COLLEGE OF SCIENCE
REPORT TO THE BOARD OF TRUSTEES
ACADEMIC AFFAIRS COMMITTEE

Jeff Roberts
Frederick L. Hovde Dean

July 16, 2015
STUDENT SUCCESS

UNDERGRADUATE

Graduation rates

51% Four-year graduation rate

73% Six-year graduation rate

Also ...

3.75 Avg incoming GPA 2014-15, up from 3.62 in 2009-10

2014-15 incoming freshmen had the second highest SAT (1871) and ACT (28.5) average scores at Purdue.

College of Science’s seven academic departments:

- Biological Sciences
- Chemistry
- Computer Science
- Earth, Atmospheric, and Planetary Sciences
- Mathematics
- Physics and Astronomy
- Statistics
6.2 Average years to PhD degree in 2013-14

61% PhD students completing within six years, 2013-14

More data

- 3 NSF fellowships, average per year
- 12 graduate student teaching awards in 2015
- ~ 50% take post-doctoral positions after graduation
- ~ 33% secure jobs in research and development
- $73,000 -- Average starting salary in 2014, up from $63,000 in 2012
Learning Beyond the Classroom
“A roadmap to student success”

Professional development
* Research, internship, job shadow

Service, citizenship and leadership
* Campus leader, community service, teaching assistant

Diversity
* Mentorship, diversity organizations, study abroad

Numerous College of Science programs guide graduate students in:
• Professional development
• Entrepreneurship
• Thesis/dissertation assistance
• Funding

The CoS has 47 undergraduate majors
Within those majors, the students have numerous opportunities to experience undergraduate research:

• Honors, special projects and summer research opportunities are available;
• Some students begin as early as their first or second semester;
• Students obtain research opportunities on-campus, around the country and even around the globe.

The college has eight learning communities that give students an immersive experience in their major. One of the newest is a Statistics sophomore group. Students live, eat, work and research together for a year.
200% increase

Study abroad participation has doubled over past five years.

COSINE tutoring and Feasting with Faculty are examples of programs have been recently developed to help undergrads succeed.

The college hosts the annual Undergraduate Research and Poster Symposium. 53 Science students submitted research projects in 2015, more than twice the number that participated from 2014. Eight Purdue colleges were represented at the event.
STUDENT SUCCESS

UNDERGRADUATE EMPLOYMENT

$50,822 Average starting salary in 2014

86.9% Employed or in grad school within six months of graduation

Spotlight on Computer Science
• 95.7% employed or in grad school within six months of graduation
• Over 50% work in IT or Telecommunications
• Average starting salary: $73K

Top companies hiring College of Science graduates:

Google
VMware, Inc
Covance Inc
Accenture
MorNuCo, Inc
United States Armed Forces
Bioanalytical Systems, Inc
Epic Systems Corporation
Microsoft Corporation
Cummins Inc
Mercer
Target Corporation
Procter and Gamble Co
STUDENT SUCCESS

STUDENT DEBT

Undergraduate

61.2% Debt free! Second lowest of all the colleges (2013-14)

$27,696 2.3% below university average

Graduate

85.4% Debt free! Second lowest of all the colleges

$33,235 16.8% below university average

Bio grad Iyabo Akinsanmi
All departments’ graduate programs are in the top 55 in the nation.
CS is ranked No. 20 in the U.S.
Analytical Chemistry program is ranked No. 1.
INSTITUTIONAL EXCELLENCE

FACULTY RESEARCH

$312 M

Research dollars to the college over five years

Average Awards per tenure/tenure track faculty member ($ thousands)

Sponsored program awards (in millions)

2011 2012 2013 2014 2015


PURDUE UNIVERSITY
Dr. Graham Cooks, Henry Bohn Hass Distinguished Professor of Chemistry

Inducted into the National Academy of Sciences on April 28; one of the highest honors for a scientist; joins fellow College of Science professors Ei-ichi Negishi, Jay Melosh and Michael Rossmann in NAS

2 Nobel Prize winners

29 Distinguished/named professors

3 Term named professors

36 Charles B. Murphy Award-winners
New assistant professors hired, percentage retained

Leading faculty

EAPS and Physics Prof. Jay Melosh (left) and Physics Prof. Chris Greene.
Computer Science Expansion

- Already met goal of undergraduate enrollment increase; nearly 1,000 students makes the department the largest in the college
- Raising money for professorships, grad and undergrad support, Center for Cybersustainability
- Faculty and graduate student expansion now underway
- New Data Science program
- New masters program in Cyber Security

Drug Discovery

- Several colleges share in the Discovery: Veterinary Medicine, Health and Human Sciences, Engineering, Agriculture, Pharmacy and Science
- Search for junior and senior candidates conducted in spring; more than 100 scientists considered for positions
- Entrepreneurial opportunities; already working with KinaSense, Biokorf, AniDyn and more
Fall 2015 Undergraduate applications are up 25% since last year.

This year's entering CoS class size is projected to be more than 1,100 students, an increase of ~ 17% over last year.

Demand is especially strong for Computer Science!

**Undergraduate**
- Since 2010, UG yield rates have held relatively steady at 30%

**Graduate**
- Since 2009, GR yield rates have increased from 35% to 54%
INSTITUTIONAL EXCELLENCE

FACULTY ENGAGEMENT

232  Total credit hours instruction per tenure and tenure-track faculty (T/TT) FTE; University average is 155

11:1  CoS undergraduate student to T/TT faculty member ratio

4:1  CoS graduate student to T/TT faculty member ratio

Gallup-Purdue Index, CoS Faculty

- **Future well-being:** 85.4% believe they will be thriving in five years
- **Current well-being:** 81.8%

Chemistry Prof. Mahdi Abu-Omar
CoS affiliated start-ups include:

[Logos of various start-ups]

14 College of Science faculty members received patents in 2013-14 fiscal year.

Dr. Philip Low, Ralph C. Corley Distinguished Professor, Director of the Purdue Center for Drug Discovery, Chief Science Officer at Endocyte, Inc.
INSTITUTIONAL EXCELLENCE

CLASSROOM TRENDS

52 IMPACT classes; 18 added last year

19 online courses

7 hybrid courses

Summer is becoming the busiest time for distance learning classes.

Everyone takes a Science course
- More than 75 percent of students in our lower division classes come from other colleges.
- All Purdue undergrads take a Math or Statistics class.
INSTITUTIONAL EXCELLENCE
ONLINE COURSE ENROLLMENT
INSTITUTIONAL EXCELLENCE

NEW HYBRID DEGREE PROGRAM

Cyber security masters program

• Debuting in Fall 2016
• Demand for cyber security specialists to grow 53% by 2018 – Bureau of Labor Statistics
• Programming and computing experience during undergrad preferred
• Most courses to be project-based
• Industry expected to be involved
• Expect there to be 15-20 students enrolled in the first year, growing to ~50 students in a steady state

Assistant Prof. Mathias Payer, one of 13 faculty already signed on to lead the new masters program
Science K-12 Outreach Program

- 25 years increasing interest and achievement in K-12 science and mathematics
- Since 1989
  - Over 5,000 school visits
  - Over 19,000 teachers participating
  - Over 800,000 students participating

• Engagement Highlights
  - Science Express
    - Anderson Foundation
  - Content Thematic Units for Integrated STEM Education (CTU 4 ISE)
  - Science Express in Gary Schools
  - Professional Development for Computer Science (PD4CS)

Prof. Rafael Lang presents a physics lesson to a spin class at the Co-Rec, a unique Science Outreach event.
OPERATIONAL EXCELLENCE

ORGANIZATIONAL STRUCTURE

Faculty structure
- Tenured/Tenure Track
- Clinical/Research Faculty
- Visiting Faculty
- Continuing Lecturers

More faculty data ... 
389 total faculty (317 tenure/tenure-track)
19% female faculty (tenure/tenure-track)
6% minority (tenure/tenure-track)

More staff data ... 
From 2009 to 2015
A/P decreased 8.2% (university increased 7.3%)
Clerical decreased 29.8% (university decreased 21.9%)
Service decreased 29.7% (university decreased 7.6%)
IT reorganization

- Formed teams of IT personnel who do the same (or similar) things working together, cross training each other and learning from each other.
- Reached out to experts to learn from each other on how to do new things and how to help customers across the College instead of specifically to the departments.
- More hands involved when there are emergencies or outages - working as a team to solve the issues quickly.
- Made sure that the people answering the helpline can help you or get someone quickly to you when you have an issue.

We have become a team instead of individuals to support the College of Science needs as a whole, working in harmony.

January customer satisfaction survey found 75% were happy with reorganization
OPERATIONAL EXCELLENCE

OPERATIONAL EFFICIENCY

• Consolidated offices (Directors of Development)

• Reduced printing costs throughout the departments

• Converting foundational courses to use open source textbooks

• Lab equipment cost savings
Passport to proper pipette use
• Chemistry Prof. Marcy Towns used ITaP–developed Passport digital learning platform to show proper pipette use for students.
• Last summer, students had to upload videos of themselves properly pipetting before classes started.
• Broken pipettes had cost the department $3K a semester.
• Towns’ efforts are already saving money and equipment.

LON-CAPA
• “Learning Online Network-Computer Assisted Personalized Approach”
• LON-CAPA is a full-featured course management, learning content management and assessment system.
• Department of Mathematics uses the network for its open-source textbooks for four first-year level classes.
• Saved students more than $600K per year
OPERATIONAL EXCELLENCE

NEAR TERM, HIGH PRIORITY FISCAL ISSUES FOR COS

• Finding funds for rapidly escalating start-up costs
• Providing adequate research and teaching laboratory space, especially in Computer Science and in the life science disciplines
  -- Lilly Hall and Brown Laboratory renovations
• Life sciences “pillars”

ACADEMIC GOALS

• Continuous improvement in the quality of undergraduate student programs
• Continuously increasing level of research activity in the College
• Maintain and build on the strength of the College’s signature engagement activity, Science K-12 Outreach
• Improve the quality and consistency of the College’s programs to support student and faculty diversity through a reorganized and reenergized Science Diversity Office
• Raise the visibility, stature, and reputation of the College’s activities in research and learning
• Elevate the level of philanthropic giving to support College academic priorities
• Encouraging faculty turnover through retirements
• Staff and faculty morale

  Solutions: salary plan, college-level awards program, college-supported professional development funds for staff, Science research awards
THANK YOU

Questions?