Purdue University
School of Chemical Engineering

Strategic Plan 2015-19

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Committee Members

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Introduction: This strategic plan is formulated as a guide for the School of Chemical Engineering during the next five years. It reflects the School's focus areas to achieve our vision.

Vision: Continue to be among the premier chemical engineering programs in the world.

Mission: Provide students with a rigorous and relevant education, conduct field-defining research, and enhance the School's global impact.

Values: Integrity, excellence, leadership, diversity, sustainability

Education

A. Undergraduate Programs

Maintain a highly capable, motivated and diverse body of undergraduates, and help them to obtain a strong and relevant education throughout their Purdue experience.

***Strategies**:*

i. Prepare students for success in industrial, academic, and other careers

ii. Continually review the curriculum to maintain its relevance to current and future societal needs

iii. Enhance teaching effectivenss in undergraduate curriculum

iv. Expand opportunities for internships, Co-Ops, and undergraduate research

***Metrics**:*

a) Employment and graduate school placements

Target:

- Complete employment database upon graduation and five years later
- Complement senior exit interviews with alumni surveys five years after graduation to track changes in employment status

b) Obtain regular feedback from students, alumni, and Industrial Advisory Council on curriculum relevance to industrial careers

Target:

- Complement senior exit interviews with alumni surveys five years after graduation to track changes in student perspectives
- Prepare biennial report from Industrial Advisory Council on curriculum relevance to industrial careers

c) Annually review responses for course quality and instructor performance from student evaluations

Target: The evaluation for all courses and instructors should be above 3.5 out of 5.0.

d) Number of students engaged in internships, Co-Ops, and undergraduate research

Target:

- 75% of students participating in internships or Co-Ops
- 25% of students involved in undergraduate research projects

B. Graduate Programs

Recruit and retain a high-caliber, motivated and diverse body of graduate students, promote the scientific visibility and development of PhD students, and increase the size and impact of the Professional MS program.

***Strategies**:*

i. Increase enrollment of high-quality domestic and international graduate students

ii. Promote graduate student applications for nationally competitive fellowships and travel grants

iii. While continuing our tradition of success in producing industry leaders, encourage PhD graduates to pursue an academic track

iv. Increase participation in the Professional MS program

***Metrics**:*

a) Average GPA and GRE scores, and undergraduate research participation of incoming graduate students

Target:

- 70% domestic graduate students enrolled in the PhD program
- Average GPA of 3.8/4.0 for incoming students
- Top 10% on GRE scores for incoming students
- 80% of students engaged in undergraduate research for at least one academic year

b) Number of graduate students who successfully compete for external fellowships and travel grants

Target: 25% of graduate students with external fellowships and travel grants

c) Number of PhD students who pursue and accept tenure-track faculty positions

Target:15% of PhD graduates accepting tenure-track faculty positions

d) Enrollment in the Professional MS program

Target: 50 students per year enrolled in the Professional MS program

Research:

Pursue breakthrough research that extends the boundaries of chemical engineering into areas that promote sustainability and have the greatest positive impact on our global society.

Strategies:

i. Strengthen our position in areas where the School is preeminent, including: catalysis and reaction engineering, pharmaceutical engineering, and process systems engineering. Continue to build upon our strong foundation in areas including energy (e.g., solar, fossil, bio-based, energy storage), molecular simulations, polymers, and the biological domain of chemical engineering.

ii. Recruit and retain exceptional faculty whose interests align with our strategic and emerging research areas

iii. Focus efforts on securing large, interdisciplinary, multi-year research projects that have potential for significant impact

iv. Engage new companies that partner with the School in collaborative research programs at levels of $100K per year or more

v. Encourage development of intellectual property

Metrics:

a) Number of faculty publications in peer-reviewed journals, especially those with high-impact

Target:

- 8 distinct publications per faculty FTE per year
- 0.25 review/perspective articles per faculty FTE per year
- 4 publications for each PhD graduate where they are the lead author
- Field-defining papers in emerging research areas

b) Number of publication citations, including h-index values for each faculty member

Target:

- 200 citations per faculty FTE per year *(Web of Science)*
- Average School h-index of 25 *(Web of Science)*

c) Number of national and international awards for research and professional progress

Target: 1 per faculty FTE every 3 years, which may include division awards

d) Research funding

Target:

- External funding to maintain a group size of 8 PhD students per faculty FTE
- Sponsored research expenditures at $750,000 per faculty FTE per year

e) PhD student graduation rates

Target: 1.5 PhD students graduated per year per faculty FTE

f) Number of companies that partner with the School in collaborative research programs at levels of $100K per year or more

Target: 0.33 of the faculty FTE

g) Number of invention disclosures and patents

Target: 4 patents per year for the entire School; 2 disclosure per faculty FTE per year

Global Impact

Educate undergraduate and graduate students who will be successful in a global environment. Cultivate and expand research and educational relationships with prominent international institutions.

***Strategies*:**

i. Increase undergraduate student participation in Study Abroad Programs

ii. Strengthen existing and add new study abroad partnerships to ensure outstanding student experience

iii. Increase the number of international visiting scholars and exchange students

iv. Expand existing relationships with international institutions to include overseas research opportunities for faculty and students

Metrics:

a) Number of graduating students who participated in Study Abroad Programs

Target: At least 20% of undergraduates have a Study Abroad experience (summer, semester, or year) upon graduation

b) Number of international study abroad partnerships

Target: Add 5 new international study abroad partnerships including schools from Latin America, Asia, and Europe

c) Number of international visiting scholars and exchange students

Target: At least 30% more international visiting scholars and exchange students (baseline is 2013-14)

d) Number of papers published that have a co-author from an international institution

Target: 1 per faculty FTE per year

Development

Secure and improve the School's financial foundation and enhance faculty resources while balancing short- and long-term goals.

Strategies:

i. Raise funding for faculty start-up expenses

ii. Increase the endowment for unrestricted uses (e.g. special initiatives, program and facilities enhancements) and restricted uses (professorships, undergraduate scholarships, and graduate fellowships)

iii. Increase the number of alumni who donate to the School annually by approximately 100 per year and double the number of ChE Ambassadors Club members

iv. Increase the number of Industrial Advisory Council members by one per year and encourage all companies to contribute at the full annual level

***Metrics*:**

a) Complete the fundraising goals for faculty support, student support, facilities, programs, and unrestricted

Target: Total $33.5M

- Faculty Support ($14M)
- Student Support ($4M)
- Facilities ($4M)
- Programs ($4M)
- Unrestricted ($7.5M)

b) Number of alumni who donate to the School annually

Target: 1,100

c) Number of ChE Ambassadors Club members

Target: 400

d) Number of Industrial Advisory Council companies

Target: 25

Engagement

Encourage faculty, students and staff to develop and engage in activities in the professional community, with industry and the local and Purdue community to enhance the overall academic experience.

***Strategies**:*

i. Increase the number of faculty who advise and collaborate with industry

ii. Increase the number of faculty, staff and students who serve in leadership positions for professional organizations

iii. Increase industrial participation in the Co-Op and internship programs

iv. Encourage faculty, staff and students to support and participate in outreach activities

v. Establish presence in the distance education arena

Metrics:

a) Number of faculty engaged in consulting with industry

Target: 50% of faculty FTE

b) Number of faculty, staff and students serving in leadership positions for professional organizations

Target: 50% of faculty FTE, 5% of staff and students

c) Number of industrial partners participating in the ChE Co-Op program

Target: Engage 10 more companies in the Co-Op Program

d) Number of outreach activities organized per year

Target: 20 activities per year (AIChE annual meeting, plant tours, ChE Kids Day, ChemE Car competition, Purdue Homecoming, Purdue Family Day, Purdue Electric Vehicle Grand Prix, other student organization activities)

e) Number of prominent core and elective online courses

Target: 10 courses over the duration of the plan

Culture and Environment

Foster an environment that is dedicated to excellence in achieving the educational and research objectives of the School. Encourage professional development, leadership, and team-building activities. Support recognition by internal and external award nominations. Promote a culture of respect and inclusiveness, and a commitment to safety.

Strategies:

i. Increase participation in professional development activities

ii. Increase national and Purdue award nominations

iii. Provide diversity training that includes respect and tolerance; increase the number of seminar speakers from groups that are traditionally underrepresented in science and engineering

iv. Provide an incident-free work environment and renew the Purdue safety indemnification annually

Metrics:

a) Number of staff members who participate in professional development activities, such as conferences, workshops, etc.

Target: 3 professional development activities per year per staff member

b) Number of national level and Purdue (college and university) awards received by faculty, staff, and students

Target:

- Faculty, 1(teaching and service) award per year per faculty FTE
- Staff, 0.1 per staff FTE per year
- Graduate Students, 25% receive awards every year

- Undergraduate Students, 10% receive awards every year

c) Number of faculty, staff, and graduate students who complete diversity training; number of seminar speakers from traditionally underrepresented groups in science and engineering

   Target: 100% completion of diversity training for all faculty, staff, and graduate students; 3 seminar speakers from underrepresented groups per year

d) Successful completion of all lab and office safety audits, and required safety training for all faculty, staff, and students

   Target:

   - No safety incidents
   - A thorough review of all near-miss incident reports
   - 100% completion of safety audits and safety training per year

e) Quantify effectiveness of these strategies through the level of satisfaction index obtained via the faculty, staff, and student environment survey

   Target: An average GPA of 5 (out of 6) or higher for each category, no specific grade below 4

Note: All metrics will be evaluated on an annual basis. The baseline year is 2013-14.