ENGINEER CHANGE

EXPANDING PURDUE’S COLLEGE OF ENGINEERING

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The John A. Edwardson Dean of Engineering
Board of Trustees, September 25, 2014

https://engineering.purdue.edu/Engr/AboutUs/StrategicGrowthInitiative
OUTLINE

1. Drivers and contexts
2. Status of the expansion
3. Goals for impact
4. An opportunity to innovate
5. Challenges
6. Opportunities for the future
ENGINEERING GROWTH

DRIVERS AND STATUS
Drivers for Growing Engineering

Internal Drivers

- Year after year growth in Purdue Engineering applications and enrollment
- Year after year increase in quality of the incoming class

From 2012-2016, grow by 1,500 students: half undergraduate, half graduate
Drivers for Growing Engineering

External Drivers

- Central to innovation, economic development, and jobs creation
- Central to addressing the 21st century Grand Challenges
- National call to graduate 10,000 more engineers/year

By 2016 Purdue will graduate over 5% of these engineers
PARAMETERS OF THE GROWTH
SUMMARY OF THE EXPANSION FROM 2011 TO 2016

- Undergrad-to-Faculty ratio goes from 21.2 to 17.6
- 10% growth
- 27% since 2006
- Renovated/Leased/New
ENGINEERING EXPANSION STATUS

73% of growth target

49% of target

48% of target

38% of target

2014-15 undergrad-to-faculty ratio of 19.9

36% of target
FINANCING THE PLAN

$150M+ PURDUE INVESTMENT IN THE FIRST 5 YEARS
$150M+ DEVELOPMENT GOAL

29% of goal
36%
45%
19%
ENGINEERING GROWTH

GOALS FOR IMPACT
Contribute to increasing the national capacity for innovation and economic development

Purdue will graduate 1 out of 20 of the 10,000 more engineers/year
2 Amplify our impact

- 3rd largest College of Engineering: both # undergrads and # grad students
- More ground-breaking discoveries
- More inventions delivered to market
Enhance our students’ experience

Enhance the quality of interactions between faculty and students by improving the student-to-faculty ratio from 21.2 to 17.6
4 Increase our diversity

Faculty hiring and student growth at this scale is an opportunity to make dramatic gains in our diversity, which in turn transforms everything we do.
Expand our capacity for innovation in engineering education

Purdue can be **THE** leader in demonstrating how hands-on experiential learning can happen **AT SCALE**
6 Sharpen the focus on what Purdue Engineering is known for

Preeminent research teams that will position Purdue for recognized leadership
Expand engagement

Become the partner of choice for industry, the university of choice for entrepreneurs, and the national model for statewide economic development
8 Enhance reputation of Engineering and Purdue
GROWTH + TRANSFORMATION

OPPORTUNITIES TO INNOVATE
4. FACULTY HIRING STRATEGIES

WHAT WOULD CATAPULT YOUR RESEARCH AREA TO INTERNATIONAL PREEMINENCE?

1. Strong leadership
2. Promise of preeminence
3. Promise of transformative impact
4. Potential for collaboration
5. Potential for research funding from diverse sectors
6. Contribution to educational enterprise
7. Contribution to innovation and entrepreneurship
8. Leveraging existing strengths and infrastructure
PITCHING PREEMINENT TEAMS
CONNECTING THE RESEARCH WORLD AND THE ENTREPRENEURIAL WORLD

5-minute pitch + 5-minute Q&A to distinguished panels
F13 - 32 teams, 4 selected / F14 - 27 teams, Oct 9 final round

Faculty lines, resources, space
2013 PREEMINENT TEAMS
SHAPING THE FUTURE

- Implantable Networks of Wireless Nanoelectronic Nodes for Medical Treatment
- Energetic Materials: Science, Engineering, Sensing, and Detection for Defense & Security Applications
- Flexible and Efficient Spectrum Usage
- Quantum Photonics
First workshop March 2014
Invited to apply
  - Postdocs and advanced Ph.D. students
  - Seeking faculty careers
  - From top 10 schools in each field
Selected 30 from 130 applicants
  12 women, 3 under-represented minorities
Program
  - Sessions on skills faculty need
  - Interaction with faculty, tours
Results – interest in faculty position at Purdue
  - Before: 2 extremely interested (3.08 out of 5.00)
  - After: 14 extremely interested (4.24 out of 5.00)
MAKING ROOM
RE-ENVISIONING SPACE

Lease + Renovate

Build New / Expand

GRIS
EE
ME
HAMP (CE)
Wang Hall 4th floor "swing" space

Flex Lab
Zucrow
New Construction
MJIS (BME)
IDC Student Projects
CoE renovations

• Increase space use efficiency by 50%
• Increase energy efficiency
• Increase daylight to all areas of building
• Open spaces, shared spaces, touchdown spaces
• Collaboration spaces
• Conference rooms and focus booths
• Enhance incorporation of technology
• Improve accessibility
• Improve ergonomics
CHALLENGES

• Staying competitive in faculty hiring and retention
  • Salaries and startups in a competitive market

• Minding the gap(s)
  • Enrollment growth outpaces faculty growth, which outpaces facilities growth → urgency of Flexible Research Lab
  • Limits to growth in a given location / building → offices and teaching labs in central campus, research in Discovery Park or leased space

• Supporting teaching and learning
  • Modernize classrooms while GRIS/EE/ME/HAMP are empty
  • Limits to growth in a given location / building → central classroom building(s) for continued faculty + student growth?

• Connecting the dots
  • Campus-wide transportation plan
OPPORTUNITIES FOR THE FUTURE
ENGINEERING EXPANSION V2.0?

- Modeling / testing factors needed for sustained growth
  - Student demand, demographics
  - Faculty hiring – supply, trends, retention capability
  - Research funding trends / projections
  - Resources: salaries, startup, space, development limits

- Decisions / actions that could bend the curves
• With the student-faculty ratio in balance ...
  • Explicitly connect Engineering’s growth to Purdue-wide goals
  • Explicitly leverage Engineering’s growth to foster Purdue-wide collaborations
  • Explicitly link enhancing Engineering’s reputation to enhancing Purdue’s reputation

From outcomes of growth to drivers of future growth
We will be known for our impact on the world.