Program Planning Summary
Clemson University

Ph.D. in Human Centered Computing

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Human Centered Computing PhD Degree
Program Planning Summary

Designation
New Graduate Program Proposal, 60 credit hours above the baccalaureate

Proposed Date of Implementation
August 2011

Justification for need for the proposed program
Human Centered Computing (HCC) is a relatively new discipline that solves real world problems through the integration of computing with people, technology, information, policy and sometimes culture. HCC researchers design and build computing artifacts and evaluate them through studies with human subjects. In some cases, HCC researchers connect computing artifacts with policy. HCC researchers are needed in industry and the academy. In industry, there is a need for people that can evaluate computing systems for their usability and recently, there's a need for researchers that can actually build systems as well. In the academy, Schools of Information, (also known as iSchools, see http://www.ischools.org), are ideal places for our graduates, in addition to library sciences, information sciences, business schools, etc. There are computer science programs that are implementing human-computer interaction and HCC. Our graduates will be great fits for these programs as well.

Anticipated program demand and productivity
There are only 2 other HCC PhD degree programs in the nation (Georgia Tech and University of Maryland Baltimore County). The demand for HCC training at the PhD level within the HCC Division in the School of Computing is on the rise. Currently there are at least 12 PhD students enrolled in the School of Computing that would serve as the first HCC PhDs. The School of Computing is receiving applications each semester for HCC research. After 3 years of the program's existence, we expect to produce 2 HCC PhD graduates per year for the next 4 years and then 3-5 PhD graduates per year.

Assessment of extent to which the proposed program duplicates existing programs in the state
There are only 2 other Human Centered Computing PhD degree programs in the nation (Georgia Tech and University of Maryland Baltimore County). There are no other programs within South Carolina.

Relationship of the proposed program to existing programs at the proposing institution
The HCC PhD degree program is an interdisciplinary degree that has a computing core. The program borrows from several disciplines across Clemson University. The students will take classes from the following disciplines: Computing, Psychology, Industrial Engineering, Policy Studies, Rhetorics, Communication and Information Design, Education,

Mathematics, Statistics and other disciplines. HCC PhD students will take classes from some of these areas depending on their areas of interest.

Relationship of the proposed program to other institutions via interinstitutional cooperation
There are no interinstitutional cooperations at this time.

Total new costs associated with implementing the proposed program
The HCC PhD degree borrows from multiple disciplines across campus; therefore, there are no new costs associated with the proposed degree.

Preliminary Human Centered Computing PhD Courses

Students will be required to have a strong computing or computation core with training in areas that emphasize people or the human condition and research methods for studying people, technology, policy and information. Each student will be required to take a first course in the fundamentals of HCC for 3 hours. Students are required to take 12 hours in the computing or computer science track from 600 or 800 level computer science courses, 6 hours from a people or human condition track consisting of courses from psychology, human factors, policy, etc., and 6 hours of research methods. Students are required take a series of at least 9 hours in a cognate or specialty domain under the advisement of their dissertation research advisor with the approval of the HCC graduate program committee. The students are also required to take 6 hours of pre-dissertation (pre-portfolio) research, CPSC 888 Directed Projects in Computing. The students will also take 18 hours of dissertation research (CPSC 991).

- ☐ Computing (School of Computing) – 12 hours from 600 and 800 level courses

- ☐ HCC fundamentals – 3 hours

- ☐ People - 6 hours
  - CP SC 612 Eye Tracking Methodology and Applications
  - CP SC 614 Human Computer Interaction
  - AP EC 822 Contemporary Public Policy
  - PO ST 822 Policy Analysis and Political Choice
  - PO ST 842 Ethics and Public Policy
  - PO ST 843 Organization Theory and Public Management
  - HIST 691 Studies in the History of Science and Technology
  - THRD 613 Contemporary Technological Problems
  - PSYCH 823 PERCEPTION, COGNITION AND TECHNOLOGY
  - PSYCH 833 ADVANCED COGNITIVE PSYCHOLOGY
  - PSYCH 835 ADVANCED HUMAN FACTORS PSYCHOLOGY
  - PSYCH 837 Ergonomics for Applied Psychology
  - IE 800 Human Factors Engineering
  - IE 801 Design / Analysis of Human Machine Systems
  - IE 802 Design of Human Computer Systems

- IE 893 Human Factors in Healthcare
- RCID 805: Rhetorics, Communication, and Information Technologies
- RCID 811: Perspectives in Information Designs

☐ Research Methods & Design (EX ST 801, etc) - 6 hours
- EX ST 801 Statistical Methods I
- EX ST 805 Experimental Design II
- EX ST 803 Regression and Least Squares Analysis
- PSYCH 810 RESEARCH DESIGN AND QUANTITATIVE METHODS I
- PSYCH 811 RESEARCH DESIGN AND QUANTITATIVE METHODS II
- PSYCH 813 RESEARCH DESIGN AND QUANTITATIVE METHODS III
- SOC 803 Survey Designs for Applied Social Research
- ED F 778 Experimental and Nonexperimental Research Methods in Education
- ED L 855 Applied Research and Evaluation in higher Education
- RCID 802: Cultural Research Methods
- RCID 803: Empirical Research Methods
- MTHSC 600: Theory of Probability
- MTHSC 603: Introduction to Statistical Theory
- MTHSC 605: Statistical Theory and Methods II

☐ Sample Cognate Areas – 9 hours
- Public Policy
  - PO ST 822 Policy Analysis and Political Choice
  - PO ST 842 Ethics and Public Policy
  - PO ST 843 Organization Theory and Public Management
- Human Factors
  - IE 800 Human Factors Engineering
  - IE 801 Design / Analysis of Human Machine Systems
  - IE 802 Design of Human Computer Systems
  - IE 893 Human Factors in Healthcare
- Education and Learning (TBD)