Joint major in
Linguistics & Computer Science
2019-20

The major in Linguistics & Computer Science allows students to explore human (natural) language from a variety of perspectives, through courses focusing on meaning and linguistic structure at a variety of levels (sounds, words, sentences), with a range of electives in other areas. Students also learn about the organization, design, and construction of hardware and software systems for computing, and discover how such systems can be programmed to process and analyze large amounts of natural language data.

This prepares students for a variety of career opportunities in Computational Linguistics and Natural Language Processing, including improving or developing new software in areas such as grammar checkers, machine translation, and information retrieval. It also provides an excellent background for students who wish to pursue graduate studies in these areas.

All students entering CAS as first-year students in Fall 2018 and after will pursue coursework in the BU Hub, a general education program that is integrated into the entire undergraduate experience. BU Hub requirements are flexible and can be satisfied in many different ways, through coursework in and beyond the major and, in some cases, through co-curricular activities. Students in the Linguistics and Computer Science joint major can fulfill up to 12 of their 26 Hub units through the 15 courses that satisfy requirements for the major; these are primarily in the areas of Scientific & Social Inquiry; Quantitative Reasoning; Diversity, Civic Engagement & Global Citizenship; and Critical Thinking. For details, see http://www.bu.edu/linguistics/UG/hub/lx-cs-hub.html. Remaining BU Hub requirements will be satisfied through selections from a wide range of available courses outside the major or, in some cases, co-curricular experiences.

The academic program consists of a total of 15 4-credit courses in Linguistics and Computer Science, including at least one course in Computational Linguistics and Natural Language Processing, all completed with a grade of C or higher. Students are also expected to be comfortable with standard high school mathematics as well as calculus at a level equivalent to completion of CAS MA 123.

Participating faculty

Linguistics
Carol Neidle, Professor & Chair, Linguistics Department
Jonathan Barnes, Associate Professor
Charles Chang, Assistant Professor
Elizabeth Coppock, Assistant Professor
Daniel Erker, Associate Professor
Paul Hagstrom, Associate Professor
Neil Myler, Assistant Professor
Alexander Nikolaev, Assistant Professor

Computer Science
Margrit Betke, Professor
Mark Crovella, Professor
Alina Ene, Assistant Professor
Dora Erdos, Lecturer
Lorenzo Orrechia, Assistant Professor
Kate Saenko, Associate Professor
Stan Sclaroff, Professor and Dean of CAS
Wayne Snyder, Associate Professor
Derry Wijaya, Assistant Professor

Course Requirements

Six courses in Linguistics

- CAS LX 250 Introduction to Linguistics
- CAS LX 301 Phonetics & Phonology: Introduction to Sound Systems
- CAS LX 321 Syntax: Introduction to Sentential Structure
- CAS LX 331 Semantics & Pragmatics: Introduction to Linguistic Meaning
- Two additional CAS LX courses at or above the 300 level

Seven courses in Computer Science

- CAS CS 111 Introduction to Computer Science 1
- CAS CS 112 Introduction to Computer Science 2
- CAS CS 131 Combinatoric Structures
- CAS CS 132 Geometric Algorithms
- CAS CS 210 Computer Systems
- CAS CS 237 Probability in Computing
- CAS CS 330 Introduction to Analysis of Algorithms
One additional course in Computer Science or Linguistics, from the following options:

- CAS CS 542 Machine Learning
- One CAS LX course at the 400-level

One course in Computational Linguistics or Natural Language Processing, from the following:

- CAS LX 496 Introduction to Computational Linguistics
- CAS CS 505 Introduction to Natural Language Processing (approval pending)

CAS credit towards the joint major will not be given for Metropolitan College (MET) courses.

Learning Outcomes

Students will achieve:

- An understanding of the fundamental questions that drive modern linguistic research, along with foundational knowledge in the core areas of linguistic theory.
- The ability to identify and describe with precision the empirical patterns found in sets of language data, and to construct well-reasoned linguistic analyses by formulating, testing, and refining hypotheses about these patterns.
- The ability to understand and evaluate the organization, design, and construction of hardware and software systems for computing.
- The ability to analyze problems that require computation to answer, and to design and implement appropriate problem solutions that are efficient and effective.
- The ability to use computational tools, particularly those involving statistical and machine-learning techniques, for language-related applications.

Honors in the major

Students with a sufficient GPA overall (at least 3.65) and in the major (at least 3.7) and who have already completed at least 2 of the required Linguistics courses and 2 of the required courses in Computer Science can apply to participate in the Honors program, which involves one additional advanced course in Linguistics, Computer Science, or Computational Linguistics/Natural Language Processing, chosen in consultation with the student’s advisor, plus one semester of Senior Honors Research. See the Linguistics Program website for details. Applications will be accepted no sooner than the end of sophomore year and no later than the beginning of the second semester of the junior year. Students are expected to begin discussions with faculty advisors about the Honors Research project by March of their junior year, and are required to submit an approved proposal by May 15 of their junior year. To graduate with honors in the major, the student will need a GPA of 3.7 in the 16 major courses and a grade of at least A- on the honors project.

Application Form

Can be downloaded from: <http://www.bu.edu/linguistics/UG/j-m/honors-application-l-and-cs.pdf>; it should be submitted to the Linguistics Department, room 120, 621 Commonwealth Ave.

Co-curricular Activities

Honors students will meet at least several times a semester. Activities may include colloquia, presentations, question-and-answer sessions, and panel discussions with faculty. We will maintain an email list and inform honors students of other events (both at BU and in the Boston area) that may be of interest in relation to Linguistics and Computer Science. Honors students will also be included in the activities associated with the Linguistics Department and Computer Science Department honors programs.

For more information, see

- http://ling.bu.edu/degrees/Linguistics-and-CS
- http://ling.bu.edu
- http://www.bu.edu/cs/