COMPUTATIONAL LINGUISTICS, ANALYTICS, SEARCH AND INFORMATICS - MASTER OF SCIENCE (MS)

This is a unique interdisciplinary degree that provides a solid foundation in both computer science and linguistics graduate coursework as well as several courses focused on data-driven linguistics, computational linguistics and information processing. The training is aimed at preparing students for careers in areas such as predictive text messaging, search engines, question-answering, interactive virtual agents and machine translation.

Distance Education Option

Students can take individual courses toward a master’s degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

Due to the hands-on learning experience, some courses must be taken on campus. This is a hybrid program.

Requirements

Students must complete at least 32 hours of approved graduate study, including a 2-credit capstone course focused on a publishable research project, which will run in conjunction with an internship or a CU-based research project. As part of the capstone, students will be evaluated by their employer or industry project manager. Students will also prepare a technical report on the completed project that the program directors and project leader will jointly evaluate. A minimum course grade is a B and a minimum GPA for graduation is 3.0.

To fulfill core requirements defined below, students must take graduate breadth courses in 3 different breadth bins. This includes core computer science (bins 1 and 3) and core CLASIC (bin 2).

Required Courses and Credits

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>Core Linguistics Courses</td>
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Choose two of the following:

- LING 5030 Linguistic Phonetics
- LING 5420 Morphology and Syntax
- LING 6450 Syntactic Analysis
- LING 5430 Semantics and Pragmatics

Choose one:

- Any LING course at the 5000-, 6000- or 7000-level (subject to advisor approval)

Core Computer Science Courses

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<th>Code</th>
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<tr>
<td>Bin 1 (choose one)</td>
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Recommendations:

- CSCI 5454 Design and Analysis of Algorithms
- or CSCI 5444 Introduction to Theory of Computation
- or CSCI 5714 Formal Languages
- CSCI 5060 Principles of Numerical Computation

Bin 3 (choose one)

Recommended options:

- CSCI 5253 Datacenter Scale Computing - Methods, Systems and Techniques
- CSCI 5448 Object-Oriented Analysis and Design
- CSCI 5535 Fundamental Concepts of Programming Languages

CLASIC Capstone

- LING/CSCI 5140 CLASIC Capstone 2

Core CLASIC Courses

- CSCI/LING 5832 Natural Language Processing (Required for everyone. Satisfies Bin 2 requirement) 3

Choose two of the following:

- CSCI 7000/LING 7800 Current Topics in Computer Science (Topics: Computational Lexical Semantics or Computational Models of Discourse) 3

CSCI/LING 7565 Computational Phonology and Morphology 3

Choose two of the following:

- CSCI 5352 Network Analysis and Modeling
- CSCI 5502 Data Mining
- CSCI 5622 Machine Learning
- CSCI 5922 Neural Networks and Deep Learning
- CSCI 6622 Advanced Machine Learning
- CSCI 7000 Current Topics in Computer Science (Inference, Models & Simulation for Complex Systems)
- CSCI 7222 Topics in Nonsymbolic Artificial Intelligence (Probabilistic Models of Human & Machine Intelligence)
- CSCI 7222 Topics in Nonsymbolic Artificial Intelligence (Representation Learning for Language)
- LING 5200 Introduction to Computational Corpus Linguistics
- LING 5800 Open Topics in Linguistics (Machine Learning and Linguistics)
- LING 6300/3800 Topics in Language Use (Formal Models of Linguistics)
- LING 6520 Topics in Comparative Linguistics (Computational Grammars)
- PHIL 5440 Topics in Logic
- PHIL 5460 Modal Logic

Any other CSCI or LING course at the 5000-, 6000- or 7000-level

Any Core course listed above (not already taken)

Total Credit Hours 32

Visit the computer science department website (http://www.colorado.edu/cs/current-students/graduate-students/graduate-breadth-courses/) for a full list of course options in each of the 3 breadth bins. (Updated every two years.)
Learning Outcomes
The program is intended to:

• Provide a solid foundation in computer science, data-driven linguistics and natural language processing graduate coursework.
• Educate graduates to be specialists in the application of computers to the processing of natural languages, such as English, Chinese, Arabic and Urdu.
• Prepare students for jobs in the field of computational linguistics, also known as text analytics, natural language processing and informatics, a field critical to the success of mainstream global businesses who compete for employees qualified to address these needs.