Digital Studies of Language, Culture, and History

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 These products range from everyday speech and writing to historical documents and literary texts, and they encompass music and art as well as mundane objects, places, and institutions.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. Students who take CMSC 15100 or CMSC 16100 are expected to learn the Python language on their own before taking the Digital Studies courses listed below. A course in computer programming is a prerequisite for the other Digital Studies courses and must be taken before the student’s fourth year (or before taking DIGS 20002, DIGS 20004, DIGS 20005, or DIGS 20006).

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. DIGS 20002 has as a prerequisite DIGS 20001 or an equivalent introduction to computer programming. A course in statistics is a prerequisite for DIGS 20004 and DIGS 20006 and must be taken before the student’s fourth year (or before taking DIGS 20004 and DIGS 20006). Note that STAT 20000 Elementary Statistics does not fulfill this requirement.

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 DIGS 20005 and DIGS 20006 (but not DIGS 20003) have as a prerequisite DIGS 20001 or an equivalent introduction to computer programming, and DIGS 20006 also requires DIGS 20002 or an equivalent introduction to statistics. Students who have taken courses in computer programming and/or statistics to fulfill the requirements of their major(s), other minors, or general education requirements cannot double count those courses to reduce the number of courses required for the Digital Studies minor. In that case, they will take an additional course from the list above in lieu of DIGS 20001, if they have taken an equivalent programming course for another program. Likewise, they will take an additional course from the list above in lieu of DIGS 20002, if they have taken an equivalent statistics course for another program.

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

6. One elective course in the humanities or humanistic social sciences that has a digital component, broadly defined, and has been approved by the Director of Digital Studies. Students who wish to use their elective slot to do their own digital project and create a software product for their portfolio may do so by means of a DIGS independent study course that will count as their elective.

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 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
MUSI 26618 Electronic Music: Composing with Sound

**SUMMARY OF REQUIREMENTS FOR THE MINOR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
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<tbody>
<tr>
<td>DIGS 20001</td>
<td>Introduction to Computer Programming</td>
<td>100</td>
</tr>
<tr>
<td>or CMSC 12100</td>
<td>Computer Science with Applications</td>
<td></td>
</tr>
<tr>
<td>or CMSC 15100</td>
<td>Introduction to Computer Science I</td>
<td></td>
</tr>
<tr>
<td>or CMSC 16100</td>
<td>Honors Introduction to Computer Science I</td>
<td></td>
</tr>
<tr>
<td>DIGS 20002</td>
<td>Data Analysis for the Humanities I</td>
<td>100</td>
</tr>
<tr>
<td>or STAT 22000</td>
<td>Statistical Methods and Applications</td>
<td></td>
</tr>
<tr>
<td>DIGS 20004</td>
<td>Data Analysis for the Humanities II</td>
<td>100</td>
</tr>
<tr>
<td>One of the following three courses:</td>
<td></td>
<td></td>
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<tr>
<td>DIGS 20003</td>
<td>Data Management for the Humanities</td>
<td>100</td>
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<tr>
<td>or DIGS 20005</td>
<td>Data Publication for the Humanities</td>
<td></td>
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<tr>
<td>or DIGS 20006</td>
<td>Natural Language Processing</td>
<td></td>
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<tr>
<td>DIGS 20007</td>
<td>Introduction to Digital Humanities</td>
<td>100</td>
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<tr>
<td>One elective, approved by the faculty director</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Total Units</td>
<td>600</td>
<td></td>
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**ADVISORY AND GRADING**

Courses in the minor may not be double counted with the student’s major(s), other minors, or general education requirements. Courses in the minor must be taken for quality grades, and more than half of the requirements for the minor must be met by registering for courses bearing University of Chicago course numbers.

Students who elect the minor must meet with the academic director before the end of Spring Quarter of their third year to declare their intention to complete the minor. The director’s approval for the minor program should be submitted to a student’s College adviser by the deadline above using the Consent to Complete a Minor Program (https://humanities-web.s3.us-east-2.amazonaws.com/college-prod/s3fs-public/documents/Consent_Minor_Program.pdf) form.

**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 many of 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 textbook for this course is Think Python (second edition) by Allen B. Downey, which is available online, free of charge. 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 September for incoming students in the one-year Digital Studies MA program.

Terms Offered: Spring Summer. DIGS 20001/30001 is offered every Spring Quarter as a full-length course and in Summer as an intensive three-week course in the September term. 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. Topics covered include probability, distributions, and statistical inference, as well as linear regression and logistic regression. Students will learn how to use Python libraries for statistics and plotting within Jupyter Notebooks. The textbook for this course is OpenIntro Statistics, which is available online, free of charge. 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. Prerequisite: DIGS 20001/30000/30001, “Introduction to Computer Programming” (or equivalent expertise in Python).

Terms Offered: Autumn
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 the humanities. 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 (especially SQL for relational databases and SPARQL for non-relational RDF-graph databases), with attention to methods for integrating and querying the kinds of semi-structured and heterogeneous data characteristic of the humanities; (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. This course has no prerequisite; i.e., prior knowledge of computer programming is not required.

Terms Offered: Autumn
Prerequisite(s): Digs 20001/30000/30001, "Introduction to Computer Programming" (or an equivalent course in computer programming)
Equivalent Course(s): Digs 30002

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 30003

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
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Equivalent Course(s): DIGS 30007