New Proposal for Graduate Certificate in Computer Science Education

The Graduate Certificate in Computer Science Education prepares teachers for integrating computational thinking across the curriculum and teaching computer science courses in order to address the critical shortage of qualified computer science educators. When the White House identified this as a national priority, The College Board responded by creating the AP Computer Science Principles, and the Computer Science Teachers Association (CSTA) revised its standards accordingly. The National Science Foundation (NSF) provided funding for creating curriculum based on the new standards, and the maker movement provided creative ways for students to visualize and demonstrate what they are learning. By earning this Certificate, educators become knowledgeable about the new standards, materials, and methods for teaching computer science and integrating computational thinking across the curriculum. Project-based assessment, hands-on workshops, and classroom-based activities immerse candidates in effective practices that could be applied in their local settings.

**Background**

This proposal results from collaboration between the School of Education (SOE) and the Department of Computer and Information Sciences (CIS) in order to address the critical shortage of computer science educators. In 2016, President Obama addressed this shortage in his State of the Union address. When the White House made this a national priority, NSF provided funding to address it. Here at UD, Professors Pollock, Mouza, Atlas, Harvey, and Hofstetter participated in these NSF projects, among others. Pollock and Mouza encouraged the State of Delaware to follow the lead of other states in making computer science a requirement. In 2017, Governor John Carney signed into law Delaware House Bill 15, which mandates that all public high schools, including charter schools, must offer at least one computer science course at the high school level by the 2020-2021 school year. Further, in 2017 the Delaware Department of Education adopted computer science standards for grades K-12, making it necessary for teachers to implement pedagogical practices that integrate computer science across disciplinary content (e.g., in math, literacy, etc.). By establishing this Graduate Certificate in Computer Science Education, the University of Delaware will create our state’s first pathway for Delaware teachers to be recognized as being formally prepared for teaching these courses.

**List only New Courses that are being currently submitted for this program:\***

The Graduate Certificate in Computer Science Education requires satisfactory completion of four 3-credit courses for a total of 12 credits. Of these four courses, two are existing courses already residing in the School of Education, and the other two are new courses being created by the Department of Computer and Information Sciences (CIS). Both of the new courses have been submitted to the Faculty Senate’s new course creation process. The new course numbers and titles are listed as follows:

CISC 605: Computer Science Principles

CISC 606: Foundations in Programming

Note: These are new courses that have been submitted to the Faculty Senate’s new course creation process.