Committing to Green Chemistry at Bridgewater State University

Great Lakes
Green Chemistry Network
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Bridgewater State University

- Location: Southeastern Massachusetts
- 11,000+ students, 100+ chemistry majors, ACS certified
- 7 fulltime faculty, 1 FT instructor, 10 adjuncts, 4 FT staff
- Undergraduate research institutional strategic priority
- Green Chemistry since 2001
- $98.5M Conant Science & Math Center opened Fall 2012
Critical Self-Assessment: Evaluating BSU’s Green Chemistry Commitment

I. Overview - Learning objectives

Weak.....Moderate.....Strong

Chemistry majors have proficiency in:

• Theory (working knowledge of 12 Principles): Moderate

• Toxicology Principles: Weak – (Environmental conc. only)

• Laboratory skills (assess & design): Moderate

• Application (serve society): Weak - Moderate
II. Achieving the Learning Objectives

• Revisions of existing departmental curriculum: (Strong)
  - Embed green chemistry in introductory courses (Moderate)
  - Green chemistry labs (Strong)
  - Research projects (Strong)
  - Toxicology modules in existing course (Weak)

• Creation of new departmental curriculum: (Moderate)
  - Develop new green chemistry courses/programs (in progress)
  - Design toxicology course (in progress)
  - Develop seminar series (Fall 2012)

• Utilization of other institutional or external resources: (Weak)
  - Encourage students to take toxicology course from other departments (Weak - biology)
III(a) Individual Commitments

CHEM Faculty: Ed Brush (intro/organic)
Tammy King (intro/analytical)
Sam Lone (intro/biochemistry)
Steve Waratuke (organic)

- Reengineering intro/organic lab experiments (Brush, King, Waratuke);
- Advanced Environmental Chemistry (w/lab): Introduction to Green Chemistry; Toxicology modules (Brush, King);
- Content-based lecture/lab course for in-service teachers (green chemistry via guided inquiry pedagogy, Fall 2013, Brush, King);
- Advancing student engagement – research & education projects (Brush, King, Waratuke);
- K-12 Outreach (CASE and GreenLab): (Brush, King);
- Special Topics Course: Epigenetics (Lone, Spring 2012);
- Championing green chemistry inside and outside BSU (campus seminars, committee leadership, regional programs).
III(b) Departmental Commitments

• **Strategic Goals (2010):** “To emphasize chemistry as fundamental to our global society by providing courses that integrate *sustainability and green chemistry*” (direct impact on building and laboratory design of new science & math center).

• **NSF STREAMS Program (2010-14):** Developing STEM student leadership where frosh STEM students engage in green chemistry research in Summer Bridge Program;

• **“GreenLab” Outreach Education (2012):** Supported by CASE, professional development educational outreach center for the BSU community and pre- and in-service K-12 teachers.

• **CONNECT Green Chemistry Project (2013):** Collaboration with regional community colleges on green chemistry curriculum, outreach, student/faculty research.
III(c) Institutional Commitments

• BSU Strategic Goal (2010): “..to serve as an agent of social justice and sustainable practices instilling in all members of the College community a deeper understanding of the impact they each have on the greater good and our world.”

• Center for Sustainability (2006): Strategic plan focuses on student engagement and faculty development:
  - American College and University Presidents Climate Commitment
  - Integrating Sustainability in First- and Second-Year Seminars.
  - Summer undergraduate research grants.
  - Faculty summer institute on sustainability pedagogy.
  - Regional CONNECT inventory of sustainability courses/programs.
III(d) Student Commitments

• **Students for Sustainability:** Led by chemistry majors who are initiating seminar program on green chemistry.

• **Pre-Service STEM Teachers:** Developing green chemistry-based labs for introductory chemistry and high school levels.

• **K-12 Outreach:** Participated in K-12 outreach program that impacted over 180 middle school kids in summer 2012 alone!

• **Leadership:** STREAMS students are educating like-minded undergraduates about green chemistry and recruiting them as chemistry majors; drivers to create a green chemistry concentration.
Critical Self-Assessment: Evaluating BSU’s Green Chemistry Commitment

I. Learning objectives (chemistry majors proficiency):
   • Weak/Moderate (depth is lacking on why green chemistry is important and applications to solving problems)

II. Achieving the Learning objectives (how):
   • Moderate on breadth of integration

III. Individual, Departmental/Institutional, Student
   • Very Strong (was limiting factor - still growing)
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Green Chemistry Commitment Advisory Board

Thank you!

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