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 These products range from everyday speech and writing to historical documents and literary texts, and they encompass music and art as well as mundane objects, places, and institutions.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 that provides a broad survey of computing in the humanities:** DIGS 20007 Introduction to Digital Humanities, which is offered annually in the Autumn Quarter.

2. **One course in computer programming.** Either DIGS 20001 Introduction to Computer Programming, which is offered annually in the Autumn Quarter; or one of the following courses offered by the Department of Computer Science: CMSC 12100 Computer Science with Applications I, CMSC 14100 Introduction to Computer Science I, CMSC 15100 Introduction to Computer Science I, or CMSC 16100 Honors Introduction to Computer Science I. Note that CMSC 12100, 15100, and 16100 will no longer be offered as of the academic year 2022–2023 and CMSC 14100 will henceforth be the introductory course offered by the Department of Computer Science.

3. **One course in data analysis:** Either STAT 22000 Statistical Methods and Applications, which is offered every quarter, or DIGS 20002 Data Analysis for the Humanities I, which is offered annually in the Autumn Quarter. Note that STAT 20000 Elementary Statistics does not fulfill this requirement, although STAT courses that are more advanced than STAT 22000 would do so.

4. **One course in data management:** DIGS 20003 Data Management for the Humanities, which is offered annually in the Winter Quarter.

5. **One of the following courses:**
   - DIGS 20004 Data Analysis for the Humanities II (Winter)
   - DIGS 20005 Data Publication for the Humanities (Spring)
   - DIGS 20006 Data Analysis for the Humanities III: Deep Learning (Spring)
   - DIGS 20031 Digital Texts I: Opening New Paths for Textual Scholarship (Winter)
   - DIGS 20032 Digital Texts II (Spring; not offered every year)

   Note that DIGS 20004, DIGS 20005, and DIGS 20006 each have as a prerequisite DIGS 20001 or an equivalent introduction to computer programming. Note that DIGS 20004 and DIGS 20006 also have as a prerequisite DIGS 20002 or an equivalent introduction to statistics.

   Note that students who have taken courses in computer programming and/or statistics to fulfill the requirements of their major(s) or other minor(s), or to fulfill the 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 additional DIGS course(s) from the list above in lieu of DIGS 20001 and/or DIGS 20002.

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
Digital Studies of Language, Culture, and History

ENGL 25980 Technorelations: Intimacy, Bodies, Machines
ENGL 25990 Always Already New - Printed Books & Electronic Texts
GEOG 20500
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

Digs 20001. Introduction to Computer Programming. 100 Units.
or CMSC 12100. Computer Science with Applications I
or CMSC 14100. Introduction to Computer Science I
or CMSC 15100. Introduction to Computer Science I
or CMSC 16100. Honors Introduction to Computer Science I

Digs 20002. Data Analysis for the Humanities I. 100 Units.
or STAT 22000. Statistical Methods and Applications

Digs 20003. Data Management for the Humanities. 100 Units

Digs 20004. Data Analysis for the Humanities II. 100 Units.
or Digs 20005. Data Publication for the Humanities
or Digs 20006. Data Analysis for the Humanities III: Deep Learning
or Digs 20031. Digital Texts I: Opening New Paths for Textual Scholarship
or Digs 20032. Digital Texts II

Digs 20007. Introduction to Digital Humanities. 100 Units.
One elective, approved by the faculty director. 100 Units.

Total Units: 600

Advising 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 10000. Approaches to Digital Humanities Using Python. 100 Units.
This course introduces students to (1) current work in digital humanities with examples of the software applications being used and the computational research being done in literary, historical, linguistic, and cultural studies; and (2) the principles and practices of computer programming using the Python programming language. (Taught remotely via Zoom in the Summer Session; undergraduate only.)
Instructor(s): Clovis Gladstone Terms Offered: Summer

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.
Instructor(s): Clovis Gladstone Terms Offered: Autumn
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.

Terms Offered: Autumn
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 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 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 visualization, textual analysis, social network analysis, geospatial data analysis, and high-performance computing (HPC) techniques for analyzing large datasets. 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. Data Analysis for the Humanities III: Deep Learning. 100 Units.
This course focuses on applications of deep neural networks and machine learning ("deep learning") in the humanities. Topics covered include AI-assisted natural language processing (NLP) and machine translation, audio analysis (e.g., speech recognition and musical analysis), image analysis (computer vision), and the philosophical issues raised by artificial intelligence and especially non-symbolic (second-wave) AI based on deep learning.

Terms Offered: Spring
Prerequisite(s): DIGS 20001/30001, “Introduction to Computer Programming” (or an equivalent course in computer programming), and DIGS 20002/30002, “Data Analysis for the Humanities I” (or an equivalent course in statistics).
 Equivalent Course(s): DIGS 30006

DIGS 20007. Introduction to Digital Humanities. 100 Units.
This course surveys the history and theory of digital computing, the use of computers in the humanities, and recent debates in digital humanities. Topics discussed include the impact of digital media in modern culture, the philosophical questions raised by artificial intelligence (AI), and the ethical dilemmas created by the pervasive use of software. This course has no prerequisite; i.e., prior knowledge of computer programming is not required.
 Instructor(s): David Schloen Terms Offered: Autumn
 Equivalent Course(s): DIGS 30007

DIGS 20020. Digital Imaging and Modeling in Archaeology. 100 Units.
3D technology has transformed the way we interact with ancient artifacts and archaeological sites, from initial documentation to public outreach. This course will provide an overview of the various digital recording technologies available and will explore how they can be used for analysis, map making, creating virtual museums, and replicating ancient objects for public outreach and education. Participants will learn how to use
photogrammetry to transform archaeological sites and artifacts into 3D models and 3D-printed objects. We will cover data collection using both cameras and drones, data processing, digital inking in Photoshop, 3D model export, online presentation, 3D printing and model painting. We will also consider the ways in which digital tools can be used to for public outreach, education, and to make archaeology more equitable and accessible. The course will provide valuable training to students interested in archaeology, artifact studies, conservation, museum collections, and digital humanities.

Instructor(s): Douglas Inglis Terms Offered: Spring
Equivalent Course(s): NEAA 30352, DIGS 30020, NEAA 20352

DIGS 20031. Digital Texts I: Opening New Paths for Textual Scholarship. 100 Units.

The purpose of this course is to introduce students in the humanities to digital methodologies for the study of text. Students will not only learn how to construct a digital text collection, but also how to process text as data. Among the various digital approaches which will be introduced in class are concordances (retrieving occurrences of words), semantic similarity detection (finding similar passages across texts), sentiment analysis, or stylometry (analysis of literary style). The course will highlight how these approaches to text can provide new avenues of research, such as tracing intellectual influence over the longue durée, or uncovering the distinguishing stylistic features of an author, work, or literary movement. Students need no prior knowledge of such methods, and the course will aim at providing both the basics of computer programming in Python and to give students the necessary tooling to conduct a digital humanities project. The source material for the course will be drawn from literary sources, and students will be free (and encouraged) to use texts which are relevant to their own research interests. Students will need to bring a laptop to class.

Instructor(s): Gladstone, Clovis Terms Offered: Winter
Equivalent Course(s): RLLT 34550, RLLT 24550, DIGS 30031

DIGS 20032. Digital Texts II. 100 Units.

This course is designed to expose students who already have experience in Python programming and text processing to more advanced computational approaches to text analysis. Over the course of the quarter, students will learn how to leverage existing Python libraries to extract the morphological structure from texts, they will become adept at building, analyzing, and refining their own machine-learning models using a variety of preprocessing and feature engineering methods. We will be covering clustering methods such as topic modeling, as well as different supervised learning or word embedding approaches. Our class content will be supplemented by readings which highlight the uses of these computational methods in current academic research. The source material for the course will be drawn from literary and/or media resources, and students will be free (and encouraged) to use texts which are relevant to their own research interests. At the end of the course, students will be expected to produce their own digital project using some of the methods covered in class. Students will need to bring a laptop to class.

Instructor(s): Gladstone, Clovis Terms Offered: Spring
Prerequisite(s): DIGS 20031/30031; Digital Texts I DIGS 20001/30001: Intro to Computer Programming (or an equivalent course)
Note(s): Prerequisites may be waived by permission of the instructor for students who have sufficient background in the subject.
Equivalent Course(s): RLLT 20032, DIGS 30032, RLLT 30032

DIGS 23517. Introduction to Critical Spatial Media: Visualizing Urban, Environmental, and Planetary Change. 100 Units.

This course introduces critical theories and techniques for visualizing interconnected transformations of urban, environmental, and planetary systems amidst the pressures of climate change, urbanization, and global economies of capitalism. Weekly lectures will introduce major themes and theoretical debates, paired with hands-on lab tutorials exploring a selection of methods in conventional and experimental geographic visualization. Thematically, the course will be organized around critical interpretations of the Anthropocene, a concept designating the epoch in which anthropogenic activities are recognized as the dominant force of planetary climatic and ecological change. We will present these interpretations through modules structured around different conceptual paradigms and alternative epochal designations (e.g. the Urbanocene, the Capitalocene, the Plantationocene). Through weekly lab exercises and a final, synthetic project, the course will move from critically analyzing prevalent theoretical frameworks, geospatial data, and associated visualization techniques to creatively visualizing critical alternatives. Students will learn how to construct visual narratives through a variety of spatial media (e.g. maps, diagrams, visual timelines), scales (e.g. bodies, neighborhoods, landscapes, the planetary), and techniques/platforms (e.g. GIS, web mapping, basic programming language tools, and vector/raster visualization programs).

Instructor(s): Alexander Arroyo, Grga Basic Terms Offered: Spring
Equivalent Course(s): ARCH 23517, MAAD 13517, ENST 23517, ARTV 20665

DIGS 28980. There’s an App for That: Religion in the Digital Age. 100 Units.

Can you sit shiva (a Jewish mourning ritual) via Facetime? Is Christian communion really communion if the wafer is made of pixels? Can religious communities experience a feeling of sacred togetherness if its members only get together online? How does online worship change the kinds of religious people we are or may become? This course explores such questions and others that arise out of the relationship between religion and digital media. We will read theories about religious ritual; religion, space, and place; and religion and embodiment to think through what happens when religion leaves the material sphere and "goes online." We will partner
these theories with scholarly reflections on how one is able to study religion on the internet, attending to some of the many conceptual, logistical, and ethical issues that arise when we do. Once we have a grasp of scholarly reflections on digital religion, we will put them into conversation with data from apps, blogs, websites, digital games, streaming events, and online message boards to test their ideas and to ask and answer our own questions. In keeping with the themes of the course, our final assignment will be the creation of a collaborative digital project. There are no prerequisites for this course and no background in Religious Studies or digital technology is required.

Instructor(s): Emily D. Crews Terms Offered: Winter
Equivalent Course(s): GLST 28980, RLST 28980