

COMPUTER SCIENCE EDUCATION, MS

Department of Computer Science and Department of Teacher Education, College of Information Science & Technology and College of Education

Vision Statement

This degree program is intended for those with a passion for the teaching and learning of computational thinking, computer science, and information technology skills. By developing both content knowledge and pedagogical skills related to the computing disciplines, this program is ideal for educators looking to empower young people to become the creators of next generation technologies. In completing program coursework, certified Nebraska teachers will also meet requirements for the IT Supplemental Endorsement.

Program Contact Information

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Program Website (<http://www.unomaha.edu/college-of-information-science-and-technology/computer-science-education/graduate/ms-csed.php>)

Other Program Related Information

Students who hold current Nebraska teaching certification are eligible for the IT Supplemental endorsement upon successfully completing the 15 hour core courses.

Admissions

Application Deadlines

- Fall: July 1
- Spring: December 1
- Summer: April 1

Program-Specific Requirements

- UNO College of Education's Personal and Professional Fitness Form
- Copy of your current teacher certification (if applicable)
- Professional Resume or Curriculum Vitae
- Statement of Purpose addressing the following:
 - Describe your academic and professional journey. Discuss your background personal and professional experiences, and your current educational context. Be sure to explain your motivation for pursuing this program at this point in your career.
 - In order to advise you on initial coursework, please describe any prior formal or informal training you have completed in computing, computer science, and information technology. This includes, but is not limited to programming/coding, web design, systems administration, computing networking, databases, and computer applications.
 - Discuss your post-master's degree plans. How will the MS in computer science education contribute to your future endeavors related to P-12 students, educators, administrators or other community stakeholders.

- International students who do not intend to teach in the U.S. may be eligible for admission. Applicants are required to have a command of oral and written English. Those who do not hold a baccalaureate or other advanced degree from the U.S., **OR** a baccalaureate or other advanced degree from a pre-determined country on the waiver list, must meet the minimum language proficiency score requirement in order to be considered for admission.
 - 550 for the written TOEFL
 - 80 for the internet-based TOEFL
 - 6.5 on the IELTS
 - 53 PTE

Code	Title	Credits
Required Core Courses		15
TED 8006	SPECIAL METHODS IN THE CONTENT AREA	3
CSTE 8020	EXPLORING COMPUTER SCIENCE FOR TEACHERS	3
or CSTE 8030	COMPUTER SCIENCE PRINCIPLES FOR TEACHERS	
CSTE 8040	OBJECT ORIENTED PROGRAMMING FOR TEACHERS	3
CSCI 8366	FOUNDATIONS OF INFORMATION ASSURANCE	3
or CYBR 8366	FOUNDATIONS OF INFORMATION ASSURANCE	
CSCI 8836	INTRODUCTION SOFTWARE ENGINEERING	3
or CSCI 8256	HUMAN COMPUTER INTERACTION	
Required Extension Courses		6
CSCI 8010	FOUNDATIONS OF COMPUTER SCIENCE	3
TED 8050	DATA-DRIVEN DECISION MAKING FOR EDUCATORS	3
or TED 8860	INVENTION & INNOVATION IN ENGINEERING EDUCATION	
Electives		3-6
The following courses are considered standing electives that have already been approved for all students. Students may request a course not listed here be counted as an elective in writing to the GPC. Such requests should be made prior to enrolling in the course.		
CSCI 8XXX - All graduate computer science courses not counted elsewhere in the plan of study.		
CSTE 8XXX - All graduate CS Education courses not counted elsewhere on the plan of study.		
CSTE 8920	SEMINAR IN CS EDUCATION: SPECIAL TOPICS	
MTCH 8040	TOPICS IN MATHEMATICAL COMPUTING	
STEM/TED 8420	TRENDS AND TEACHING STRATEGIES IN SCIENCE EDUCATION	
STEM/TED 8430	SCHOOL CURRICULUM PLANNING	
STEM/BIOL 8450	BIOLOGY EDUCATION RESEARCH METHODS	
STEM/TED 8840	ENGINEERING EDUCATION EXTERNSHIP	
TED 8540	DIGITAL CITIZENSHIP	
TED 8550	TECHNOLOGY FOR CREATIVE AND CRITICAL THINKING	
TED 8050 or TED 8860 can also be used as electives if not used as extension coursework.		
Exit Requirement		3-6
Thesis Option ¹		6
CSTE 8990	THESIS	
Project Option ²		6

CSTE 8960	THESIS EQUIVALENT PROJECT IN CS EDUCATION	
Capstone ³		3
CSTE 8910	CAPSTONE IN CS EDUCATION	
Total Credits		30

- ¹ Thesis credits must be completed over two or more academic terms.
- ² Project credits must be completed over two or more academic terms.
- ³ The Capstone course may only be taken upon completion of at least 21 credit hours in the program.

- Computer Science Education Certificate (<http://catalog.unomaha.edu/graduate/degree-programs-certificates-minors/computer-science-education/computer-science-education-certificate>)

CSTE 8020 EXPLORING COMPUTER SCIENCE FOR TEACHERS (3 credits)

This course provides a breadth first introduction to computer science for pre-service and in-service teachers. The Exploring Computer Science curriculum (<http://www.exploringcs.org>) serves as a guiding framework for this course, which introduces domain knowledge and appropriate teaching techniques related to teaching human computer interaction, computational problem solving, web design, programming, data analysis, and robotics in school environments. In addition the course covers ethical and social issues in computing along with an overview of computing careers.

CSTE 8030 COMPUTER SCIENCE PRINCIPLES FOR TEACHERS (3 credits)

This course introduces pre-service and in-service teachers to the foundational principles of computer science. It aims to help them learn the essential thought processes used by computer scientists to solve problems, expressing those solutions as computer programs. It prepares them to teach the CS Principles course (<http://www.apcsprinciples.org>) proposed by the College Board and the National Science Foundation as a new AP course in Computer Science. The exercises and projects make use of mobile devices and other emerging platforms.

Prerequisite(s)/Corequisite(s): MATH 1310 or MATH 1220 (or equivalent)

CSTE 8040 OBJECT ORIENTED PROGRAMMING FOR TEACHERS (3 credits)

This course provides an in-depth treatment of the fundamentals of object-oriented programming (OOP) in Java programming language environment. Topics include data types and information representation, control structures, classes and objects, methods, encapsulation, inheritance and polymorphism, and use of introductory data structures to solve real-world problems. Additionally, this course interleaves coverage of OOP content with discussion of common learner misconceptions and teaching strategies/tools that can be employed to aid learners' mastery of this material. This course prepares students to implement the Advanced Placement Computer Science A curriculum in a secondary school setting.

Prerequisite(s)/Corequisite(s): CSTE 8020 or CSTE 8030.

CSTE 8910 CAPSTONE IN CS EDUCATION (3 credits)

This course will allow graduate students, as an individual or as part of a group, to study and analyze specific problems related to teaching computing in schools. Projects will be concerned with the curriculum and/or instruction of computing and should address a broad scope of application rather than a specific level.

Prerequisite(s)/Corequisite(s): The student must have completed at least 21 credit hours in the Masters of CS Education program.

CSTE 8920 SEMINAR IN CS EDUCATION: SPECIAL TOPICS (1-3 credits)

This course will cover variable content focusing on CS education topics relevant to PK-12 teachers and based on current research trends. New curricula, tools, assessments, programming languages, or related standards may be covered.

Prerequisite(s)/Corequisite(s): Advisor and/or instructor approval.

CSTE 8960 THESIS EQUIVALENT PROJECT IN CS EDUCATION (1-6 credits)

This course allows a graduate student to conduct a research project in computing education. The process for development and approval of the project must include: appointment of supervisory committee (chaired by project adviser), a proposal approved by the supervisory committee, monitoring of the project by the supervisory committee, an oral examination over the completed written product conducted by the supervisory committee, & final approval by the supervisory committee. The approved written project will be submitted to the Office of Graduate Studies by the advertised deadlines. Project credits must be completed over two or more academic terms.

Prerequisite(s)/Corequisite(s): Completion of required Core courses and approval of advisor.

CSTE 8970 CS ED INDEPENDENT STUDY (1-3 credits)

This is a specially designed course taken under the supervision of a graduate faculty member to accommodate the student who has identified a focus of study not currently available in the departmental offerings and who has demonstrated capability for working independently.

Prerequisite(s)/Corequisite(s): Permission of the department and graduate faculty member.

CSTE 8990 THESIS (1-6 credits)

This course is an independent research project completed under the direction of a thesis advisor and required of all candidates pursuing a Master of Science with Thesis option. Thesis credits must be completed over two or more academic terms.

Prerequisite(s)/Corequisite(s): Completion of Required Core Courses and approval of advisor. Not open to non-degree graduate students.