Department of English

Spring 2020

Humanities Analytics (HumAn) Minor Courses

*Updated October 25, 2019
Information subject to change.*

FOR MORE INFORMATION, CONTACT:
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Baker Hall 259
https://www.cmu.edu/dietrich/english/undergraduate/minors/humanities-analytics-minor.html

**Required Courses:**

**76-380**  
Methods in Humanities Analytics  
Instructor: Professor David Brown  
Meetings: TR 9:00-10:20 a.m.  
Units: 9

The computer-aided analysis of text has become increasingly important to a variety of fields and the humanities is no exception, whether in the form of corpus linguistics, stylometrics, "distant reading," or the digital humanities. In this course, we will build a methodological toolkit for computer-aided textual analysis. That toolkit will include methods for the collection data, its processing via off-the-shelf software and some simple code, as well as its analysis using a variety of statistical techniques. In doing so, the class offers students in the humanities the opportunity to put their expertise in qualitative analysis into conversation with more quantitative approaches, and those from more technically-oriented fields the opportunity to gain experience with the possibilities and pitfalls of working with language. The first part of the term will be devoted to introducing fundamental concepts and taking a bird's eye view of their potential application in domains like academic writing, technical communication, and social media. From there, students will initiate projects of their own choosing and develop them over the course of the semester. The goal is to acquaint students with the strengths and limitations of computer-aided textual analysis and to provide them with the necessary foundational skills to design projects, to apply appropriate quantitative methods, and to report their results clearly and ethically to a variety of audiences. This class requires neither an advanced knowledge of statistics nor any previous coding experience, just a curiosity about language and the ways in which identifying patterns in language can help us solve problems and understand our world.

**Core Courses:**

**76-361**  
Corpus Rhetorical Analysis  
Instructor: David Kaufer  
Meetings: MW 9:00-10:20 a.m.  
Units: 9

The Digital Humanities is a huge and growing field spanning many disciplines and skill sets. The focus of this course is on tools and methods that allow students to analyze textual corpora as purveyors of stories, information, and arguments that seek to influence cultural thinking, reveal existing cultural mindsets, and often both in tandem, either synchronically or diachronically. This is the point of view often taken by analysts who work for universities, think tanks and intelligence
agencies who seek to understand cultural trends and mindsets from volumes of digital texts. For such analysts, close reading is an indispensable part of their work and computing tools help focus their reading while reading helps refine their understanding of the computer output. The course will give students intensive practice with methods and tools for analyzing corpora of text at the word, phrase, and sentence level, and with working with large scalable dictionaries and multivariate statistics.

76-425  Rhetoric, Science, & the Public Sphere  
Instructor: Professor James Wynn  
Meetings: MW 10:30-11:50 a.m.  
Units: 9  
In the 21st century science and technology are ubiquitous presences in our lives. Sometimes these phenomena spark our imagination and affirm our confidence in a better future. In other instances, they create fear and generate protests over the risks new technologies and scientific ideas pose to prevailing social, cultural, economic, and political orders. In this course we will examine the complex dynamics in the relationships between science, technology, and society. Towards this end we will engage with questions such as: How do we decide who an expert is? To what extent do scientists have an obligation to consider the social and ethical consequences of their work? Is public education about science and technology sufficient for addressing social concerns about risk and controversial scientific ideas? We will grapple with these and other questions by exploring public debates including conflicts over global warming, vaccinations, and the AIDS crisis. With the help of analytical theories from sociology, rhetoric, and public policy, we will develop a framework for thinking about argument and the dynamics of the relationship between science, technology, and the public. We will also look to these fields for tools to assess public debate and to complicate and/or affirm prevailing theories about the relationship between science and society. Please note: Freshmen are prohibited from registering for this course. Sophomores must obtain instructor permission.

76-429  Introduction to Digital Humanities  
Instructor: Professor Scott Weingart  
Meetings: WF 9:00-10:20 a.m.  
Units: 9  
This course introduces students to core methods and readings in Digital Humanities, an emerging field that’s been called “the next big thing” in literary and cultural studies. Students will read influential scholarship by Miriam Posner, Johanna Drucker, Alan Liu, Bethany Nowviskie, Ted Underwood, and Dan Cohen, and explore successful projects like Linked Jazz, Histography, Wearing Gay History, Colored Conventions, Transcribe Bentham, NYPL Building Inspector, and Six Degrees of Francis Bacon. In an effort to facilitate non-traditional collaborations, the course is open to (a.) humanities students curious about computational approaches to humanistic questions and (b.) students with technical, data-driven, or design backgrounds interested in contributing to humanistic knowledge. Please note: Freshmen are prohibited from registering for this course. Sophomores must obtain instructor permission.

88-300  Programming and Data Analysis for Social Scientists  
Instructor: Professor Mark Patterson  
Meetings: MW 3:00-4:20 p.m.  
Units: 9  
This course provides a first introduction to the statistical programming language R, and is designed primarily with social science majors in mind. Students will develop skills in all facets of the data analysis pipeline, from installing and loading packages and reading in files to data cleaning, munging, visualization and modeling. We welcome students who will be coding for the first time!

Elective Courses for Primary Majors in English, History, Modern Languages, Philosophy:  
Possible courses include but are not limited to:
Some experience with programming is a course prerequisite, for example: 15-112, 15-110 or 15-104. Why are things so hard to use these days? Why doesn’t this thing I just bought work? Why is this web site so hard to use? These are frustrations that we have all faced from systems not designed with people in mind. The question this course will focus on is: how can we design human-centered systems that people find useful and usable? This course is an introduction to designing, prototyping, and evaluating user interfaces. If you take only one course in Human-Computer Interaction, this is the course for you. This class is a core course for undergrads in the HCI Minor but open to all undergrads and grad students, with either technical or non-technical backgrounds. We will cover theory as well as practical application of ideas from Human-Computer Interaction. Course work includes lectures, class discussion, homework, class presentations, and group project. Students will need a prerequisite of a fundamental computer programming course.

Machine Learning in Practice

Machine Learning is concerned with computer programs that enable the behavior of a computer to be learned from examples or experience rather than dictated through rules written by hand. It has practical value in many application areas of computer science such as on-line communities and digital libraries. This class is meant to teach the practical side of machine learning for applications, such as mining newsgroup data or building adaptive user interfaces. The emphasis will be on learning the process of applying machine learning effectively to a variety of problems rather than emphasizing an understanding of the theory behind what makes machine learning work. This course does not assume any prior exposure to machine learning theory or practice. In the first 2/3 of the course, we will cover a wide range of learning algorithms that can be applied to a variety of problems. In particular, we will cover topics such as decision trees, rule based classification, support vector machines, Bayesian networks, and clustering. In the final third of the class, we will go into more depth on one application area, namely the application of machine learning to problems involving text processing, such as information retrieval or text categorization. 05-834 is the HCII graduate section. If you are an LTI student, please sign up for the LTI graduate course number (11-663) ONLY to count properly towards your degree requirements. 05-434 is the HCII undergraduate section. If you are an LTI student, please sign up for the LTI undergraduate course number (11-344) ONLY to count properly towards your degree requirements.

Machine Learning for Text Mining

This course provides a comprehensive introduction to the theory and implementation of algorithms for organizing and searching large text collections. The first half of the course studies text search engines for enterprise and Web environments; the open-source Indri search engine is used as a working example. The second half studies text mining techniques such as clustering, categorization, and information extraction. Programming assignments give hands-on experience with document ranking algorithms, categorizing documents into browsing hierarchies, and related topics.

Principles of Computing

This course provides an introduction to the field of computing and its applications. It covers the fundamental concepts of computer science, including algorithm design, data structures, and computer organization. The course also introduces students to programming, with a focus on developing effective problem-solving skills. Students will learn to write clear and efficient code in a modern programming language. The course includes practical exercises and projects to reinforce the theoretical concepts covered in lectures.

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Units: 10
A course in fundamental computing principles for students with minimal or no computing background. Programming constructs: sequencing, selection, iteration, and recursion. Data organization: arrays and lists. Use of abstraction in computing: data representation, computer organization, computer networks, functional decomposition, and application programming interfaces. Use of computational principles in problem-solving: divide and conquer, randomness, and concurrency. Classification of computational problems based on complexity, non-computable functions, and using heuristics to find reasonable solutions to complex problems. Social, ethical and legal issues associated with the development of new computational artifacts will also be discussed.

**36-202 Statistics & Data Science Methods**

**Instructor:** Professors Rebecca Nugent & Gordon Weinberg

**Meetings:** Multiple

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### Units: 9

This course builds on the principles and methods of statistical reasoning developed in 36-200 (or its equivalents). The course covers simple and multiple regression, analysis of variance methods and logistic regression. Other topics may include non-parametric methods and probability models, as time permits. The objectives of this course is to develop the skills of applying the basic principles and methods that underlie statistical practice and empirical research. In addition to three lectures a week, students attend a computer lab once week for "hands-on" practice of the material covered in lecture. Not open to students who have received credit for: 36-208/70-208, 36-309. Students who have completed 36-401 prior to or concurrent with 36-202 will not receive credit for 36-202.

#### 36-315 Statistical Graphics and Visualization

**Instructor:** Professor Matey Neykov  
**Meetings:**  
Section 1 (Lecture): MW 12:30-1:20 p.m.  
Section A (Recitation): F 12:30-1:20 p.m.  
Section B (Recitation): F 12:30-1:20 p.m.  
Section C (Recitation): F 12:30-1:20 p.m.  
**Units:** 9

Graphical displays of quantitative information take on many forms as they help us understand both data and models. This course will serve to introduce the student to the most common forms of graphical displays and their uses and misuses. Students will learn both how to create these displays and how to understand them. As time permits the course will consider some more advanced graphical methods such as computer-generated animations. Each student will be required to engage in a project using graphical methods to understand data collected from a real scientific or engineering experiment. In addition to two weekly lectures there will be lab sessions where the students learn to use software to aid in the production of appropriate graphical displays.

#### 36-350 Statistical Computing

**Instructor:** Peter Freeman  
**Meetings:** TR 12:00-1:20 p.m.  
**Units:** 9

Statistical Computing: An introduction to computing targeted at statistics majors with minimal programming knowledge. The main topics are core ideas of programming (functions, objects, data structures, flow control, input and output, debugging, logical design and abstraction), illustrated through key statistical topics (exploratory data analysis, basic optimization, linear models, graphics, and simulation). The class will be taught in the R language. No previous programming experience required. 36-225 is a pre-req.

#### 60-142 Digital Photography I

**Instructor:** T. Ross Mantle
Meetings: MW 8:30-11:20 a.m.
Units: 10
This course explores digital photography and digital printing methods. By semester’s end students will have knowledge of contemporary trends in photography, construction (and deconstruction) of photographic meaning, aesthetic choices, and the use of color. Students will learn how digital cameras work, proper digital workflow, RAW file handling, color management and Adobe Photoshop. Through the combination of the practical and theoretical, students will better define their individual voices as photographers. No prerequisites.

Elective Courses for Students with Primary Majors in Programs OTHER THAN English, History, Modern Languages, Philosophy:

Possible courses include but are not limited to:

76-373 Argument
Instructor: Professor James Wynn
Meetings: TR 3:00-4:20 p.m.
Units: 9
The purpose of this course is to give you extensive practice in analyzing and producing effective arguments. For us, an "argument" will involve the conveying of a reasoned position on an issue of controversy, and this conveying may take a variety of generic forms (op-ed pieces, political ads, websites, blogs, essays, grant proposals, prose fiction, films, images, and even everyday conversation). The course will introduce you to the fundamentals of argumentation theory and consider a variety of principles that concern the production, analysis and evaluation of verbal (and to a lesser extent, visual) arguments. You will apply the principles through discussion in class to various cases, through a series of written responses to readings, and by producing several written arguments.

76-389 Rhetorical Grammar
Instructor: Hannah Ringler
Meetings: MW 9:00-10:20 a.m.
Units: 9
This course covers the anatomy of the single and multi-clause English written sentence and is useful for English majors and Master’s students of professional writing (MAPWs) who wish to write with greater awareness and control of the English sentences they write and the awesome variety of sentences available to write. The course overviews the major grammatical forms and functions of the written English sentence. Students will learn to identify the major grammatical forms (Noun, Verb, Adjective), how these forms map on to grammatical functions (subject, verb, and direct object) and how forms and functions combine to create major constituents of the English sentence. Home-grown software, DiaGrammar, will allow students to diagram all the sentence varieties covered in the course. Students will leave this course with a systematic understanding of English sentence grammar as a resource for their continuing development as writers.

76-472 Topics in Journalism: Storytelling in a Digital Age
Instructor: Steve Twedt
Meetings: R 6:30-9:20 p.m.
Units: 9
Advanced Journalism students will learn how to plan and execute long-form news feature stories from the ground up, starting with recognizing a promising idea, organizing a solid proposal then ultimately producing a publication-ready report that is both accurate and compelling.

We will focus on four types of feature stories over the course of the semester: a trend story, a profile, an explanatory report and a data-driven investigative story.
Each will require strong news judgment and solid writing skills, plus the ability to adapt as some story leads unexpectedly come to a dead end while promising other angles rise to the surface. Don’t be surprised if the final product is notably different than the original idea; that’s often the path of the most successful reports.

While each student is responsible for his or her work, class sessions will be highly collaborative as ideas and strategies are critiqued with an eye toward helping all students achieve their best work. Please note: Freshmen are prohibited from registering for this course. Sophomores must obtain instructor permission.

**79-200 Introduction to Historical Research and Writing**

**Instructors:** Professors Laurie Eisenberg & Steven Schlossman

**Meetings:** MW 12:00-1:20 p.m.

**Units:** 9

Introduction to Historical Research acquaints students with how historians practice their craft in interpreting events from the past. As a class, we will work together through a variety of tools in the historian’s toolbox, using episodes from American history as case studies. By the second half of the semester, students will have identified their own topics, in any time period or field of history, and will write research papers incorporating the analytical techniques covered earlier. The goal is for students to learn the skills required to identify a research topic, find and work with many kinds of sources, create a strong thesis statement, design a persuasive paper, and produce a properly formatted and well written research paper. Students who have taken the 79-209 mini, The Art of Historical Detection with Prof. Eisenberg previously, are not eligible to enroll in this course.

**80-180 Nature of Language**

**Instructors:** Professors Mandy Simons & Andrew Yankes

**Meetings:**

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**Units:** 9

Language is used to talk about the world or to describe it, but how do we go about describing language itself? Linguistics is the name given to the science of language, whose task it is to give such a description. The discipline of linguistics has developed novel tools for describing and analyzing language over the last two hundred years and in this course we learn what these tools are and practice applying them. Sub-areas of linguistics which we study include phonetics (the study of speech sounds), phonology (the study of sound systems), morphology (the study of parts of
words), and syntax (the study of combinations of words). Beyond this, we look at changes in language over time, and we consider the puzzle of linguistic meaning. The methods of linguistics are useful in the study of particular languages and in the study of language generally, so this course is useful for students of foreign languages as well as those interested in going on to study language acquisition, psycholinguistics, sociolinguistics, philosophy of language, and computer modeling of language.

82-280 Linguistic Analysis
Instructor: Professor Thomas Werner
Meetings: TR 12:00-1:20 p.m.
Units: 9

At one level, language is constituted by nothing but sounds, or marks on paper. How can such physical objects be used to create or transmit meaning? The answer assumed in this course is that objects with specific physical features are assigned symbolic or linguistic values on the basis of those features. By the juxtaposition of such objects (phonemes or graphemes), larger symbolic objects are created (morphemes). Morphemes have the special property that they can be associated in a consistent way with meanings. In a progressive fashion, words are built from morphemes, phrases from words, and sentences from phrases. Sentences have different moods, and these moods correspond to their function with respect to the encoding and transmission of information. Indicative sentences carry information, interrogative sentences request information, imperative sentences demand action, conditional and modal sentences present alternative possibilities, and so on. The goal of this course is to investigate the structure of the linguistic entities by which these communicative functions are realized. Building on material taught in Nature of Language, we look in detail at the morphology and syntax of human languages, paying special attention to cross-linguistic variety.