

**VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
(Agency 208)**

Capital Project Budget Amendment Proposal

Undergraduate Laboratory Building

	<u>2020-21</u>	<u>2021-22</u>
Additional Funds Requested:		
General Fund	\$90,500,000	\$0
Nongeneral Fund	\$0	\$0

The Undergraduate Laboratory Building (208-18332) is the university's top priority instruction project in its capital outlay plan and was included in the Detailed Planning Pool appropriated in Item 4 of Chapter 759 of the 2016 Acts of Assembly with an effective date of July 1, 2017. Preliminary Designs are complete and have been reviewed by the Division of Engineering and Buildings in accordance with the state's Cost Review Process. The project scope and costs are within the Six-Year Capital Outlay Plan Advisory Committee funding report recommendation. Preliminary Designs (Detail Planning) are complete and Working Drawings are underway and will be complete June 2020. After these designs are reviewed by the Division of Engineering and Buildings, the project would be ready for construction funding starting July 2020.

This science instructional facility is a companion building to the undergraduate Classroom Building (completed in 2016) to address enrollment growth, support innovative instructional approaches of the 21st Century, and meet STEM-H instructional needs, including the core curriculum of all tech talent pipeline students. The University needs a larger inventory of modern instructional laboratories to support significant prior and current enrollment growth in the STEM-H disciplines. Modern laboratories are necessary for students to work with the latest technologies and participate in interdisciplinary teams to meet the training expectations of industry and government. Without this project, the University cannot provide the necessary training experience for the STEM-H students or be positioned to accommodate growth for additional STEM-H majors.

In the 15 years from fall 2004 to fall 2018, the university's total on-campus undergraduate majors grew 30 percent, from 21,330 to 27,729. During this same period, undergraduate STEM-H majors grew 60 percent, from 8,041 to 12,866. Thus, as the total number of students expands, the number of STEM-H majors is growing at a faster rate. Another enrollment surge for fall 2019, accentuated by STEM-H majors, is accelerating the needs for laboratory instruction space. Virginia Tech graduates the highest percentage of STEM-H majors each year in the Commonwealth and leads the state overall in STEM-H degree production, with over 4,600

degrees awarded annually. This represents 54 percent of Virginia Tech's total degree production and 24 percent of the statewide STEM-H degree production in public universities.

Looking forward, the university expects to grow further on-campus undergraduates further through fall 2023. A significant portion of this growth is expected to be in the STEM-H areas and support degrees associated with the tech talent pipeline. This growth will largely be in engineering, data sciences, computer science, traditional physical and life sciences, as well as in new degree programs such as neuroscience, nanoscience, packaging, biomedical engineering, and public health. The increase in the number of STEM-H majors and the strategic actions of the university to address the Top Jobs 21 goals and the tech talent pipeline creates significant pressures on existing science instructional laboratory facilities. For example, in the years from 2004 to 2017 (the last full year for which data are readily available), lab student credit hours in physics have jumped 45 percent, from 4,094 to 5,936. Physics is a key service discipline for engineering and other physical science majors. Likewise, biology laboratory credit hours, a key service discipline for the broad range of life science majors at Virginia Tech, increased 51 percent.

The university last constructed an undergraduate laboratory facility in 2004 for instruction in chemistry and physics. The university's existing inventory of science laboratory instruction facilities is now too small and generally outdated to accommodate the current and growing demand, instrumentation and integrated nature of instructional spaces for advanced engineering and science majors. Much of the instruction for these programs is currently housed in older facilities with equipment that is inadequate to support modern instructional methods and limitations on the section sizes in which lab courses can be delivered. Unable to accommodate the demands of growing STEM-H programs with the existing inventory, the university is confronted with the need to construct new instructional laboratories. This project is designed to meet the laboratory instructional needs of faculty and their students enrolled in courses that are part of the growing STEM-H emphasis.

The building design includes a 102,720 gross square foot, four-story structure, clad in a combination of Hokie Stone, precast concrete panels and trim, and a combination of curtain wall glazing and punched opening windows. The building site is located in the north academic section of campus at a major entrance to campus and on an existing paved parking lot adjacent to the new undergraduate Classroom Building that was opened in August 2016. Successful design principles from the undergraduate Classroom Building, including 24/7 student space, will be replicated in the Undergraduate Laboratory Building. The building design includes a strong connection to the site with hardscaping for exterior classroom sections.

The program for this building includes 28 teaching labs (16 wet and 12 dry), a discovery suite and instrument lab (each composed of a mix of smaller wet and dry labs), numerous lab support spaces, 6 classrooms, 5 offices, graduate teaching assistant work space, informal study areas, student/faculty collaboration areas, conference rooms, and space for supervised student research projects. This request is for authorization and funding to complete the Undergraduate Science Laboratory Building capital project and to reimburse the University for temporarily funding the planning work with nongeneral fund resources. The total project budget request is \$90.5 million and the funding plan calls for General Fund support.