

Proposal for New Engineering Buildings at Stony Brook University and the University at Buffalo

5% 

The percent of U.S. students earning engineering degrees vs. China (37%) and India (21%).
(World Economic Forum, 2016)

 **36th**

New York State ranks near the bottom in the 5-year growth rate of engineering degrees – half the rate of California.
(ASEE, 2016)

 **1M**

The number of STEM workers needed in the U.S. over the next decade.
(Bureau of Labor Statistics, 2017)

2.5X 
FASTER

The rate at which STEM careers are growing in NYS compared to other fields.
(Division of Research and Statistics, NYS Department of Labor, 2014)

Engineering New York State's Workforce of Tomorrow

Many more students are majoring in engineering, straining resources at Stony Brook University and the University at Buffalo, as technology is widely recognized as the driving force for tomorrow's economy. Self-driving vehicles are on the horizon; smart machines will rebuild crumbling infrastructure. Smart materials will redefine apparel, buildings and much more. Nanobots in our blood vessels will redefine medical care. Technology will be called upon to slow climate change with clean energy and cleaner industries.

Vast numbers of new engineers and applied scientists will be required to invent, produce and oversee our technology-driven future and engineering employment has a direct economic benefit. Studies show that for each new engineering job, five related jobs are created – the majority high-skilled.¹ But U.S. technology leadership, with its huge economic benefits, is now severely challenged.

To stay competitive, not only are more engineers and applied scientists required, but a new paradigm is also needed for their education. Their education must include vertically integrated design projects from freshman to senior year, to incubation of student start-ups. It must also include cross-cutting educational programs integrating data and computational science, engineering, medicine, humanities, and social sciences.

The proposed new engineering buildings at Stony Brook University and the University at Buffalo will be designed with active-learning studio classrooms and spaces, and the resources needed to turn student collaborative efforts into new ventures. These new buildings will support the significant growth in engineering and computer science by providing modern space for experiential learning, industrial quality labs, and entrepreneurial maker spaces, which in turn will enhance the focus on engineering-driven medicine, energy systems for sustainability, resilient cities and ecosystems, cybersecurity and AI-driven discovery.

1. Mark Muro, *Multiplier Effects: Connecting the Innovation and Opportunity Agendas* (Brookings Institute, 2012), <https://www.brookings.edu/blog/the-avenue/2012/08/23/multiplier-effects-connecting-the-innovation-and-opportunity-agendas/>.



Stony Brook University College of Engineering and Applied Sciences



Did You Know?

Stony Brook and UB have been leading SUNY in engineering degree production, with five-year growth rates of 62% and 49% respectively, both faster than the national rate of 37%.

ENROLLMENT 2017-2018

UNDERGRADUATE: 4,136

60% GROWTH OVER 5 YEARS

GRADUATE: 1,649

20% GROWTH OVER 5 YEARS

Educating the Innovators of Tomorrow

Stony Brook's College of Engineering and Applied Sciences is educating the next generation of global innovators to effect change in areas critical for improving the human condition and sustaining humanity. We are inventing the future by advancing cross-disciplinary research in engineering-driven medicine, artificial intelligence, and clean energy for a more sustainable future and much more, and are well-positioned to drive global and regional economic development.

College of Engineering and Applied Sciences Facts & Figures

FRESHMAN CLASS PROFILE 2017-2018

Average High School GPA: 95.1

Average SAT Score, Math and Critical Reading: 1374

Average Score of SAT/ACT Converted: 1408

RESEARCH AND ECONOMIC DEVELOPMENT

More than \$35M in annual research expenditures (25% increase since 2015)

More than 20 centers and institutes, generating over \$1.5 billion annually in regional economic impact, including:

- Advanced Energy Research and Technology Center
- Center for Biotechnology
- Center of Excellence for Wireless and Information Technology
- National Security Institute

Cross-cutting research initiatives in:

- Energy systems for sustainability
- Smart and resilient cities and ecosystems
- Engineering-driven medicine
- Securing cyber-everything

About Stony Brook

Stony Brook University is a powerful incubator of teaching and research innovation. Stony Brook is ranked among the top 100 universities in the nation, and is a member of the Association of American Universities. Home to more than 25,700 students, the University offers more than 200 undergraduate programs and 140 graduate programs.



Elevating Engineering Excellence

Founded in 1946, UB's School of Engineering and Applied Sciences is the oldest public engineering school in the State of New York. We discover new knowledge, leverage the strengths of a diverse and open academic community, and educate leaders that advance the resilience, sustainability, health, and economic well-being of our region, our state, our nation and the globe.

School of Engineering and Applied Sciences Facts & Figures

FRESHMAN CLASS PROFILE 2017-2018

Average High School GPA: 93.4

Average SAT Score, Math and Critical Reading: 1301

Average Score of SAT/ACT Converted: 1338

RESEARCH AND ECONOMIC DEVELOPMENT

More than \$59M in annual research expenditures

Fifteen centers and institutes, including:

- Center for Multisource Information Fusion
- Center for Unified Biometrics
- Center of Academic Excellence in Information Systems Assurance, Research and Education
- MCEER: Earthquake Engineering to Extreme Events

Cross-cutting research initiatives in:

- Energy, environment and water
- Sustainable manufacturing and advanced robotic technologies
- Global health equity
- Computational and data-enabled science and engineering
- Sustainable transportation and logistics



University at Buffalo

School of Engineering
and Applied Sciences

Did You Know?

Stony Brook and UB rank in the top 25% of public engineering graduate schools nationwide, according to U.S. News & World Report in 2018.



ENROLLMENT 2017-2018

UNDERGRADUATE: 4,099

43% GROWTH OVER 5 YEARS

PRE-ENGINEERING: 1,125

157% GROWTH OVER 5 YEARS

GRADUATE: 1,902

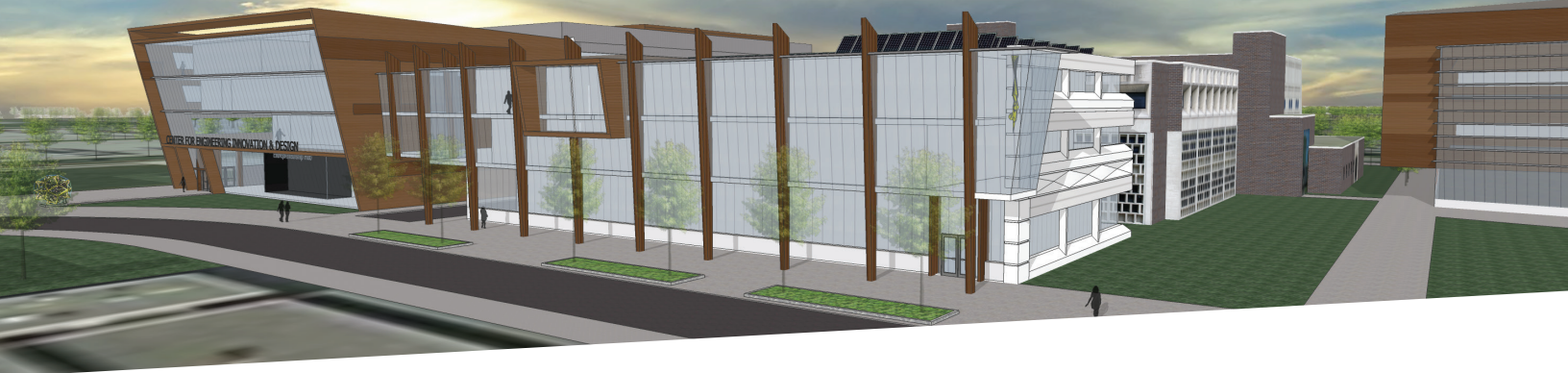
44% GROWTH OVER 5 YEARS

About UB

The University at Buffalo is a premier, research-intensive public university dedicated to academic excellence, and a member of the Association of American Universities. UB is home to more than 30,600 students, making it the largest and most comprehensive campus in the SUNY system. We offer more than 110 undergraduate degrees, and over 300 graduate, professional and certificate programs.



We request a \$200M investment in SBU and UB to power New York State's technology-driven economy.



Educating for the Future

The approach to teaching and practicing engineering has evolved over recent years, with our understanding that active learning is critical to student success. Our undergraduate programs emphasize hands-on, team-based learning, and opportunities for students, faculty, staff and industry to work together, with support for entrepreneurship. However, we lack the facilities to adequately accommodate these activities at scale.

Our Request

Together, Stony Brook University and the University at Buffalo produce over 20% of the engineering degrees in New York State. We are the two main producers of engineering graduates within SUNY and face shared challenges of surging enrollments and inadequate facilities to support engineering instruction that aligns with industry expectations.

Stony Brook University will seek \$100M and the University at Buffalo will seek approximately \$100M to construct new engineering instruction buildings on each campus to address the enormous growth and projected increases in engineering enrollments, in support of New York State's workforce and entrepreneurship needs over the coming decade.

Our immediate priority is to design and build two state-of-the-art buildings, one on each campus, that promote active learning, inspire creativity and emphasize innovation and entrepreneurship. Modern laboratories, studio lecture rooms, and collaborative spaces for the most innovative teaching and learning methods will elevate and set a new standard for engineering excellence.

Snapshot of Facilities

As engineering innovation and design centers on their respective campuses, these new facilities will provide students with the tools, opportunities and experiences to become tomorrow's global leaders. As critical components in educating the next generation of engineers and applied scientists, proposals for the new buildings include:

Entrepreneurship Hub, the headquarters for partnerships between students, faculty, industry leaders and venture capitalists, leveraging research and innovation for technology transfer and business development to allow ideas to move into the marketplace at a faster rate.

Engineering Commons, Industrial Labs and Maker Spaces, housing all the resources necessary for student build projects to take shape, including computer design labs, cutting-edge prototyping and machine shops, project assembly bays, team rooms and more.

Collaborative Classrooms to foster experiential learning with the flexibility to divide into more intimate learning environments, fully equipped with multi-media and interactive technology.

Contact

Michael Arens
Assistant Vice President of
Government and Community
Relations
Stony Brook University
(631) 632-6624

Robert M. Mayer Jr.
Director of State Relations
University at Buffalo
(716) 645-4095



Stony Brook
University

UB
University
at Buffalo