Digital Studies of Language, Culture, and History

Department Website: https://digitalstudies.uchicago.edu

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 These products range from everyday speech and writing to historical documents and literary texts, and they encompass music and art as well as mundane objects, places, and institutions.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. *Either* DIGS 20001 Introduction to Computer Programming Using Python, 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.

2. One course in data analysis: *Either* STAT 22000 Statistical Methods and Applications, which is offered every quarter, *or* DIGS 20002 Introduction to Statistics Using Python, 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.

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

4. One course in data publication: DIGS 20005 Data Publication for the Humanities, which is offered annually in the Spring Quarter.

5. One of the following courses:

- DIGS 20004 Data Visualization for the Humanities (Autumn)
- DIGS 20007 History and Theory of Computing for the Humanities (Winter)
- DIGS 20031 Digital Texts I: Corpus Building and Corpus Statistics (Winter)
- DIGS 20032 Digital Texts II: Natural Language Processing and Deep Learning (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 also has 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

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 Sound Practices: Composing with Sound

Summary of Requirements for the Minor

DIGS 20001	Introduction to Computer Programming Using Python	100
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	Introduction to Statistics Using Python	100
or STAT 22000	Statistical Methods and Applications	
DIGS 20003	Data Management for the Humanities	100
DIGS 20005	Data Publication for the Humanities	100
DIGS 20004	Data Visualization for the Humanities	100
or DIGS 20007	History and Theory of Computing for the Humanities	
or DIGS 20031	Digital Texts I: Corpus Building and Corpus Statistics	
or DIGS 20032	Digital Texts II: Natural Language Processing and Deep Learning	
One elective, approved by the faculty director		100
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
Equivalent Course(s): DIGS 30000

DIGS 20001. Introduction to Computer Programming Using Python. 100 Units.
This course provides an introduction to computer programming and computational concepts using the Python programming language. Students are also introduced to the use of Visual Studio Code as an industry-standard source code editor. This course is a prerequisite for most of the other Digital Studies (DIGS) courses. Students enrolled in one of the Digital Studies programs (MA, joint BA/MA, undergraduate minor, or graduate certificate) who have previously passed an equivalent college-level course in computer programming with a grade of B (3.0) or higher may petition the Associate Director of Curriculum and Instruction of the Forum for Digital Culture for an exemption from taking this course and permission to take an additional elective course instead.
Instructor(s): Clovis Gladstone Terms Offered: Autumn
Equivalent Course(s): DIGS 30001

DIGS 20002. Introduction to Statistics Using Python. 100 Units.
This course provides an introduction to statistics and computational data analysis using Python and Jupyter Notebook. It is a prerequisite for "Data Analysis II: Data Visualization and Machine Learning" (DIGS 20004/30004) in the Winter Quarter. Topics covered include probability, distributions, and statistical inference, as well as linear regression and logistic regression. Students will gain additional practice in Python coding

and will learn how to use Python libraries for statistics and plotting. The textbook for this course is OpenIntro Statistics, which is available online, free of charge. Students enrolled in one of the Digital Studies programs (MA, joint BA/MA, undergraduate minor, or graduate certificate) who have previously passed an equivalent college-level course in statistics with a grade of B (3.0) or higher may petition the Associate Director of Curriculum and Instruction of the Forum for Digital Culture for an exemption from taking this course and permission to take an additional elective course instead.
Instructor(s): Brooke Luetgert 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.
Instructor(s): Miller Prosser Terms Offered: Autumn
Equivalent Course(s): DIGS 30003

DIGS 20004. Data Visualization for the Humanities. 100 Units.
This course introduces best practices for visualizing data sets to assist the study of human languages, cultures, and history. Python-based tools will be used to create data visualizations, enhancing familiarity with that programming language. The emphasis will be on displaying data in a clear and elegant manner that is appropriate for the type of information we wish to showcase. Students will learn exploratory and explanatory data visualization techniques both to analyze the data and to communicate ideas via data-based storytelling. Possible biases in the way data is presented will be noted so students can learn to guard against them. Examples of data sets derived from research in the humanities will be used to develop creative and technical skills to produce standard 2D and 3D plots for descriptive summaries of the data, to identify outliers, and to do statistical correlations and model predictions that reveal underlying trends and potential anomalies. Social network analysis (a method widely used in the humanities and social sciences) will also be introduced, as well as tools for data visualization using geographical maps and timelines. Prerequisites: DIGS 20001/30001, "Introduction to Computer Programming Using Python," or an equivalent course in computer programming and DIGS 20002/30002, "Introduction to Statistics Using Python," or an equivalent course in statistics.
Instructor(s): Brooke Luetgert Terms Offered: Winter
Prerequisite(s): DIGS 20001/30001, “Introduction to Computer Programming with Python” (or an equivalent course in computer programming) and DIGS 20002/30002, “Data Analysis I: Introduction to Statistics” (or an equivalent course in statistics).
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. Students will take an active role in evaluating approaches and outcomes of existing digital publications. 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 nature of data in the humanities as pertains to digital publication.
Instructor(s): Miller Prosser Terms Offered: Spring
Prerequisite(s): DIGS 20001/30001, “Introduction to Computer Programming with Python” (or an equivalent course in computer programming).
Equivalent Course(s): DIGS 30005

DIGS 20006. Artificial Intelligence and the Humanities. 100 Units.
In this course we will look at forms of artificial intelligence (AI) from the perspective of the humanities. We aim to assess the impact of AI on the creation and study of cultural materials, to question its presuppositions, and to explore how these new paradigms can be best used for the benefit of humanity. The first portion of the course will survey the history of the attempts made over the years to create AI using computational methods and the philosophical critiques of those attempts. We will then turn to how modern connectionist AI systems function, including neural networks, transformers and predictive models, and how they generate their output. In the second half of the course we will review the wide variety of recent developments in Generative AI systems that use large foundation models to generate remarkably human-like output, and we will experiment with and critically evaluate these systems via a series of hands-on exercises. We will consider the benefits and drawbacks of such tools for research in the humanities and discuss their social and cultural impact more generally.
Instructor(s): Jeffrey Tharsen Terms Offered: Spring

Equivalent Course(s): DIGS 30006

DIGS 20007. History and Theory of Computing for the Humanities. 100 Units.
This course surveys (1) the history and theory of digital computing, (2) the ways computers have been used in the humanities, (3) recent theoretical debates surrounding the contested concept of "digital humanities," (4) the philosophical issues raised by digital knowledge representation and artificial intelligence, and (5) the ethical and public policy issues raised by the pervasive use of digital technology in present-day societies.
Instructor(s): David Schloen Terms Offered: Winter
Prerequisite(s): DIGS 20001/30001, “Introduction to Computer Programming with Python” (or an equivalent course in computer programming) and DIGS 20003/30003, “Data Management for the Humanities.” These prerequisites may be waived in some cases with the instructor’s consent.
Equivalent Course(s): DIGS 30007

DIGS 20009. Machine Learning for the Humanities. 100 Units.
Machine learning is an important aspect of artificial intelligence that uses statistical algorithms to detect patterns in digital data and make predictions on the basis of those patterns, improving the predictions iteratively over time. It is the basis of computer vision (image recognition) and machine translation of natural language (both written texts and sound recordings). So-called deep learning using many-layered neural networks is a subset of machine learning and is the basis of generative AI using large language models (e.g., ChatGPT). This course introduces machine learning with a focus on its uses in the study of human languages, culture, and history in the disciplines of the humanities. Prerequisites: DIGS 20001/30001, "Introduction to Computer Programming Using Python" and DIGS 20002/30002, "Introduction to Statistics Using Python," or equivalent courses in computer programming and statistics.
Terms Offered: Autumn
Equivalent Course(s): DIGS 30009

DIGS 20016. Introduction to Digital Humanities at UChicago. 100 Units.
This course is designed to introduce students of Digital Studies to the impactful applications of digital methods in active research at the University of Chicago. The objective is to illustrate the breadth of cultural preservation, new insights and unique forms of data that are archived and explored within the division. We will hear from experts and multiyear, cross-cultural projects across the humanities. This is a required course for first-year MA candidates.
Instructor(s): Helma Dik Terms Offered: Autumn
Prerequisite(s): none
Equivalent Course(s): DIGS 30016

DIGS 20021. Digital Archaeology. 100 Units.
This course introduces students to a variety of computational methods used in archaeology and art history for the digital representation and analysis of cultural sites, buildings, landscapes, and artifacts. Relevant concepts and techniques are taught by means of both explanatory lectures and hands-on exercises. Software tools used in the course include ArcGIS and QGIS for geospatial data and map-creation; Agisoft Metashape for photogrammetry and 3D modeling; OCHRE for integrated multimedia data management; and Python software libraries for image analysis, feature recognition, and statistics. Gamification and the use of augmented reality and virtual reality in archaeology are discussed briefly; these topics are covered in detail in DIGS 20041/30041, "Digital Media I: Game Design with Unity," and DIGS 20042/30042, "Digital Media II: Extended Reality with Unity."
Instructor(s): David Schloen Terms Offered: Spring
Prerequisite(s): DIGS 20001/30001, “Introduction to Computer Programming with Python” (or an equivalent course in computer programming), DIGS 20002/30002, “Data Analysis I: Introduction to Statistics” (or an equivalent course in statistics), and DIGS 20003/30003, “Data Management for the Humanities.” These prerequisites may be waived in some cases with the instructor’s consent.
Equivalent Course(s): DIGS 30021

DIGS 20022. The Programming Humanist: Text Analysis in the Age of AI. 100 Units.
Computational Humanities is transforming the study of literature, history, and culture. This hands-on course introduces the latest computational methods for textual analysis through Python programming, teaching you to analyze text collections-from classic literature to social media archives, historical documents to contemporary websites. You'll learn practical Python techniques-including web scraping to build datasets and data visualization-while diving into cutting-edge AI technologies. These include Natural Language Processing (NLP) and transformer models (the technology behind ChatGPT) for applications like topic modeling, sentiment analysis, and zero-shot classification. No programming experience required. The course provides both the basics of Python programming and the practical tooling to conduct your own digital humanities project. Throughout, you'll learn best practices for using computational and AI tools in research while developing a critical perspective on their limitations and biases. Ideal for students interested in the intersection of computation, AI, and the humanities.
Instructor(s): Gladstone, Clovis Terms Offered: Winter
Prerequisite(s): None
Equivalent Course(s): DIGS 30022

DIGS 20031. Digital Texts I: Corpus Building and Corpus Statistics. 100 Units.
The purpose of this course is to introduce students in the humanities to digital methodologies for the study of texts. 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, and 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 giving students the necessary tools 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): Clovis Gladstone Terms Offered: Winter
Equivalent Course(s): RLLT 34550, RLLT 24550, DIGS 30031

DIGS 20032. Digital Texts II: Natural Language Processing and Deep Learning. 100 Units.
This course is a theoretical and methodological introduction to advanced textual processing, understanding and analysis with a focus on current trends in deep learning and artificial intelligence. We will consider both the practical aspects of building AI models for language and the social, cultural, ethical and philosophical issues related to their development and deployment. In addition to evaluating these new methodologies in the light of traditional approaches, students will gain extensive experience in using Python to create and fine-tune deep learning and AI models, and by the end of the course will have developed their own individual projects, thereby gaining a practical understanding of advanced text analysis workflows along with specific tools and methods for evaluating models, systems and results. Prerequisite: DIGS 20031/30031 "Digital Texts I: Corpus Building and Corpus Statistics" or instructor consent.
Instructor(s): Jeffrey Tharsen Terms Offered: Spring
Prerequisite(s): DIGS 20031/30031, “Digital Texts I: Corpus Building and Corpus Statistics.”
Equivalent Course(s): DIGS 30032

DIGS 20043. Digital Media III: Creating 3D Worlds in Blender. 100 Units.
This course introduces students to digital rendering, modeling, and sculpting using the Blender platform.
Prerequisite: DIGS 20001/30001, "Introduction to Computer Programming Using Python" or an equivalent course in computer programming.
Equivalent Course(s): DIGS 30043, MADD 20043

DIGS 26021. Sense & Sensibility & Science. 100 Units.
In Sense & Sensibility & Science, you will learn how to better incorporate into your thinking and decision making the problem-solving techniques of science at its best. Many insights and conceptual tools from scientific thinking are of great utility for solving problems in your own day-to-day life. Yet, as individuals, as groups, as whole societies we fail to take full advantage of these methods. The focus in this course is on the errors humans tend to make, and the approaches scientific methodology has developed (and continues to develop) to minimize those errors. The course includes a discussion of the nature of science, what makes science such an effective way of knowing, how both non-scientific thinking and scientific thinking can go awry, and how we can reason more clearly and successfully as individuals, as members of groups, and as citizens of a democracy. This undergraduate course is simultaneously taught at UC Berkeley, Harvard and UChicago in spring. UChicago's course, premiered in 2024, built on a decade of experience developing and teaching the popular course at Berkeley and Harvard's adoption of its own version in 2021.
Terms Offered: Spring
Prerequisite(s): PQ: Third or fourth-year standing.
Equivalent Course(s): HIPS 26021, PBPL 26021, BPRO 26021, SCPD 26021, SOSC 26021