

Strategic Plan for Purdue College of Science

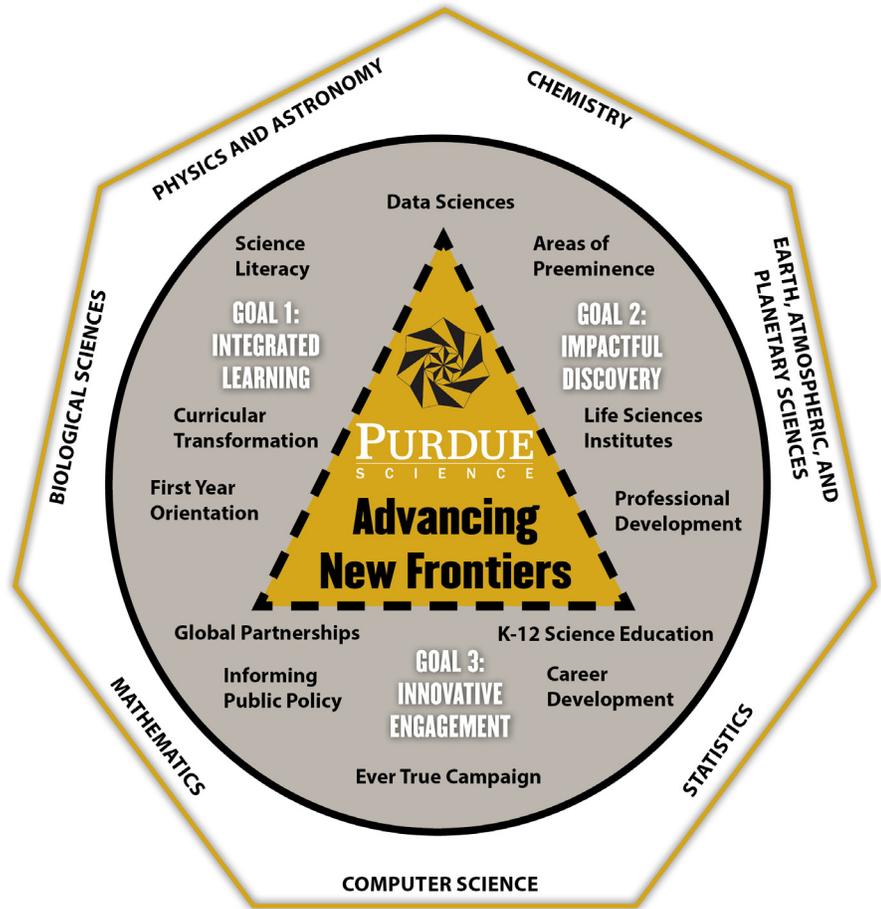
MISSION

To foster a diverse, inclusive, and globally aware community of faculty, staff, students, and other partners, dedicated to advancing discovery, learning, and engagement in the fundamental sciences, and its translations, that expand the boundaries of knowledge, and prepare highly competent scientists and scientifically literate citizens.

VISION

Advancing New Frontiers

To advance new frontiers in fundamental and translational sciences with new knowledge and learning, by solving scientific and societal grand challenges, and by expanding science awareness at-large.



Key Characteristics:

- **Distinguished faculty** who conduct groundbreaking research of global impact, lead scholarship in teaching/learning, discovery/research/creative endeavors, and promote engagement/partnerships, recognized by scientific communities, and society.
- **Transformational discovery with field-defining research, innovation, and invention** that advances new and emerging fundamental and translational sciences that nurture human curiosity, expands knowledge, solves complex problems characterizing scientific and societal grand challenges, contributes to improving quality of life, and catalyzes business and industry development and economic prosperity.
- **Integration of multiple learning approaches in fundamental and translational sciences** with:
 - * **Demonstrable science literacy in all curricula at the University** as an indispensable component of core education.
 - * **Focused science learning that provides foundational support to University-wide 'STEM'-based curricula**, with collaborative education and educational research endeavors.
 - * **Exemplary education in all curricula in the College at the undergraduate, graduate and postgraduate levels** that prepares outstanding scientists and leaders with intellectual, theoretical, and professional development.

- **Leadership in innovative science engagement** with sharing of science knowledge and applications toward Science Education—starting from the K-12 level to prepare future ‘STEM’ students, all the way to professional and public levels—facilitating awareness of critical issues in science and society to inform science policy.
- **Cohesive, dynamic, and constructive College culture** that nurtures and champions constructive program interrelationships, human and intellectual diversity and inclusion, creativity and academic freedom, and a positive climate promoting the success of all individuals.
- **Sustained optimum levels of supportive resources and services**, including state-of-the-art infrastructure with high performance facilities and technologies, along with human and financial resources, complemented by a nimble, and transparent administrative organization.

University, local, national, and global levels, enriched by a wide breadth of pedagogies, rewarding learning outcomes, creativity, and enhanced quest for knowledge and skills.

- **Effective mentoring and advising of students** with dedicated support services for achieving curricular and career choices, learning achievements, and timely degree completion.
- **State-of-the-art learning facilities and infrastructures** that encourage, support, and advance science learning at increasing levels of maturity and sophistication.
- **Integration of high performing technologies and resources** to advance interactive pedagogies, learning flexibilities, and ubiquitous access to science learning.

GOALS

Goal 1: Integrated Learning

Achieve excellence in integrating multiple learning approaches in science, with breadth and depth of knowledge and skills at the undergraduate through postgraduate levels.

Key Characteristics:

- **Integration of multiple learning approaches in fundamental and translational sciences, including reaching out to a breadth of non-science areas for educational enrichment**, in order to achieve:
 - * **Science literacy** for all undergraduate students.
 - * **Supportive science foundations** for ‘STEM’-based curricula.
 - * **Focused discipline-based and interdisciplinary science learning** with leadership and communication skills, for students in the College at the undergraduate through graduate and postdoctoral levels.
- **Inclusion of a wide range of robust experiential learning experiences** in diverse and inclusive learning environments at the

Key Strategic Initiatives:

- **Undertake curricular transformation** to deploy evidence-based pedagogies to assure optimal learning in all courses enhanced by co- and extra-curricular experiences.
- **Define and inform the University core curriculum to assure science literacy** for all undergraduate students as a distinct hallmark of a Purdue education.
- **Develop first year orientation programs** in all College of Science undergraduate curricula that focus on disciplines/majors, with exposure to all science areas in the College.
- **Establish academic programs in Data Sciences** as interdepartmental initiatives at the undergraduate and graduate levels.
- **Enhance collaboration among science teacher education programs within the College of Science** in partnership with the College of Education, in order to optimize effectiveness and efficiency of program delivery and operations.

Goal 2: Impactful Discovery

Demonstrate leading-edge discovery and scholarship at the frontiers of fundamental sciences, science knowledge, and learning, with worldwide impact.

Key Characteristics:

- **Advancement of the frontiers of fundamental and translational sciences** to expand the boundaries and opportunities of discovery and scholarship.
- **Quest for knowledge driven by human curiosity** to energize leading-edge discovery.
- **Advanced scientific thinking** that positions the College at the global forefront of discovery, scholarship, innovation, and invention.
- **A culture that promotes and rewards interdisciplinary and collaborative endeavors** to coalesce intellectual resources for the advancement of discovery and scholarship, with impacts on learning and engagement.
- **Diverse and inclusive human and intellectual resources, and sophisticated infrastructure systems** that support and catalyze individual and collective successes at all levels.

Key Strategic Initiatives:

- **Identify established preeminent research areas, and emerging areas of research focus that are positioned for preeminence** in which to invest in new faculty hires to achieve a critical mass needed to establish these as other signature areas for the College.
- **Establish Data Science as an interdepartmental signature area of research** through the creation of an identifiable faculty cluster with a roadmap for developing national prominence.
- **Enhance College engagement in the Discovery Park research institutes including the newly established** Purdue Institute of Integrative Neuroscience (PIIN), and Purdue

Institute of Inflammation, Immunology and Infectious Diseases (PI4D) through focused faculty recruitment.

- **Review and revise promotion and tenure criteria and processes** to assure that diversity of scholarly contributions, including interdisciplinary research, high-risk research, and global collaborations are appropriately encouraged, recognized, and rewarded.
- **Establish a College-level professional development program** that creates an environment in which faculty and staff are equipped and empowered to reach their full potential.

Goal 3: Innovative Engagement

Promote innovative public engagement facilitating science awareness, and the societal impact of science.

Key Characteristics:

- **Innovative engagement in advancing science literacy of the public**, serving diverse populations, and disseminating outcomes that are valued by scientific communities, policy-making bodies, and society at-large.
- **Strategic partnerships that advance the commercialization of intellectual property, align relevant science programs with societal needs**, and share knowledge, skills, and resources for the advancement of sciences.
- **Effective participation with K-12 education** to help inform and prepare a diverse and inclusive population of future students for 'STEM'-based education and careers.
- **Distinction in improving individual and societal quality of life** with the scientific contributions of various College disciplines working in concert, and with professional and societal constituencies.
- **Effective engagement of College alumni** in advancing the visibility of the College, promoting science advocacy, and responding to critical

Key Strategic Initiatives:

- **Formalize career-mentoring programs** for undergraduate students, graduate students, and postdoctoral fellows, by engaging and networking with a diverse and inclusive body of alumni, industry, and academic constituents.
- **Optimize K-12 engagement** to reach at-risk, underrepresented, and underprivileged students to nurture their interests in pursuing 'STEM'-based careers.
- **Develop new and enhance existing formalized global partnerships** to expand study abroad offerings, and identify academic and industrial research collaborations.
- **Enhance public communication programs** to facilitate the development of data-informed public policy, and to educate the public on the importance of scientific advances.
- **Fulfill the College's role in the University's on-going 'Ever True' capital campaign** to develop transformational philanthropic support for the College.

Assessment of Progress

A select set of **key metrics** is identified below as the plan's **'dashboard' metrics**. They signify the vital outcomes of the College's performance and progress relative to the Mission, Vision, and Goals described in the plan. All metrics will require specific definitions as part of the implementation of the plan. The metrics that directly correlate with University-wide metrics will require corresponding definitional consistency. The dashboard metrics identified below will be supplemented by initiative-specific metrics as the College begins implementing this plan.

- Undergraduate student retention and graduation rates by curriculum, department, and at the college-level in comparison with those of the University.
- Graduate student time-to-degree.

- Total extramural research funding, funding per FTE faculty, and total research expenditures.
- Research and scholarship outcomes – scholarly publications, patents, and licenses for inventions and innovations
- K-12 teacher engagement for science education.
- Philanthropic support as a part of University's 'Ever True' campaign.

IMPLEMENTATION

The implementation of this strategic plan will require concerted efforts of the College's administration, faculty, staff, and students depending on the scope of each strategic initiative. The overall leadership of the Dean will be complemented by leadership responsibilities of the associate deans, department heads, faculty representatives, staff representatives, and student representatives (as necessary).

While some of the strategic initiatives have been initiated and/or are on-going in limited scope, the College leadership team will identify specific initiatives of the highest priority in each of the three Goal areas. A number of task forces will be created by the Dean to undertake the development of these initiatives in order to define the objectives, characteristics, scope, deliverables, personnel roles, and preferred time lines for implementation.

The College's leadership team will identify the resource requirements for implementing the plan. These resources will include human resources, financial resources, facilities resources, and organizational/administrative resources.

This strategic plan is focused on **Advancing New Frontiers** — an aspiration the College is keenly dedicated to achieve. The College's community of leaders, scholars, professionals, a broad spectrum of learners, the alumni, and other external constituencies will be actively engaged in their respective roles in executing the transformative initiatives captured under the plan's goals — **Integrated Learning, Impactful Discovery and Innovative Engagement** — a bold framework for the College's future.