Approved by the Board of Trustees

November 17, 2022

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Board Meeting

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# ESTABLISH THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE + PHYSICS, THE GRAINGER COLLEGE OF ENGINEERING, URBANA

**Action:** Establish the Bachelor of Science in Computer Science + Physics, The

Grainger College of Engineering

**Funding:** Tuition revenue from the program is expected to cover any funding for

specialized faculty hires needed to cover increased sections of required courses and to hire an academic advisor. All required courses currently exist. No new technical resources, library resources, or facilities are needed.

The Chancellor, University of Illinois Urbana-Champaign, and Vice President, University of Illinois with the advice of the Urbana-Champaign Senate recommends approval of a proposal from The Grainger College of Engineering to establish the Bachelor of Science in Computer Science + Physics (B.S. in CS + Physics).

The proposed B.S. in CS + Physics responds to the growing need for computation throughout physics research and the industrial positions in which physics graduates most often work. Physicists regularly work in areas which fall into the intersection of physics and computing, including quantum computing and modeling of physical systems. Quantitative modeling in general is a large growth area in many of these fields, and computational thinking is a core proficiency needed for addressing today’s most challenging scientific problems. The Physics Department has a core of faculty who conduct research in various computational areas, including computational condensed matter, computational astrophysics, computational biophysics, quantum

computing, and lattice quantum chromodynamics (QCD). Students who have these interests are not well served by the existing B.S. in Physics or B.S. in Computer Science degrees, and they will benefit greatly from a degree that blends these disciplines.

The proposed program will provide a strong foundation of physics and computational science, enabling students to explore diverse applications such as quantum computing, numerical methods, and machine learning. Graduates will be trained to pursue careers that blend the fundamental analytical tools presented in physics with computer-based implementations. They will be prepared for advanced study at a graduate level in computational physics, scientific computing, or computer science, as well as for immediate entry into the workforce in areas of quantum information science, computational physics in industry, and traditional computer science/information technology.

At an anticipated cohort of 25 students per year, additional staffing is not necessary. The program’s tuition revenue is expected to cover the needs for additional class sections in required courses. If the program’s enrollment outpaces the anticipated demand, the Department of Physics will increase staffing to meet the needs of the students. Sections of required upper-division Physics courses for students in the B.S. in CS + Physics will be created, gearing toward training in computational approaches. Specialized faculty will be hired to teach these sections, and a senior academic advisor would be hired to advise students in the proposed program separately from Physics. Tuition revenue will be used for these hires. Job placement will be facilitated by career fairs organized by The Grainger College of Engineering and Engineering Career Services, as well as more specialized career events in the Department of Computer Science. Current facilities and library resources are sufficient to address the program’s needs.

The Board action recommended in this item complies in all material respects with applicable State and federal laws, University of Illinois *Statutes*, *The General Rules Concerning University Organization and Procedure*, and Board of Trustees policies and directives.

The Interim Executive Vice President and Vice President for Academic Affairs concurs with this recommendation. The University Senates Conference has indicated that no further Senate jurisdiction is involved.

The President of the University of Illinois System recommends approval. This action is subject to further review by the Illinois Board of Higher Education.