Faculty Challenges in a Tight Budget
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Chemistry Today

Health
Energy
Environment

Chemistry provides solutions to many of the world’s most pressing problems

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Chemistry as a Gateway to STEM

Majors that require chemistry:

- Pre-med
- Pre-dentistry
- Nursing
- Pharmacy
- Engineering
- Biological sciences
- Veterinary medicine
- Education
- Agricultural sciences
- Genetics
- Physical sciences
- Nutritional science
- And many more!
The Chemistry Department teaches as many undergraduate credit hours as some schools and colleges.
Undergraduate Chemistry Education

Department goals:

• Provide best education possible
• Providing timely access to courses, targeting 4-year graduation rate
• Faculty-taught courses
• Reducing the achievement gap
• Providing career advising and mentoring
• Providing chemistry experiences beyond the classroom
The consequence: Enrollment pressure

Undergraduate Chemistry Enrollment

25 Year Growth = +78%

Organic Chemistry Enrollment

25 Year Growth = +147%

Chemistry Majors

25 Year Growth = +219%

Chemistry’s gateway role and increases in STEM fields have produced large enrollment increases.

Other metrics show a similar and even more compelling story...
Enrollment Pressure

Current labs do not meet modern standards and cannot accommodate increased demand
Chemistry Faculty Positions

- Enrollment increases not matched with increases in faculty positions
- Faculty positions increasingly supported by non-tuition student fees (MIU) and non-permanent income sources (cluster hires)
- Lack of support from base state budget leaves long-term fate in question
Enrollment Pressure and Budget Cuts

The challenge: balancing student access to courses vs. demand for undergrad courses taught by faculty

Decreased course offerings:
• Chem 108, Chem for non-majors: Cut 1 semester
• Chem 327, Quantitative Analysis: Cut 1 lecture
• Chem 346, Organic Lab: Cut 1 semester, now taught by lab director instead of faculty
• Chem 524, Instrumental Analysis: Cut 1 semester, taught by lab director instead of faculty
• Chem 561/565, Physical: Each course now offered once every 2 years

Maximized use of facilities:
• General chemistry: Cut Chem 103 labs to every other week, added early morning labs, now runs from 7:45 a.m. to 8:30 p.m.
• Organic chemistry: Added early-morning and late-evening labs (7:45 a.m. – 9:45 p.m.)

Staffing changes:
• Laid off 2 staff members
• Did not replace a retiring faculty member
• Increased teaching load on staff lab directors
Undergraduate Chemistry Advising

Responsibilities:

• Advise up to 200 chemistry majors
• Annually place 13,000 students in optimum courses
• Train and supervise 100 TAs
• Accommodate students with disabilities

Challenges:

• Overwhelming enrollment increases
• Increasing fraction of students on campus now STEM majors, requiring improved access to chemistry courses
• Substantial number of international students
• Prevalence of mental health issues among students
Undergraduate Research and Mentoring

One-on-one mentoring through research is a transformational experience for undergraduates.

Over 130 undergraduates engage in individualized research projects with a chemistry faculty member

Benefits:

• Direct access to world-renowned faculty mentors
• Reinforces classroom learning and connect multidisciplinary concepts
• Hands-on experience with state-of-the-art facilities, research equipment
• Ticket to further opportunities
Undergraduate Research and Mentoring

Challenges:

• More students interested in research than spots available. Many students are shut out.

• Funding currently comes from gift funds or faculty research grants

• No funds for undergraduate researchers’ supplies
Budget Cuts: Direct Impact on Faculty

- Decreased take-home pay
- Decreased staff support
- Increased scrutiny
- Decreased flexibility
- Competing job offers
- Reduced efficiency
- Less favorable climate
- Decreased innovation

It is far less expensive to keep top faculty satisfied than it is to replace them.

Modest amounts of flexible funding (professorships, gift funds) have tremendous impact on faculty satisfaction, productivity, and morale.
Budget Cuts: Impact on Innovation

8+ recent companies founded by chemistry faculty members:

- WebMO
- GWC
- Silatronix
- Longevity Biotech
- PhaseTech
- Quintessence Biosciences
- OdGen
- Third Wave Technologies

- 383 inventions disclosed to WARF campus-wide (16 from chem), 2013
- Little state funding for further commercialization efforts
  ($750,000/year supporting 5 projects in 2014)
And now for some good news ...
Chemistry Building Project
UW-Madison
Current Chemistry Facilities
Proposed Chemistry Instructional Building

Makes the most of a valuable site, enables essential revitalization of HVAC across older buildings
Giving Opportunities

New eight-story tower:

- Lecture rooms, resource/study rooms, atrium (3 floors)
  - One lecture room with special amenities on main floor
- Instructional laboratories (3-4 floors)
  - Organic, inorganic, analytical, physical chemistry
- Research laboratories (1-2 floors)
  - Shared labs for collaborative research, undergraduate research

Renovation of existing buildings:

- Modernize general chemistry instructional laboratories
  - Restore weekly labs in 104, enable modern curriculum
- Undergraduate support spaces
  - Advising, student organizations, classrooms
- Chemistry Learning Center
  - Support for at-risk students
- Urgent mechanical rehabilitation
Current UW System Capital Budget Request

1. Boebel Hall Renovation, Phase II – UW-Platteville – $19.7 M
2. Chemistry Addition/Renovation – UW-Madison – $107.8 M
3. Innovation Campus – UW-Milwaukee – $75.0 M

Anticipated Timeline

State Building Commission – March 2015
Joint Finance Committee – June 2015

Architect selected: Ballinger / Strang – contract signed with state
Funding likely to be split into two biennia – project scope unaffected
Building Project: Partners

**State of Wisconsin** - $107.8 M
- Instructional facilities (labs, lecture rooms, student support)
- Mechanical rehabilitation

**Philanthropic Partners** - $15 M
- Shared research labs for collaborative research
- Additional mechanical rehabilitation
- Margin of excellence

- Strategic philanthropic naming opportunities available
- Partnerships in place by early 2015 will influence the state’s decision-making process
- Private gifts will extend the impact of this project
Summary

• UW-Madison Dept. of Chemistry is routinely ranked as one of the top 10 chemistry departments in the United States.

• Chemistry is a gateway to many degrees and professions.

• Chemistry’s 40 faculty members
  ✓ teach 13,000 undergraduate enrollments and 45,000 credit-hours/year
  ✓ mentor 130 individual undergrad researchers on individual projects
  ✓ pump $17 Million/year into the state economy via research grants.
  ✓ provide high-tech Wisconsin jobs via 8 Startup companies
But…

State budget cuts and enrollment increases place tremendous pressure on faculty, staff, and physical facilities

- Student access is increasingly difficult to provide
- Lack of “flexible” funding impedes ability of faculty and staff to innovate
- Time, financial pressure limits individual mentoring opportunities
- Faculty and staff are increasingly targets of opportunity
- 50-year-old facilities are not adequate to train 21st-century chemists

Gift funds and chaired professorships have a huge impact on productivity, morale, and our ability to innovate in teaching and research

Upcoming building provides many opportunities to help
Thank You!

Questions?

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