Notice of Intent to Define an Undergraduate Certificate for Computer Science Education

Developed by Faculty in the School of Teacher Education (College of Education) and Department of Computer Science (College of Engineering and Applied Science)

A. Name: **Computer Science Education Undergraduate Certificate**. Mode of delivery: Distance Education and Classroom

B. Description:

The proposed Computer Science Education Undergraduate Certificate program packages currently offered courses from the Computer Science department in the College of Engineering and Applied Sciences with a methods course from the School of Teacher Education in the College of Education. The certificate will allow in service teachers the opportunity to obtain the coursework necessary for a computer science teaching endorsement in Wyoming.

Anticipated Curriculum:

COSC 1010: Introduction to Computer Science I (4)

COSC 1030: Computer Science I (4)

COSC 2030: Computer Science II (4)

COSC 2150: Computer Organization (3)

COSC 3050: Ethics for the Computer Professional (1)

COSC 3100: Computer Science Education Seminar (2)

EDSE 4280: Methods: Computer Science (2)

Total Credits: 20

Learning Outcomes:

The following learning outcomes are based on the International Society for

Technology in Education (ISTE) standards for Computer Science Educators.

- Demonstrate knowledge of and proficiency in data representation and abstraction
- Effectively design, develop, and test algorithms
- Demonstrate knowledge of digital devices, systems, and networks
- Demonstrate an understanding of the role computer science plays and its impact in the modern world
- Plan and teach computer science lessons/units using effective and engaging practices and methodologies

- Design environments that promote effective teaching and learning in computer science classrooms and online learning environments and promote digital citizenship
- Participate in, promote, and model ongoing professional development and lifelong learning relative to computer science and computer science education

C. Information about content and how relates to other programs

The Computer Science Education Undergraduate Certificate is based on the Computer Science Endorsement program offered at the undergraduate level as an add-on endorsement for undergraduate Secondary Math and Science Education candidates. There are 18 credits of computer science courses and a 2 credit education methods course. Students currently enrolled in a major program at the University of Wyoming would earn a minor in Computer Science in addition to the certificate. All the courses in the program are currently being taught on site and most are already offered online through the Wyoming community colleges. Sections of the three upper level courses will be offered online from the University of Wyoming beginning in the 2019 fall semester.

D. Plan for market analysis and plan for eval and analysis of post-graduation employment

The Computer Science Education Undergraduate Certificate is intended to be a pathway for teachers to gain the credentials needed to teach computer science in Wyoming K-12 schools. As more constituents continue to back K-12 computing education, we expect that Wyoming will experience a growing need for certified and qualified teachers.

E. Preliminary budget

Very few resources will be needed. All the courses are already being offered in the Computer Science department and the School of Teacher Education. The only additional resource is the conversion of three courses to online delivery.

F. Timeline

Campus and Board review will take place starting during the fall 2018 and continuing through the spring 2019 semester. Pending program approval, students would be able to enroll in the certificate program starting the fall semester of 2019.

G. Accreditation

The courses in the program map to the International Society for Technology in Education (ISTE) standards for Computer Science educators. ISTE is the Council for the Accreditation of Educator Preparation (CAEP) recognized Specialized Professional Association (SPA) in this area.

H. Alignment with mission, strategic plan, existing academic degree programs

Making the computer science courses that are included in the Computer Science Education Undergraduate Certificate Program accessible to classroom teachers in Wyoming assists in meeting the UW Strategic Plan Goal 3: Impacting Communities. This goal, which is articulated as "Improve and enhance the health and well-being of our communities and environments through outreach programs and in collaboration with our constituents and partners" is particularly relevant as the program will allow for collaboration with K-12 Wyoming schools to support the emerging problem of providing updated and rigorous computer science education to all students.

I. Rationale that defines need and evidence of non-duplication

The proposed certificate program will be an important piece of the pipeline for endorsing computer science teachers in Wyoming K-12 schools. This is an important issue for the state, and having the certificate will help in service teachers to add the computer science endorsement. The courses in the program are also used in the existing computer science endorsement program, but that is only available to students who are undergraduates at the University of Wyoming, so it effectively locks out teachers who are currently teaching in Wyoming high schools. The proposed certificate program will allow the university to reach those teachers and help them earn their endorsement so they can offer computer science courses in addition to the other courses they are currently teaching, e.g., math, science, or business.

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