BOARD OF TRUSTEES
UNIVERSITY OF THE DISTRICT OF COLUMBIA
UDC RESOLUTION NO. 2017 –

SUBJECT: APPROVAL OF DOCTORATE OF PHILOSOPHY IN COMPUTER SCIENCE AND ENGINEERING DEGREE PROGRAM, SCHOOL OF ENGINEERING & APPLIED SCIENCES

WHEREAS, pursuant to D.C. Official Code 38-1202.06, the Board of Trustees (the "Board") of the University of the District of Columbia (the "University") has responsibility to generally determine, control, supervise, manage, and govern all affairs of the University, including to establish or approve policies and procedures governing admissions, curricula, programs, graduation, the awarding of degrees, and general policy for the components of the University; and

WHEREAS, pursuant to 8B DCMR §308.1, new associate, baccalaureate, and graduate degree programs may be added to the University curricula upon recommendation by the Academic Senate and the President and after approval by the Board; and

WHEREAS, Science, Technology, Engineering & Mathematics (STEM)-related careers have long been identified as critical to the future of the region and the United States, and to the nation's ability to remain competitive with or ahead of the international community; and current studies; and

WHEREAS, the School of Engineering & Applied Sciences (SEAS) has recommended the implementation of a Doctorate in Philosophy (Ph.D.) in Computer Science and Engineering Program (a "CSE Doctorate Program"), based on projected workforce demands and opportunities, as well as on surveys of students; and

WHEREAS, the Dean of SEAS and its faculty have worked for over five (5) years to develop a world-class CSE Doctorate Program that they believe will attract and retain high caliber faculty for the University, and that these faculty, consequently, will provide world-class training and experiential learning to the University's students and the community; and

WHEREAS, the University administration proposes to establish the CSE Doctorate Program, based in SEAS, and the CSE Doctorate Program has been approved by all required levels of faculty and administration.

NOW THEREFORE, BE IT RESOLVED that the Board hereby authorizes the University to implement the CSE Doctorate Program.

Submitted by the Academic &
Student Affairs Committee: November 14, 2017

Approved by the Board of Trustees:

November 28, 2017

Christopher Bell
Chairperson of the Board

UNIVERSITY OF THE DISTRICT OF COLUMBIA
1851

FISCAL IMPACT STATEMENT

TO: The Board of Trustees

FROM: Managing Director of Finance

DATE: October 17, 2017

SUBJECT: Doctoral Program in Computer Science and Engineering Proposal

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Conclusion

It is concluded that there is sufficient funding to support the implementation of the doctoral program in Engineering and Computer Science in the School of Engineering & Applied Sciences (SEAS).

Background

Pursuant to D.C. Code § 38-1202.06 (3), the Board of Trustees has the authority to approve, establish, or approve policies and procedures governing admissions, curricula, programs, graduation, the awarding of degrees, and general policy for the components of the University.

The SEAS has developed a doctoral program in Computer Science and Engineering (CSE Ph.D.) that has been based on projected workforce demands and opportunities, as well as on surveys of students, including graduates of the University. Research has shown that offering both Master- and Doctorate-level programs will increase the overall number of graduate applications, and that graduate students admitted to the program will help enhance the quality of the research conducted by the faculty, which is essential to them for expanding applications for research grants from sources such as the National Science Foundation (NSF), the Department of Education (DoE), and the Department of Defense (DoD).

Financial Impact

The proposed new academic program will be supported by existing faculty resources within the Engineering Department. In addition to the use of existing faculty resources, to fund costs in years 1-2 of a 5-year plan, the program anticipates enrollment will increase gradually from the first year of implementation with five students, and with an average annual increase of five additional students until year four.

During the initial first two years of the program, an amount of $470,000 will be allocated to fully support the CSE Ph.D., from an existing Army Research Office Grant: *Department of Defense (DoD) Research and Educational Program for Historically Black Colleges, Universities, and Minority Serving Institutions*.

Risk and Assumptions

The SEAS have been quite successful in securing federal and private grants over the past three years (2014 – 2017). The grant amounts have increased from approximately $300K in 2013 to $3M in 2017. It is anticipated that the implementation of this doctoral program will strengthen grant activities, and there will be potential revenue from direct grants and the associated indirect cost revenue to offset most of the expenditures in the out years (3-5) of the CSE Ph.D. program.

The attached pro forma for the CSE Ph.D. projects a net loss in which the university would be required to subsidize the program in the following amounts: year 1 (-$33,740), year 3 (-$264,941), year 4 (-$174,394) and year 5 (-$224,394) [*year 2 is projected to have a surplus*]. Based on the successful track record of SEAS' previous grant activity and the assumptions communicated to the Managing Director of Finance, this presents a calculated financial risk which the University can absorb within its annual operating budget.

Annually, SEAS will provide key program data and information in a financial viability report to the board. This report will be used by the Office of the Chief Operating Officer to assess the fiscal integrity of the program.

Based on the information provided, the request to implement the Doctoral Program in Computer Science and Engineering in the School of Engineering & Applied Sciences has been approved.

Pro Forma - Doctoral Program in Computer Science & Engineering

Table 1: Expense and Revenue Distribution of Ph.D. Degree Program

	FALL-2018	FALL-2019	FALL-2020	FALL-2021	FALL-2022
Projected enrollment	5	10	15	20	20
Recurring Expenses					
Faculty (2)	$0	$0	$197,034	$197,034	$197,034
Adjuncts	$20,000	$24,000	$18,000	$18,000	$18,000
PhD Coordinator	$0	$0	$0	$0	$0
Program Asst	$16,500	$16,500	$42,000	$42,000	$42,000
Asst/ Fellowships	$90,000	$180,000	$270,000	$360,000	$360,000
Supplies & materials	$8,000	$10,000	$12,000	$15,000	$15,000
Library & IT	$5,000	$7,000	$8,000	$8,000	$8,000
Equipment	$50,000	$0	$50,000	$0	$50,000
Misc	$1,000	$1,000	$1,000	$1,000	$1,000
Total recurring	**$190,500**	**$238,500**	**$598,034**	**$641,034**	**$691,034**
Revenues					
Tuition	$0	$66,760	$133,520	$267,040	$267,040
Grant - TA	$90,000	$180,000	$0	$0	$0
Grant - Tuition	$66,760	$66,760	$199,600	$199,600	$199,600
Total revenue	$156,760	$313,520	$333,120	$466,640	$466,640
Surplus (or loss) by year	($33,740)	$75,020	($264,914)	($174,394)	($224,394)

Potential Revenue					
Grants	Award Amount based off of 50% Success Rate	Direct Award to SEAS Ph.D Program	Indirect Costs - 48%	Indirect Costs to SEAS - PHD Program - 5%	Total Amount for Ph.D Program
Existing Grants Applications (NSF,DoD,DOE,NIST,etc) - 3.4M	$1,700,000	$150,000	$816,000	$40,800	$190,800
New Grant Applications 8.5M	$4,500,000	$300,000	$2,160,000	$108,000	$408,000
Total	**$6,200,000**	**$450,000**	**$2,976,000**	**$148,800**	$598,800

FINANCIAL PLAN

DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE AND ENGINEERING

This financial plan has been prepared as a part of proposed Doctor of Philosophy (Ph.D.) in Computer Science and Engineering (CSE) program in the School of Engineering and Applied Science (SEAS) at the University of the District of Columbia. The Ph.D. program will advance the UDC as institution of higher learning not only by providing the advanced graduate studies through scholarship but also by producing graduates in the areas of nation's critical importance and great demand.

Below are two tables that illustrate the revenue and expenses for the new program AY 2018-19. ***Table 1*** presents the total incremental expenses and revenue for the next five academic years. The program is projected to start with $470K in initial seed funding from Army Research Office (ARO), Department of Defense (DoD)-Research and Educational Program for Historically Black Colleges, Universities, and Minority Serving Institutions Award grant. ***Table 2*** highlights the additional grants that SEAS projects it will secure and apply to the program in years 2020 – 2022 (highlighted in Table 2). SEAS has a 50% success rate on grants awarded over the past 3 years. **Based on this history, SEAS is projected to receive 6.2M in additional grant dollars over the life of the program and in turn, the university would be required to subsidize the program in the following amounts: year 1 (-$33,740), year 3 (-$264,941), year 4 (-$174,394) and year 5 (-$224,394).** Annually, SEAS will revisit our projections and provide a financial and academic viability report on the program.

Table 1: Expense and Revenue Distribution of Ph.D. Degree Program

	FALL-2018	FALL-2019	FALL-2020	FALL-2021	FALL-2022
Projected enrollment	5	10	15	20	20
Recurring Expenses					
Faculty (2)	$0	$0	$197,034	$197,034	$197,034
Adjuncts	$20,000	$24,000	$18,000	$18,000	$18,000
PhD Coordinator	$0	$0	$0	$0	$0
Program Asst	$16,500	$16,500	$42,000	$42,000	$42,000
Teach	$90,000	$180,000	$270,000	$360,000	$360,000
Supplies & materials	$8,000	$10,000	$12,000	$15,000	$15,000
Library & IT	$5,000	$7,000	$8,000	$8,000	$8,000
Equipment	$50,000	$0	$50,000	$0	$50,000
Misc	$1,000	$1,000	$1,000	$1,000	$1,000
Total recurring	**$190,500**	**$238,500**	**$598,034**	**$641,034**	**$691,034**
Revenues					
Tuition	$0	$66,760	$133,520	$267,040	$267,040
Grant - TA	$90,000	$180,000	$0	$0	$0
Grant - Tuition	$66,760	$66,760	$199,600	$199,600	$199,600
Total revenue	$156,760	$313,520	$333,120	$466,640	$466,640
Surplus (or loss) by	($33,740)	$75,020	($264,914)	($174,394)	($224,394)

Numbers in blue indicate projected grant dollars *Numbers in red reflect loss

Table 2: Potential Revenue from Grant Sources

Grants	Award Amount based off of 50% Success Rate	Direct Award to SEAS Ph.D Program	Indirect Costs - 48%	Indirect Costs to SEAS - PHD Program - 5%	Total Amount for Ph.D Program
Existing Grants Applications (NSF,DoD,DOE,NIST,etc) - 3.4M	$1,700,000	$150,000	$816,000	$40,800	$190,800
New Grant Applications 8.5M	$4,500,000	$300,000	$2,160,000	$108,000	$408,000
Total	$6,200,000	$450,000	$2,976,000	$148,800	$598,800

Justification of Expenses

PS (Faculty Salaries): Table 1. shows the number of new faculty members needed to maintain this program. Program implementation will begin with existing faculty members, however, there is a need for additional faculty members and staff support by the year four. The program will require a total of 2 additional faculty positions.

PS (Adjunct Faculty): Four adjunct faculty positions will be needed in 2018/19. This is necessary in order to address the anticipated needs of new courses. After that, three adjunct positions are anticipated every year. The teaching load distribution will be established by the Ph.D. Program Director in consultation with the Dean and the Chief Academic Officer.

PhD Program Director: A Ph.D. Program Director will be appointed immediately after the approval of this proposal. The Program Director will be in-charge of the coordination and the implementation of the program. In addition, the Program Director will be engaged in recruiting prospective students, managing the schedules, providing assistance in securing grants and contracts. While the Program Director will coordinate the research activities related to the Ph.D. program, he/she will coordinate with the department Chairs and the Dean regarding the research strategy. The PhD Program Director will receive course release for administrative services and summer support.

Program Administrative Assistant (Part time and Full time): The Ph.D. program will require the support of a full-time Program Administrative Assistant I ($42,000) per year starting with year 3. The job description of administrative staff support will be prepared soon after the approval. For the first two years, a reallocation administrative assistant from SEAS is proposed. The Administrative Assistant (full time or part time) will work under the supervision of the PhD Program director, Dean and CAO.

Teaching Assistants (Reallocation). For the first year, the cost of one student is $18,000 per year with an increase to $20,000 in the fifth year. The students with appropriate Master's Degrees and experience are eligible for teaching assistantships in their first year. They will teach undergraduate courses.

Graduate/Research Assistants: Faculty members are expected to have outside funding secured by the third year, in order to support graduate/research assistants. No anticipated monies from future grants have been used in the first two years in calculations for this proposal. The financial packages for domestic and international students will be established by a committee coordinated by the Ph.D. Program Director.

Supplies and Materials: Consumable supplies and materials in support of the program are estimated at $8,000 per year.

Library and IT Resources: Estimated library resources required to support the Ph.D. program is estimated at $5,000 per year. Equipment: We anticipate the purchase of equipment of $50K in the first year and $50K every alternate years. For example, a part of $50,000 will cover the maintenance cost of the nanotechnology application laboratory, class 1000 clean room and the new additive manufacturing facility. This investment will also provide the experimental resources to seek competitive federal grants in several million dollars range.
Other expenses will be for research seminars, dissertations and miscellaneous presentation expenses.

1. Potential Revenue

We project that the implementation of graduate program will increase the research grant activities and there will be potential revenue from additional indirect costs. We anticipate that the enrollment will increase gradually from the first year of implementation with 5 students and with an average annual increase of 5 students until year 4. By Year 4, the Ph.D. enrollment would be 20. We expect that half of the Ph.D. students will be from the Metropolitan DC region and half of the students are non-residents and the tuition revenues have been estimated accordingly. We anticipate graduating the first five Ph.D. students in 2021.

In this proposal, the recent revenue generated from college grant activity is shown in Appendix A. These grant activities will subsidize the doctoral program during the start-up period. In addition to grant funding, doctoral students will be leveraged via teaching assignment (adjuncts) of undergraduate courses.

2. Net Benefits

The proposed PhD graduate program is designed to meet the needs of aspiring engineering and computer science graduates, working professionals in the greater Washington DC Metropolitan area, and the nation. The proposed graduate program will:

- Provide UDC graduates a continuous path for obtaining advanced higher education opportunity in various sub-disciplines of computer science and engineering,
- Enhance the existing MSEE, MSME, MSCE, and all bachelor programs at SEAS.
- Provide opportunities for graduate students to assist faculty members in research and funded proposal activities,
- Enhance research capacity and productivity, and grant production,
- Provide opportunity for District residents to get education from associate level at UDC-CC to bachelors, masters and eventually leading to doctorate degree.
- Address the nations and Washington metropolitan region's need for highly specialized engineering and computer scientists in the high demand areas.

Explanation:

In the last 3 years SEAS enrollment has doubled. At this rate, we project that the continued enrollment increase will result in additional funding allocation. SEAS has been quite successful in securing federal and private grants over the past three years (2014 – 2017). The grant amounts have increased from approximately 300K in 2013 to 3M in 2017.

The PhD program will also provide opportunity to secure additional grant funding. The following NSF programs which are directly relevant to the Ph.D. programs will be pursued. More specifically, Graduate Research Fellowship Program (GRFP); CREST (1 million annually, 5 yr.); HBCU-RISE (2 million annually, 5 yr.); IGERT and a few other programs will be pursued. In addition, SEAS has already initiated contacts to secure funds from the US Army, RDECOM, DARPA, NIST, NIH, and NASA. Additional grants are focused on supporting full time graduate students for the PhD program

Appendix A

2016-2017 Grants for School of Engineering and Applied Sciences SEAS (2016-2017)

PROJECT TITLE	NEW/RENEWAL/ CNTNG	PRINCIPAL INVESTIGATOR	SCHOOL/ COLLEGE	TOTAL AWARD AMOUNT
Summer Undergraduate Research Fellowship (SURF) Gaithersburg Programs -NIST	New	Kate Klein	SEAS	$5,800
TIP: Course Development for a 21st Century Smart Grid Workforce (NSF)	New	Sasan Haghani, Wagdy Mahmoud and Pawan Tyagi	SEAS	$398,345
Consortium for Advanced Manufacturing: Applied Research and Workforce Development for High Power Density Electronic Devices Technology (DOE)	Continuing	Pawan Tyagi	SEAS	$250,000
LSAMP Modification # 6	Continuing	Briana Wellman	SEAS	$63511
RIA: An Intelligent Optimization Clustering and Classification Framework for High Dimensional Overlapped Classes and Imbalance Data (NSF)	New	Nian Zhang	SEAS	$199,999
Performance Data driven Methods and Tools for Computer Network Defense Through Network Science (DoD)	New	Paul Cotae	SEAS	$594,755
Integration, Cultivation and Exposure to Biomedical Engineering at the University of the District of Columbia (HBCU UP TIP-ICE_BME)- NSF	New	Lara Thompson	SEAS	$399,991
Summer Undergraduate Research Fellowship (SURF) NIST Gaithersburg Programs- NIST	New	Kate Klein	SEAS	$22,984
DDOE MOU	New	Pradeep Behera	SEAS	$35,000
PKAL Capital Region Network Workshop at the University of the District of Columbia, NSF	New	Lilly Liang	SEAS	$49,975
NASA MUREP/SEAP Scholarship (NASA)	New	Pawan Tyagi	SEAS	$11,801
Air Force Office of Sponsored Research Grant for major research equipment for additive manufacturing (DoD)	New	Dr. Xu and ME Department		$500,000

Advanced Technological Education (ATE) grant for Nanotechnology Education Workforce Development (NSF)	Extended	Dr. Klein and others		$200000
"EAGER: Nurturing Women's Innovativeness and Strength in Engineering through experiential learning in biomedical engineering (WISE)," NSF	New	Dr. Thompson		$100000
RIA: "Experimental and Multiscale Simulation Study of Nanoscale Thermal Transport and Evaporation/Boiling Heat Transfer using Self-assembled Nano emulsions," National Science Foundation	NEW	Dr. Xu		$300,000
RESEARCH INITIATION AWARD (RIA): Investigating a new Generation of Assistive, Innovative Technologies (GAIT) for balance rehabilitation. Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), National Science Foundation	New	Dr. Thompson		$299,996

Total: $3, 432,161.00 ($3.4M)

Appendix B, New Grant Applications since July 2017

July –Aug 2017

Two new grant proposals are being submitted this week,

1. Application to National Institute of Standards and Technology (NIST) totaling 7.5 million dollars (5yrs) under PREP program coordinated by Dr. Klein with participation from 11 faculty members (August 2017 submission)
2. Application to DOD totaling $1.5 million dollars. (August 2017 submission)