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.

Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s):

- Applied Computer Science - Post-Baccalaureate Bachelor of Science (BSACS) (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/applied-computer-science-post-baccalaureate-bachelor-science-bsacs/#acceleratedmasterstext)
- Computer Science - Bachelor of Arts (BA) (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-bachelor-arts-ba/#acceleratedmasterstext)
- Computer Science - Bachelor of Science (BSCS) (https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-bachelor-science-bscs/#acceleratedmasterstext)
- Linguistics - Bachelor of Arts (BA) (https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/linguistics/linguistics-bachelor-arts-ba/#acceleratedmasterstext)

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 a 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

Code	Title	Credit Hours
Core Linguistics Courses		**9**
Choose two of the following:		
LING 5030	Linguistic Phonetics	
LING 5420	Morphology and Syntax	
or 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		**6**
Bin 1 (choose one) [1]		
Recommended options:		
CSCI 5454	Design and Analysis of Algorithms	
or CSCI 5444	Introduction to Theory of Computation	
or CSCI 5714	Formal Languages	
CSCI 5606	Principles of Numerical Computation	
or CSCI 5646	Numerical Linear Algebra	
Bin 3 (choose one) [1]		
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:		6
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**

[1] 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.