COMPUTER SCIENCE EDUCATION, MS

Department of Computer Science and Department of Teacher Education, College of Information Science and 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
Dr. Brian Dorn, Graduate Program Chair
Peter Kiewit Institute (PKI) 174E
402-554-4905
bdorn@unomaha.edu

Leslie Planos, Advisor
Peter Kiewit Institute (PKI) 176C
402-554-3819
lplanos@unomaha.edu

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.
  • Finally 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.
  • 550 for the written TOEFL
  • 213 for the computer-based TOEFL
  • 80 for the internet-based TOEFL
  • 6.5 on the IELTS
  • 53 PTE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TED 8006</td>
<td>SPECIAL METHODS IN THE CONTENT AREA</td>
<td>3</td>
</tr>
<tr>
<td>CSTE 8020</td>
<td>EXPLORING COMPUTER SCIENCE FOR TEACHERS</td>
<td>3</td>
</tr>
<tr>
<td>or CSTE 8030</td>
<td>COMPUTER SCIENCE PRINCIPLES FOR TEACHERS</td>
<td></td>
</tr>
<tr>
<td>CSTE 8040</td>
<td>OBJECT ORIENTED PROGRAMMING FOR TEACHERS</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 8366</td>
<td>FOUNDATIONS OF INFORMATION ASSURANCE</td>
<td>3</td>
</tr>
<tr>
<td>or CYBR 8366</td>
<td>FOUNDATIONS OF INFORMATION ASSURANCE</td>
<td></td>
</tr>
<tr>
<td>CSCI 8836</td>
<td>INTRODUCTION SOFTWARE ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>or CSCI 8256</td>
<td>HUMAN COMPUTER INTERACTION</td>
<td></td>
</tr>
</tbody>
</table>

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
Select 3-6 hours of graduate coursework in consultation with your advisor

Exit Requirement 3-6

<table>
<thead>
<tr>
<th>Thesis Option 1</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEB 8990</td>
<td>THESIS</td>
</tr>
</tbody>
</table>

Project Option 2

| Course in consultation with advisor as the course that has been identified has not yet been approved. | 6 |

Capstone 3

| Course in consultation with advisor as the course that has been identified has not yet been approved. | 3 |

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 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 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.