The minor in Digital Studies of Language, Culture, and History introduces students to computer programming and the use of cutting-edge software tools for representing, exploring, analyzing, and publishing the products of human language and culture. These products range from everyday speech and writing to historical documents and literary texts, and they encompass music and art as well as mundane objects, places, and institutions. The courses in this minor will help students not just to understand and use digital tools but to see digital computing as a cultural activity in its own right—an activity to be studied with respect to its historical development, social setting, cultural impact, and aesthetic qualities, as well as the ethical problems it creates in our increasingly digitized and networked world. This minor does not require a background in mathematics or computing but is designed for students who are majoring in the humanities or humanistic social sciences. It will also be of interest to students majoring in the sciences who want to acquire programming skills in the context of linguistic, cultural, and historical studies.

MINOR IN DIGITAL STUDIES OF LANGUAGE, CULTURE, AND HISTORY

Students must take six courses to complete the minor in Digital Studies of Language, Culture, and History. They break down as follows:

1. One course in computer programming. Students are encouraged to take DIGS 20001 Introduction to Computer Programming, but the following are acceptable substitutes: CMSC 12100 Computer Science with Applications I, CMSC 15100 Introduction to Computer Science I, CMSC 16100 Honors Introduction to Computer Science I.

2. One course in statistics. Students are encouraged to take STAT 22000 Statistical Methods and Applications, which is offered every quarter. Alternatively, they may take DIGS 20002 Data Analysis for the Humanities I, which is offered in the Autumn Quarter.

3. One course in data analysis using the R programming environment: DIGS 20004 Data Analysis for the Humanities II. This course has the prerequisites of DIGS 20001 and DIGS 20002 (or equivalent courses in computer programming and statistics).

4. One of the following three courses:
   - DIGS 20003 Data Management for the Humanities (Autumn)
   - DIGS 20005 Data Publication for the Humanities (Winter)
   - DIGS 20006 Natural Language Processing (Spring)

   Note that each of these courses has a prerequisite of DIGS 20001 (or an equivalent introduction to computer programming), and DIGS 20006 also requires DIGS 20002 (or an equivalent introduction to statistics).

5. A required seminar course: DIGS 20007 Introduction to Digital Humanities

6. One elective course approved by the faculty director of the Digital Studies of Language, Culture, and History program. This will normally be a course in the humanities or social sciences that entails computational methods or explores the history and cultural significance of digital media or of computation in general. Suitable courses are offered in several different departments and programs.

Note that the particular courses on offer will vary from year to year and some courses may have prerequisites. Examples of potentially suitable courses include:

- CMST 25204 Media Ecology: Embodiment & Software
- CMST 27110 Digital Cinema
- CMST 27815 Introduction to Art, Technology, and Media
- CMST 27920 Virtual Reality Production
- ENGL 25980 Technorelations: Intimacy, Bodies, Machines
- ENGL 25990 Always Already New - Printed Books & Electronic Texts
- GEOG 20500 Introduction to Spatial Data Science
- GEOG 28201 Intro to Geographic Information Systems
- HIPS 25205 Computers, Minds, Intelligence & Data
- HIST 25415 History of Information
- HIST 25425 Censorship, Info Control, & Revolutions in Info Technology from the Printing Press to the Internet
- HIST 29523 Data History: Information Overload from the Enlightenment to Google
- LING 28600 Computational Linguistics
### Digital Studies of Language, Culture, and History Courses

#### DIGS 20001. Introduction to Computer Programming, 100 Units.

This course provides an introduction to computer programming and computational concepts using the Python programming language. It is a prerequisite for the other Digital Studies core courses (students who are already experts in Python may request an exemption from taking this course, subject to the approval of the Director of Digital Studies). The Spring Quarter version of this course is open to all undergraduate and graduate students; however, students doing the undergraduate Minor or the joint BA/MA in Digital Studies are given priority in enrollment. An equivalent but accelerated course (DIGS 30000) is offered in the September term for incoming students in the one-year Digital Studies MA program.

Equivalent Course(s): DIGS 30001

#### DIGS 20002. Data Analysis for the Humanities I, 100 Units.

This course provides an introduction to statistics and computational data analysis with emphasis on linguistic, cultural, and historical data. Programming exercises in Python will help students build on what they learned in DIGS 20001/30000/30001. Digital Studies MA students who have taken the University of Chicago course STAT 22000 or an equivalent statistics course may request an exemption from taking this course, subject to the approval of the Director of Digital Studies.

Terms Offered: Autumn

Prerequisite(s): DIGS 20001/30000/30001, “Introduction to Computer Programming” (or equivalent expertise in Python)

Equivalent Course(s): DIGS 30002

#### DIGS 20003. Data Management for the Humanities, 100 Units.

This course introduces concepts and techniques related to the representation and management of digital data, with emphasis on the forms of data encountered in linguistic, cultural, and historical research. Topics covered include: (1) digital text encoding using the Unicode and XML standards, with attention to the TEI-XML tagging scheme of the Text Encoding Initiative; (2) digital typefaces (‘fonts’) for displaying encoded characters; (3) digital encoding of 2D images, 3D models, sound, and video; (4) database models and querying languages, both relational and non-relational, with attention to methods for integrating and querying semi-structured and heterogeneous data; (5) ontologies, the Semantic Web, and related technical standards; and (6) cartographic concepts (e.g., coordinate systems and map projections) and the basics of geospatial data management using Geographic Information Systems.

Terms Offered: Autumn
Prerequisite(s): DIGS 20001/30000/30001, “Introduction to Computer Programming” (or an equivalent course in computer programming)
Equivalent Course(s): DIGS 30003

DIGS 20004. Data Analysis for the Humanities II. 100 Units.
This course builds on DIGS 20002/30002, ‘Data Analysis for the Humanities I’ by introducing students to the R language and R packages for data analysis. Topics covered include data mining, data visualization, and high-performance computing techniques for analyzing large datasets. This course provides a high-level conceptual introduction to machine learning, social network analysis, and spatial data analysis. The goal is to make students familiar with these methods and aware of their role in linguistic, cultural, and historical studies, as a basis for further study of these methods.
Terms Offered: Winter
Prerequisite(s): DIGS 20001/30000/30001, “Introduction to Computer Programming” (or an equivalent course in computer programming) and DIGS 20002/30002, “Data Analysis for the Humanities I” (or an equivalent statistics course)
Equivalent Course(s): DIGS 30004

DIGS 20005. Data Publication for the Humanities. 100 Units.
This course introduces software techniques and tools for building Web browser apps written in HTML5, CSS, and JavaScript with emphasis on user interfaces for presenting information to researchers and students in the humanities. Topics covered include: (1) the use of application programming interfaces (APIs) to integrate into Web apps the various analysis, visualization, and database services provided by external systems; (2) the transformation of data into formats appropriate for publication on the Web; and (3) the use of persistent identifiers for reliable citation of published data and the problems of archiving and preserving scholarly data.
Terms Offered: Winter
Prerequisite(s): DIGS 20001/30000/30001, “Introduction to Computer Programming” (or an equivalent course in computer programming)
Equivalent Course(s): DIGS 30005

DIGS 20006. Natural Language Processing. 100 Units.
This course introduces software techniques and tools for natural language processing (NLP) using Python. Topics covered include a review of character-string processing and NLP methods for part-of-speech tagging, lemmatization, morphological segmentation, sentence splitting, named entity recognition, co-reference resolution, sentiment analysis, and topic modeling. This course also provides a high-level conceptual overview of recent work in machine translation via neural networks and deep learning.
Terms Offered: Spring
Prerequisite(s): DIGS 20001/30000/30001, “Introduction to Computer Programming” (or equivalent expertise in Python) and DIGS 20002/30002, “Data Analysis for the Humanities I” (or an equivalent statistics course)
Equivalent Course(s): DIGS 30006

DIGS 20007. Introduction to Digital Humanities. 100 Units.
This course is a discussion-oriented seminar that introduces students to theoretical debates in digital humanities, broadly defined, with attention to underlying philosophical issues. It touches upon the history and theory of digital computing within its social and institutional settings, as well as the history of the application of digital computing to texts, images, sound, geospatial data, and other information relevant to cultural and historical studies. Among other topics, this course introduces students to debates about the cultural impact of digital media and about ethical issues related to the ownership, accessibility, and legitimate uses of digital data.
Terms Offered: Autumn
Prerequisite(s): DIGS 20001/30000/30001, “Introduction to Computer Programming” (or an equivalent course in computer programming)
Equivalent Course(s): DIGS 30007

DIGS 20015. Musical Robotics. 100 Units.
Musical Robotics is a skills and discussion-based class for students interested in learning analog and digital electronics to build robotic musical instruments or sound art installations. Discussions will be organized around readings related to art and technology with a special focus on sound-based works. Students will learn to program Arduinos to control DC motors, solenoids, and servos with music applications like Logic Pro and Max/MSP. As a final project students will present a new instrument they’ve created or plans for an art installation featuring a kinetic sculpture element.
Instructor(s): Bryan Jacobs Terms Offered: Autumn
Prerequisite(s): For this advanced course, a background in low-level, functional, or graphical (Max/MSP, PD) computer programming is assumed. It is also assumed that students have done some work to develop musical ideas or worked towards developing an aesthetic perspective.
Equivalent Course(s): DIGS 30015, MUSI 26720, MAAD 26720, MUSI 36620