

**BOARD OF GOVERNORS
STATE UNIVERSITY SYSTEM OF FLORIDA
NEW DOCTORAL DEGREE PROPOSAL STAFF ANALYSIS**

Program: Ph.D. in Human-Centered Computing **CIP Code:** 11.0104
Institution: University of Florida **Proposed Implementation Date:** Fall 2016
Staffed By: Diana Barbu, Ph.D. **Initial Review Date:** 3/30/2016 **Last Update:** 4/19/2016

Projected program costs:

	Total	% & \$ Current Reallocated	% & \$ New Recurring	% & \$ New Non- Recurring	% & \$ C&G	Auxiliary Funds	Cost per FTE	2014-15 SUS Average Cost per FTE
Year 1	\$526,658	47.3% \$247,898	0% \$0	0% \$0	52.7% \$275,760	\$0	\$17,707	\$22,528 CIP 11*
Year 5	\$1,644,796	30.1% \$495,796	0% \$0	0% \$0	69.9% \$1,149,000	\$0	\$14,166	

* NOTE: The range of costs associated with the Average E&G Cost per FTE can vary considerably by university due to factors related to enrollment scale and diversity of programs in any particular CIP Code.

Projected FTE and Headcount are:

	Student Headcount	Student FTE
First Year	20	14
Second Year	20	14
Third Year	30	21
Fourth Year	40	28
Fifth Year	50	35

On March 29, 2007, the Florida Board of Governors approved Board Regulation 8.011, which sets forth criteria for implementation and authorization of new doctorates by the Board of Governors, as well as criteria for implementation and authorization of Bachelor's, Master's and Specialist degrees by Boards of Trustees. The following staff analysis is an assessment of how well the university meets Board Accountability and Readiness criteria for implementation of this degree program.

Proposal Page Numbers:

INTRODUCTION		ACCOUNTABILITY		READINESS				
Program Description	BOG Goals	Overall	Budget	Mission and Strength	Program Quality	Curriculum	Faculty	Resources
2	8	10	15	18	21	21	33	34

A. Program Description:

The University of Florida (UF) is proposing to offer a PhD in Human-Centered Computing (HCC) at its main campus. The program will focus on design, construction, and evaluation of computational technologies as they relate to the human condition and their impact on society. The purpose of the program is to train a new generation of computing researchers/developers that design, implement, and evaluate computing systems and technologies in real world or applied contexts. The proposal explains that the career paths for the graduates of this program include faculty members, research scientists, user experience designers, product and application developers, and usability engineers.

Staff research indicates that Human-Centered Computing “aims to bridge the existing gaps between the various disciplines involved with the design and implementation of computing systems that support human’s activities.” Additionally, Human-Centered Computing “facilitates the design of effective computer systems that take into account personal, social, and cultural aspects and addresses issues such as information design, human information interaction, human-computer interaction, human-human interaction, and the relationships between computing technology and art, social, and cultural issues” (Jaimes et al., 2007).

The PhD in Human-Centered Computing would be the first program to be offered by a Florida university and the fourth in the nation. The program will require the completion of 90 credit hours beyond a bachelor’s degree; up to 30 credit hours from a master’s degree can be transferred into the PhD program. The 90 credit hours required beyond a bachelor’s degree include 9 credits of core courses, 9 credits of restricted electives, 9 credits of cognate area electives, 45 to 48 credits of unrestricted electives, and 12 to 15 credits of dissertation and advanced research. In addition to coursework, students will be required to pass a qualifying examination, a dissertation proposal, and the dissertation defense.

B. System-Level Analysis and Evaluation in accordance with BOG Regulation 8.011:

The proposal does not explicitly reference a State University System (SUS) Strategic Plan. However, it notes that the program will increase the number of STEM graduates as well as facilitate interdisciplinary collaborations and expand funding sources.

Need Analysis

The Taulbee Survey is developed by the Computing Research Association and it provides data related to doctoral enrollments, degrees awarded, and employment outcomes for more than 200 North American academic departments of computer science, computer engineering, and related fields. The proposal notes that, according to the 2014 Taulbee Survey, the job placement rate for the 61 graduates of PhD in Human

Computer Interaction programs was 98% with only one graduate unemployed at the time of the survey. Board staff reviewed the 2015 Taulbee Survey and found that, although the number of degrees awarded decreased from 61 to 35, the percent of graduates employed increased from 98% to 100% from the 2014 to 2015 survey. The majority of graduates of these programs were most commonly employed in industry, followed by post-doctoral, tenure-track, researcher, government, and entrepreneurial positions.

The proposal includes five job advertisements for three faculty positions and two research scientist positions at different institutions across the country. Additionally, the proposal explains that “a search on EmployFlorida.com for web designer or graphic designer or usability yielded over 500 jobs in the state of Florida.” The same search has been repeated by staff and the results showed that a total of 482 (unduplicated) job openings have been advertised in the state of Florida. The educational requirements for many of these positions, however, did not include a doctoral credential. Moreover, when the same search was performed, but the educational requirement was set to doctoral degree, the number of openings decreased to zero. In other words, while plenty of job openings are advertised in areas related to “web designer or graphic designer or usability” in Florida, none of them require a doctoral credential.

Staff research shows that according to the Bureau of Labor Statistics and Florida’s Department of Economic Opportunity graduates of the Human-Centered Computing program could be employed in either one of the occupations listed in table A (please see below). However, due to entry-level educational requirements the graduates of the proposed PhD in Human-Centered Computing would most likely compete for the *Computer and Information Research Scientists* occupation. This occupation is projected to grow faster than the average at both state and national levels, with national growth projected at 11% between 2014 - 2024 and growth in Florida by 14% between 2015 - 2023. It should also be noted that graduates from other computer science and computer engineering disciplines can compete for either one of the occupations included in Table A.

Table A: Employment projections for occupations associated with CIP 11.0104 by educational level at the national and state level

Source	Occupations (for CIP 11.0104)	Projections	Entry-Level Education
BLS	Computer and Information Research Scientists	11%	Doctoral or Professional Degree
BLS	Software Developers	17%	Bachelor's Degree
DEO	Computer and Information Research Scientists	14%	Master's or Higher Degree
DEO	Software Developers, Applications	18%	Associate Degree
DEO	Software Developers, Systems Software	14%	Bachelor's Degree

Sources: * Bureau of Labor Statistics (BLS) employment projections from 2014 to 2024 as of 3/25/2016. The BLS national [average growth rate for all occupations](#) is 7%. ** Florida Department of Economic Opportunity (DEO) employment projections from 2015 to 2023 as of 3/25/2016. The DEO calculated average growth rate for all occupations in Florida is 11% (staff calculations).

A search for open academic positions in Human-Centered Computing conducted on March 28, 2016, by the Board staff revealed more than 80 faculty-related positions, such as chair, faculty, director, and instructor advertised through the www.insidehighered.com and the Chronicle of Higher Education websites. The majority of these positions require the completion of a PhD degree. These searches also revealed more than 350 staff position openings, some of which also required the completion of a doctorate degree.

Demand Analysis

The proposal notes that four faculty have been recruited from Clemson University to set up the PhD in Human-Centered Computing program at the University of Florida. These four faculty members brought with them a total of 12 graduate students who decided to continue their studies at UF in the proposed program. Plus, some of UF's current doctoral students are also expected to switch majors and enroll in the proposed program, once approved.

Additionally, according to the proposal, a total of 40 applications were submitted for UF's existing PhD in Computer Engineering. Six applicants out of 40 inquired about the Human-Centered Computing program at UF and two of the six were accepted into Georgia Tech's PhD in Human-Centered Computing program. The proposal notes that students from FIU, FAMU, other public and private universities in the state, graduates of other bachelor's and master's programs from a variety of disciplines, as well as UF's Bachelor in Computer Engineering graduates, will be recruited into the program. The proposal estimates that the Human-Centered Computing program will start with 20 PhD students and grow to 40-50 within five years.

Substantially Similar Programs

Currently, no other public or private university in the state of Florida offers similar programs.

Summary

The new program adds to the list of program offerings at UF and may enhance UF's competitiveness for students and research funding. Evidence exists that the number of human-centered computing job openings in the academic and non-academic arenas is increasing, so there should be a growing demand for graduates of the proposed program to fill faculty and research positions.

Dr. Rebecca Grinter, a Full Professor in the School of Interactive Computing in

the College of Computing at Georgia Tech reviewed the proposal as the external consultant. Dr. Grinter acknowledged that the proposed program's curriculum structure matches the curricula of the other similar programs offered by other universities. Dr. Grinter expressed support for the proposed program, noting that it would attract a diverse body of students into STEM and address fundamental research and workforce training needs.

C. Assessment of the University Review Process in accordance with BOG Regulation 8.011:

Due to the system of stair step accountability set in place by the Board of Governors in Regulation 8.011, it is now incumbent upon University Board of Trustees to verify that all doctoral programs coming before the Board of Governors have met the requirements of the regulation. The following is an assessment of the university review process to ensure that all criteria set forth have been considered by the university prior to submission to the Board of Governors office.

ACCOUNTABILITY

Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.

1. Overall - *The proposal is in the correct format, includes all necessary signatures, and contains complete and accurate tables for enrollment projections, faculty effort, and the proposed budget.*

YES NO

The proposal has been approved by the university board of trustees and includes all required signatures.

The University of Florida Board of Trustees approved the program on December 4, 2015.

The university has provided a proposal written in the standard SUS format which addresses new academic program approval criteria outlined in BOG Regulation 8.011.

The Board of Governors new degree proposal format is used, as expressed in the Board's Regulation 8.011.

The pre-proposal was reviewed by the Council of Academic Vice Presidents (CAVP) workgroup and any concerns identified by the group have been listed and addressed in the proposal.

The pre-proposal was presented to the CAVP group in February 2015 and there were no formal concerns noted.

The university has provided complete and accurate projected enrollment, faculty effort, and budget tables that are in alignment with each other.

The university provided adequate information on enrollment (Table 1-B),

budget (Table 2 & 3) and faculty effort (Table 4).

- The university has included a statement in the proposal signed by the equity officer as to how this proposal will meet the goals of the university's equity accountability plan.**
The program plan for achieving diversity has been reviewed and signed by the UF Equal Opportunity Officer on October 9, 2015.
- The program does not substantially duplicate programs at FAMU or FIU or, if it does, evidence was provided that consultations have occurred with the affected university on the impact of the new program on existing programs.**
The proposed program does not duplicate any program offerings at FIU or FAMU.

2. Budget - The proposal presents a complete and realistic budget for the program consistent with university and BOG policy, and shows that any redirection of funding will not have an unjustified negative impact on other needed programs.

YES NO

- The University Board of Trustees has approved the most recent budget for this proposal.**
The University of Florida Board of Trustees approved the program on December 4, 2015.
- The university has reviewed the budget for the program to ensure that it is complete and reasonable, and the budget appears in alignment with expenditures by similar programs at other SUS institutions.**
The estimated E&G cost per student FTE is projected to be \$17,707 in the first year and decrease to \$14,166 by the fifth year. The average 2014-2015 SUS E&G cost per student credit hour for doctoral level CIP 11 is \$704 for a total of \$22,528 per student FTE. Therefore, UF's projected E&G cost per student FTE seems to be slightly lower than the SUS average cost per student FTE.
- The proposal indicates that the program will follow the cost-recovery or market-rate funding models. If so, details and timelines for getting approvals for these funding models are included in the proposal.**
The program would follow the traditional E&G funding model.
- In the event that resources within the institution are redirected to support the new program, the university has identified this redirection and determined that it will not have a negative impact on undergraduate**

education, or the university has provided a reasonable explanation for any impact of this redirection.

The proposal notes that other programs will not be impacted by the implementation of this program. The proposal explains that the program can benefit undergraduate students by exposing them to research opportunities.

READINESS

Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.

3. Program Quality – *The proposal provides evidence that the university planning activities have been sufficient and responses to any recommendations to program reviews or accreditation activities in the discipline pertinent to the proposed program have been addressed.*

YES NO

 The university has followed a collaborative planning process for the proposed program in accordance with policies and procedures adopted by the University Board of Trustees.

 An external consultant has reviewed the proposal and supports the department's capability of successfully implementing this new program.
Dr. Rebecca Grinter, a Full Professor in the School of Interactive Computing in the College of Computing at Georgia Tech was invited to review the proposal as the external consultant. Dr. Grinter acknowledged that the proposed program's curriculum is in alignment with other similar programs offered by other universities. She expressed her support for the fact that the proposal focused also on policy, which received less attention in the existing programs. In closing, Dr. Grinter expressed support for the proposed program, noting that it would attract a diverse body of students into STEM and address fundamental research and workforce training needs.

 The university has found the level of progress that the department has made in implementing the recommendations from program reviews or accreditation activities in the discipline pertinent to the proposed program to be satisfactory.

According to the proposal, the Bachelor of Science in Computer Engineering program offered jointly by the Department of Electrical and Computer Engineering and the Department of Computer & Information Science & Engineering is accredited by the Accreditation Board for Engineering and Technology, Inc. (ABET). The most recent accreditation review occurred in 2012 and no deficiencies or weaknesses were noted in the review.

- The university has analyzed the feasibility of providing all or a portion of the proposed program through distance learning.**
The proposal notes that the program will be offered at UF's main campus.

4. Curriculum - The proposal provides evidence that the university has evaluated the proposed curriculum and found that it describes an appropriate and sequenced course of study, and that the university has evaluated the appropriateness of specialized accreditation for the program.

YES NO

- The university has reviewed the curriculum and found that the course of study presented is appropriate to meet specific learning outcomes and industry driven competencies discussed in the proposal.**
The proposed doctoral program is geared towards students who completed an undergraduate degree from an accredited institution, or equivalent, with a GPA of 3.3/4.0 or higher. The program will require the completion of 90 credit hours beyond a bachelor's degree. Up to 30 credit hours from a master's degree can be transferred into the PhD program.

- The university anticipates seeking accreditation for the proposed doctoral program, or provides a reasonable explanation as to why accreditation is not being sought.**
The proposal notes that the College is examining the appropriateness of pursuing Human Factors and Ergonomics Society (HFES) accreditation for this program.

5. Faculty - The proposal provides evidence that the university is prepared to ensure a critical mass of faculty will be available to initiate the program based on estimated enrollments, and that faculty in the aggregate have the necessary experience and research activity to sustain a doctoral program.

YES NO

- The university has reviewed the evidence provided and found that there is a critical mass of faculty available to initiate the program based on estimated enrollments.**
According to the proposal, 11 full-time faculty members will be directly involved in the new program. The university currently has 10 faculty members associated with the program and it intends to hire an additional one by the fall of 2016.

- The university has reviewed the evidence provided and found that the faculty in aggregate has the necessary experience and research activity to sustain the program.**

Table 4 shows that all the faculty members hold terminal degrees in their fields.

- The university has reviewed the evidence provided and found the academic unit(s) associated with this new degree to be productive in teaching, research, and service.**
 The proposal provides evidence of faculty productivity. Faculty members received numerous awards such as Fulbright Scholars (2), National Science Foundation Career Awards (12), IEEE Fellowships (4), etc. Additionally, the research expenditures of the 2012-13 academic year exceeded \$5.2 million.
- If appropriate, the university has committed to hiring additional faculty in later years, based on estimated enrollments.**
 The proposal mentions the need for hiring one additional faculty member to start in Fall 2016.

6. Resources – The proposal provides evidence that the university has ensured the available library volumes and serials; classroom, teaching laboratory, research laboratory, office space, equipment, clinical and internship sites, fellowships, scholarships, and graduate assistantships will be sufficient to initiate the program, and that if applicable, funding has been secured to make more resources available as students proceed through the program.

YES NO

- The university has provided a signed statement from the Library Director verifying that the library volumes and serials available are sufficient to initiate the program.**
- The university has ensured that the physical space necessary for the proposed program, including classrooms, laboratories and office space, is sufficient to initiate the program.**
 According to the proposal, instructional space is sufficient.
- The university has ensured that necessary equipment is available to initiate the program.**
 According to the proposal, all the necessary equipment is available.
- The university has ensured that fellowships, scholarships, and graduate assistantships are sufficient to initiate the program.**
 The proposal notes that most of the students in the program will receive assistantship and fellowship appointments. Education and General (E&G) and Contracts and Grants (C&G) are the main sources of funds for these appointments, as provided in table 2.

- If applicable, the university has ensured that the department has arranged a suitable number of clinical and internship sites.**

The proposal notes that relationships have been established with Intel, Harris Corporation, Nielson, and the Institute for Human Machine Cognition. Plus, some of these companies already awarded fellowships to and/or provided internships opportunities for the Human-Centered Computing students.

References

Jaimes, A., Gatica-Perez, D., Sebe, N., & Huang, T. S. (2007). Guest Editors' Introduction: Human-Centered Computing – Toward a Human Revolution. *Computer*, (5), 30-34.