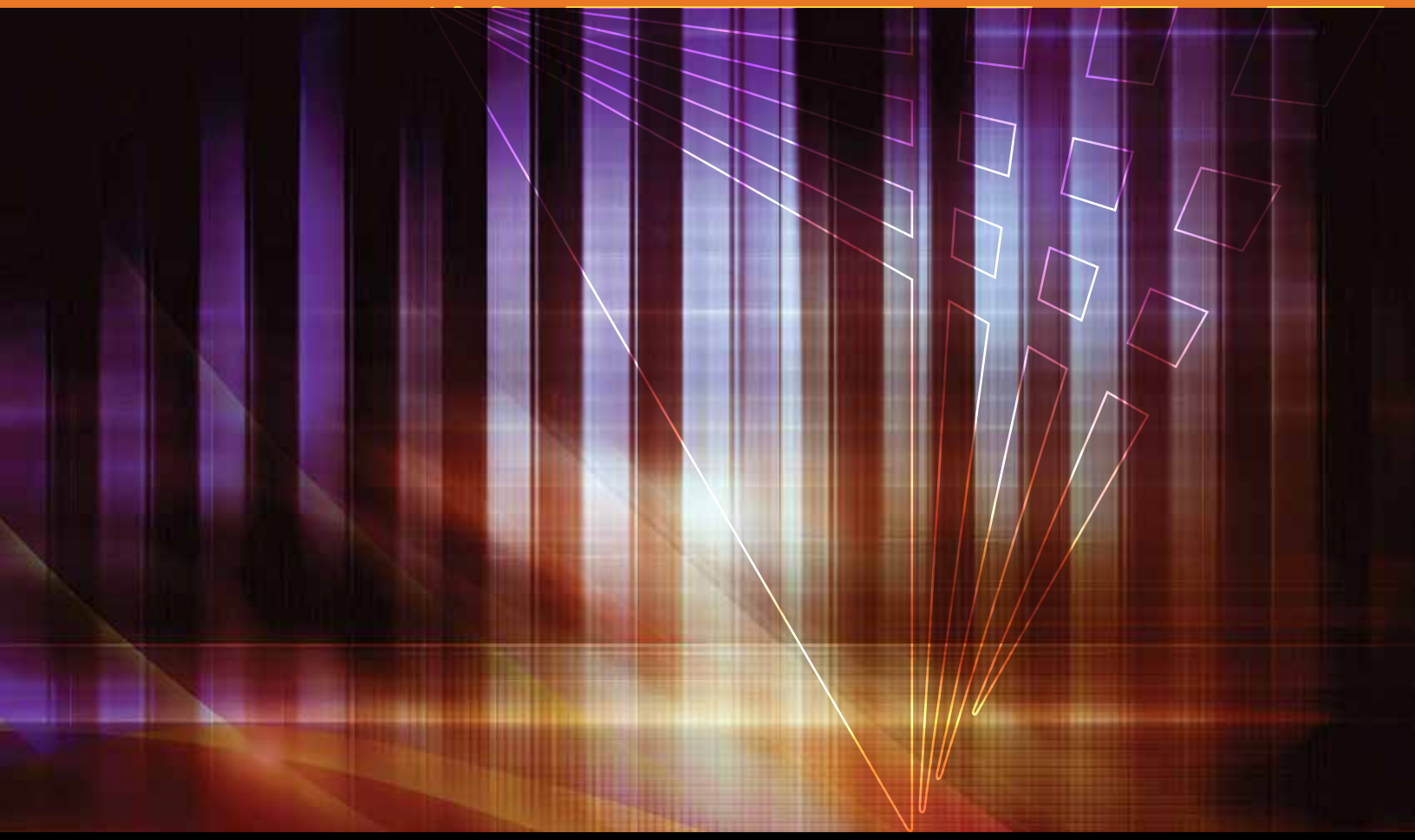
COLLEGE OF SCIENCE

Strategic Plan Summary



ILLINOIS INSTITUTE OF TECHNOLOGY

COLLEGE OF SCIENCE STRATEGIC PLAN SUMMARY

Strengthening Science; Rigor and Relevance

Introduction

The College of Science is the center of scientific discovery and application at the Illinois Institute of Technology. As the second-largest and fastest growing college at Illinois Tech, the College houses an expanding base of internationally recognized basic and applied research that serve as a foundation for a relevant and rigorous STEM education.

After separating from Armour College in 2003, the College of Science has achieved significant growth in the past decade. Nearly one-third of the faculty is new. Many specialize in computation-focused areas (bioinformatics, computational chemistry, etc.), a growing area of expertise for the college. Faculty have received CAREER awards, endowed chairs, and other forms of professional and scholarly recognition.

Serving nearly all Illinois Tech undergraduates, the College of Science is the largest in number of teaching hours. Within the College, the number of first-time freshmen grew by 60 percent and overall enrollment by a third. Emphasizing rigor and relevance, the College established new programs in data science, computational decision science and operations research, bioinformatics, applied physics, environmental chemistry, and mathematical finance. Professional masters programs continue to grow to meet educational and market needs.

In accordance with the previous strategic plan, the Pritzker Science Center has undergone renovations with Stuart Building slated for improvements. The College has established new endowed chairs, endowed scholarships, partnerships, and endowed distinguished lectures.

To build on this success, we are setting a clear course for the future.

This plan is cognizant of market forces will shape our research and students. The explosive growth of employment opportunities in data science/analytics and scientific computing is well matched to our strong computational research groups and educational programs embedded in all disciplines. A source of strength and challenges for the College are its strong ties to national laboratories whose funding has become more variable. The College recognizes this is an opportunity to both diversify our research portfolio with additional industrial partners, and to join with our traditional laboratory partners on new grand initiatives that will shape the direction of science for the coming decades. To take advantage the new growth opportunities the College will require new and modernized laboratory spaces and improvements to our physical infrastructure.

The College is aligned with the University in recognizing there are challenges to the educational paradigm of traditional discipline specific B.S., M.S., and Ph.D. degrees, as well as a decline in the number of students attending college in the United States, and a reduction in the number of Illinois high school graduates choosing a college in Illinois. The College is well positioned to meet the growing non-traditional needs of students through expansion of its successful professional masters programs, and to serve a more diverse audience through lifetime learning and continuing education. This College will focus on efforts to better attract and serve students from our local communities, and develop means to increase participation of students from backgrounds currently underrepresented in STEM fields.

Preamble

This document is guided by the following premises:

- Commitment to excellence, quality, and rigor in the pursuit of all goals.
- Commitment to building financially, logistically, and practically sustainable solutions within each priority
- Centrality of students to our success.

Approach

This plan was the result of the work of the Strategic Planning Committee, which consisted of representative faculty from all departments plus staff, initiated by the Dean and managed by Illinois Tech's Center for Research and Service. Input for this document came from eight focus groups conducted by the Strategic Planning Committee of faculty, students, and staff, as well as surveys conducted by the Center for Research and Service. We have used the answers to help guide the plan for our activities for the next four years, 2018-2022.

2018 Mission

The College of Science will support world leading research and education in an environment that enables strong collaborations and the nimbleness to respond to emerging themes. The College will accomplish this mission by prioritizing leadership in research, scholarship, and educational innovation, and enable success through investment in modern infrastructure and human capital.

2018 Vision

We will produce scientific scholarship of the highest quality, and prepare our graduates to lead in science and industry, to think broadly and practically, and conduct themselves ethically.

Guiding Themes

This strategic plan identifies four themes that serve to guide the priorities of the College of Science.

Research Leadership

Research and its impact on society are at the core of a world-class academic institution. The College of Science aspires to improve the world through the education of generations of future scientific and industrial leaders. The College of Science holds a strong and diverse research portfolio built by renowned scholars who are committed to conduct first class impactful research. Among the distinctive strengths of the College are its versatility, its interdisciplinary research, and its strong connections with industry partners, national laboratories, and research centers.

The College of Science aims to be a group of scientists and educators that sets the national research agenda. To continue to strengthen the research areas at which we excel, and to pioneer the emerging fields of research, the College of Science will need additional space with modern infrastructure, labs, classrooms and collaborative spaces for innovative research. The College of Science will create research centers that align with national research priority goals, and use the existing research centers to leverage available resources to attract new talent and to grow our international reputation.

Educational Innovation

A confluence of technological, societal, and economic factors are driving profound transformation of the needs and possibilities of higher education in the 21st century. The College of Science will be at the forefront of these developments, capitalizing on our agility, scientific expertise, and technological prowess to develop and evaluate new STEM educational models and methods. The College will develop the resources and administrative support needed for such educational innovation, as well as incentive structures to encourage faculty to do so.

Educational collaborations between departments within the College will be encouraged through leveraging of cross-cutting expertise in computational science, life science studies, and more.

Potential curricular innovations include developing modular interdisciplinary programs that will give greater flexibility to students in developing interdisciplinary degree programs; integrating design- and maker-spaces into science education, in collaboration with the Innovation Center; implementing teaching methodologies such as the flipped classroom or mastery-based education; and integrating emerging technologies such as augmented reality, simulations, and cloud-based group workspaces into educational programs. We will support and expand our successful professional master's degree programs, which can also serve as testbeds for evaluating some of these educational innovations.

The College will establish a taskforce and resources to support research on new and existing innovations. Resources needed will include larger and technology-equipped classrooms and other appropriate equipment and space for new educational activities.

Collaboration in the 21st Century

Collaborative efforts have grown substantially in all human endeavors, accelerated by the information age. The development of strong collaboration skills among the faculty, staff, and students extends beyond research, management, budgets, and meetings; it fosters strong relationships and community. External-facing collaborations with other academic institutions, national and related research laboratories, and industrial projects are critical to research excellence, educating students of all career stages, and building high impact, vigorous research programs.

Emerging Themes

New concepts and technologies will continue to emerge in the STEM fields, presenting new avenues for research and new employment opportunities for our graduates. The nature of these emerging opportunities cannot be predicted in advance, but the College of Science will be agile and adaptable to take advantage of them.

The College of Science is well positioned to rapidly develop initiatives to stimulate new research efforts within the college and in collaboration with outside institutions. The new Center for Interdisciplinary Scientific Computation is an example of this type of initiative. Our ability to lead cutting edge research is strengthened by our relationships with other scientific organizations in the Chicago area including partnerships with national laboratories, institutes, and other universities. Equally, the College is able to respond to emerging career opportunities for our students. We are able to develop new educational programs, including interdisciplinary programs and professional masters degrees that respond to the changing educational landscape. Recent examples include new undergraduate degrees in Astrophysics and Bioinformatics and several highly-regarded professional masters degrees.

The College of Science will build the physical infrastructure and develop the administrative procedures needed to facilitate rapid responses to the changing STEM landscape.

Strategic Priorities

Priority: Research and Scholarship Leadership

Promote leadership in scientific and technological exploration and discovery.

Goal: Build on existing areas of strength ensuring critical mass and attracting top scholars

- Provide state-of-the-art laboratory spaces
- Leverage growth in computationally-oriented research across disciplines
- Increase percentage of funded Category 1 faculty to 80%

Goal: Strengthen active research centers of excellence

- Provide adequate unified space for center operations
- Promote active management
- Increase research productivity through centers

Goal: Facilitate collaborative research

- Create centralized common spaces to foster collegiality, productivity, and collaboration
- Develop mechanisms to promote internal collaborations
- Develop centralized space for shared equipment

Goal: Diversify portfolio of research partners to ensure sustainability and market responsiveness

- Leverage location in Chicago to increase partnerships with industry and national laboratories
- Increase research administrative support for developing and maintaining partnerships with external entities

Goal: Increase the visibility of our research and scholarship

- Invest in marketing, communications, and public relations to raise the visibility and reputation of the college
- Promote recognition of faculty accomplishments within the College and University
- Provide resources where needed for faculty to speak and publish internationally
- Support initiatives to invite visiting scholars

Goal: Improve our national and regional rankings for all departments

Priority: Educational Innovation and Leadership

Build on strengths of the faculty and programs to be a leader in 21st century science education.

Goal: Build career preparation as an integral part of academic excellence and leadership

- Create spaces to promote collaboration, collegiality, and creativity
- Promote more interactive learning, problem and project-based learning, and highly applied coursework
- Build on the success of the professional master's programs and use as a model for growth
- Increase educational partnerships with industry and national laboratories

Goal: Support faculty to build innovative educational experiences

- Provide flexible modern classroom spaces for innovative educational experiences
- Regain leadership in online education, including improving the user experience, content, and testing
- Equip and support faculty to develop new teaching methodologies
- Ensure robust evaluation and feedback systems for teaching
- Assess and understand the effect of machine learning on higher education

Goal: Grow the College

- Build diverse domestic and international enrollments
- Develop scholarships for underrepresented populations in STEM
- Ensure sufficient faculty/staff recruitment to both serve the existing student body and enable future growth
- Manage growth so enrollment and capacity are in balance

Priority: Modern Infrastructure and World-Class Facilities

Create the facilities necessary to support growth in cutting-edge research and technology, innovative educational models, collaborative spaces for research and community, and flexible adaptation to future opportunities.

Goal: Secure the funding for a new building for the College of Science that includes state-of-the-art facilities for research, education and collaborative spaces

- Create new cutting-edge research laboratories
- Create collaborative spaces for research
- Create a centralized home for centers
- Create a centralized home for departments to increase informal student and faculty interactions
- Create modern classrooms with flexible seating enabling small-group interactions

Goal: Update and maintain existing infrastructure and facilities

- Maintain safe, advanced research spaces
- Develop a plan to provide sufficient power and HVAC for computing activities
- Upgrade networking capacity

Priority: Excellence in Human Capital and Support

Invest in our people and make the College of Science a "best place to work."

Goal: Align human capital with the college's vision, mission, and strategic priorities

- Ensure competitive compensation to attract and retain top talent
- Optimize staff size to meet the needs of the college
- Adopt policies and processes to support efficient operations

Goal: Cultivate leaders within the college

- Establish formal professional development programs for faculty and staff
- Provide faculty training in media relations and public science communication

Goal: Recognize faculty achievements

- Develop funding for endowed chairs
- Encourage nomination of faculty for professional society, regional, and national awards

Goal: Ensure safety measures are taught and adhered to across all college operations and research