, *Expanding Lifelong STEM Career Pathways in Sustainable Building Science Technology*
- Former PI of successfully completed NSF Grant
- Former Department Chair and Faculty of Energy Management program at Edmonds Community College



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Goal – To share the specifics of a successful process used to involve industry in the development of an academic program.



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# Washington State 34 Community and Technical Colleges



- 29 Community Colleges
- 5 Technical Colleges
- 18 in Puget Sound (circle)
- 22 with Apprenticeship programs
- 7 offer AAS – Apprenticeship
- 2 offer AAS-T – Apprenticeship
- 18 BAS Colleges



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# Bachelor of Applied Science Degrees in Washington State

- 2005 Legislature gives the State Board of Community and Technical Colleges authority to pilot Bachelor of Applied Science programs
- 2007 South Seattle College piloted Hospitality Management BAS
- 2010 Legislature changed from pilot to regular status
- 2013 Sustainable Building Science Technology Bachelor of Applied Science approved by the State Board
- 55 Applied Bachelor degrees are currently approved in the state of Washington



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# Sustainable Building Science Technology – A History

- Partnerships & Grants for Short-Term Training, beginning 2008
  - Workforce Development Council of Seattle, City of Seattle, Seattle City Light, NEEC
  - ARRA Funding
  - Puget Sound Regional Council i6 grant
- Labor and Industry Involvement
  - South/Georgetown have been at the table with industry and labor in this sector for more than eight years
  - Connection to Apprenticeships in the building trades
  - Developed six short-term certificate courses that provided the foundation for this degree
  - Industry and college partners have voiced a need for degree program



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# January 2013 Degree Outcomes Mapping Meeting

- More than 40 participants
- 17 Learning outcomes
  - Soft Skills – writing and communication
  - Built Environment – energy audits
  - Technical Skills – financial, computers and reports
- These learning outcomes informed the course development
  - 14 courses
  - 10 credits of work experience
  - 10 credits of internship
  - Capstone project



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# Industry-Identified Learning Outcomes

- **Systems** - Understand all operations and systems unique to sustainable buildings (old and new)
- **Analysis** - Analyze, define and validate solutions
- **Project management** - Deliver solutions from analysis
- **Communications** - Utilize effective communication forum and techniques to facilitate all aspects of sustainable building management. Read, write, present.
- **Leadership** – Develop and lead a team of various personalities and skills
- **Team skills** - Work in a team and know how to collaborate, build functional work groups and take responsibility for outcomes



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# Industry Identified Learning Outcomes

- **Critical thinking** - Be able to anticipate, identify, troubleshoot, analyze, solve problems and lead a project
- **Business skills** – Accounting, budgeting, real cost/return on investment, cost effectiveness and life cycle cost
- **Technical (building)** – Measure, diagnose and understand building system interactions and summarize results in order to compare to standards or specifications.
- **Operations and maintenance** – Understand and analyze building profiles and identify opportunities for improving performance
- **Planning and design** - Calculate, develop and understand codes and standards for construction of sustainable energy efficient buildings
- **Construction** – Understand components and drive the process of quality construction including safe work environments, documentation, contractors/sub-contractors, building options and inspection



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# Industry Identified Learning Outcomes

- **Building science principles** - Demonstrate working knowledge of building science/building physics/operating principles and their relationships to each other across disciplines
- **Financial skills** - Ability to prepare project budget, cost estimate, cost benefit analysis
- **Computer skills** - Demonstrate proficiency with MS Word, Excel, PowerPoint, electronic communication and other widely accepted software with specific intention of acquiring the ability to collect and analyze commonly available instruments, such as power analyzers, thermal imager and HVAC equipment.
- **Social value ethics and need** - Create and maintain a professional environment based on values and ethics.
- **Data management** - Use computer programs used in building industries and quality assurance to make fact based decision



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# Formed the Technical Advisory Board (TAB)

- Outcomes mapping participants from the TAC core membership
- Critical activities of the TAC
  - Refined the degree
  - Provided feedback for the lead faculty job description
  - Served on the faculty hiring committee
  - Investigated options for scholarships and internships
  - Reviewed the student application
    - Helped define the application questions
    - Helped to define the student requirements
      - AA degree
      - Work experience
      - Apprenticeship
  - Internship training agreement and learning objectives contract
  - Spread the word, recruited first cohort of 15 students



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**A National Science Foundation Partnership**

**ATE Project Grant: *Expanding Lifelong STEM Career Pathways in Sustainable Building Science Technology (1406320)***

**Three Year Project: August 2014 – July 2017**

# 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.



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# Project Activities

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

1. Create a 2-year SBST BAS curriculum that meets industry standards of excellence.
  - Partnership with WSU Energy Program
  - Creation of the technical advisory board and ongoing conversations
  - Outcomes mapping session with 37 industry participants
    - Hired Lead Full-Time Faculty, Vicky Hardy
    - 11 of 15 courses completed and taught



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# Project Activities

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

2. Develop internship standards and procedures, and recruit internships in all aspects of Sustainable Building Science Technology.
  - 9 credits of the degree
  - Rules codified
    - Internship project description
    - Weekly reports of activities and site visits
  - Continuous need for industry support



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# Project Activities

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

3. Use of community learning laboratories

- Microsoft, Global Energy Management
- Bullitt Center
- Eastlake Building at Fred Hutchinson
- Continuous need for industry support



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# Project Activities

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

- Veterans – King County Community Services
- Women – ANEW (Apprenticeship and Non-traditional Employment for Women)
- Native American Focus
- Outreach
  - 22 events
  - 695 people



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# Project Activities

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

- Arrange class schedules to enable working people to attend.
  - 80% online, 20% in person
  - Opportunity for work-related experience to transfer in for credit
- Cohort model
- Student services support



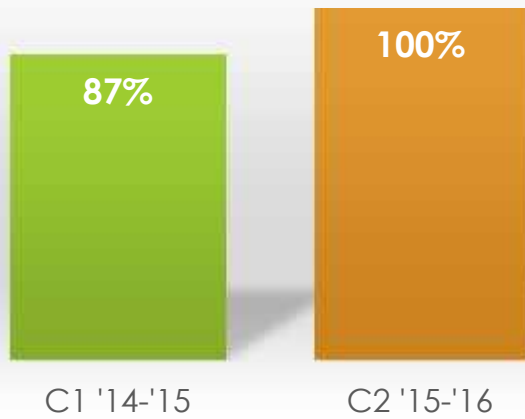
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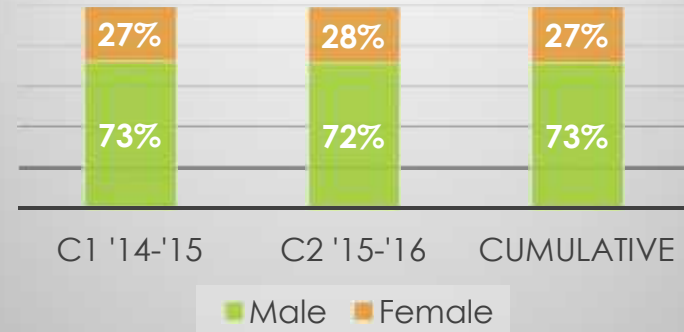
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### Persistence



### SBST Program Gender Mix



### SBST Enrollment Headcount



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# Future Activities

- OBJECTIVE 1 – Develop innovative bachelors of applied science (BAS) curriculum in sustainable building science technology (SBST).
  - Develop and offer all classes within the degree
  - Incorporate building benchmarking skills through New Buildings Institute
  - Incorporate industry-recognized certifications into the program



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# Future Activities



- OBJECTIVE 2 - Recruit, retain and graduate students from industry, people of color, veterans, women and other career-changers.
  - Seed scholarship fund with area employers
- OBJECTIVE 3 – Grow the STEM pipeline by exposing high school students to the education and career opportunities in sustainable building science technology.
  - Develop summer workshop program for high school teachers
  - Outreach activities



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# Industry's Role

- Refinement of the curriculum – JOIN OUR BOARD!
- Access to “community learning labs,” case studies, and people
- Outreach about the program
- Recruitment into the program
- Interactions with students
  - Mentoring
  - Internships
  - Jobs
- Scholarship Fund



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# Questions?

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