



The University of Western Ontario
HISTORY 4816A / 9877A
Digital Research Methods
Fall/Winter 2022-23
Asynchronous online course

Instructor: Professor William J. Turkel

Office Hours: Online by appointment
Department of History, Office: Lawson Hall 2267
Email: wturkel@uwo.ca

Course Description:

In this course students will learn how historical content is produced, presented, and published online; how to find and evaluate digital primary and secondary sources; and how to use computational techniques to work with digital resources. No previous background in the subject area is required.

Prerequisite(s):

Registration in any academic program at the second-year level or above.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. The decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Antirequisite(s):

Digital Humanities 2130A/B, Digital Humanities 3902F/G, the former History 2816F/G.

Course Syllabus:

Research of all kinds now crucially involves the acquisition and use of digital sources, both primary and secondary. In this course, you will learn to find, harvest, manage, excerpt, cluster and analyze digital materials throughout the research process, from initial exploratory forays through the production of an electronic article or monograph which is ready to submit for publication. The digital sources that we work with include texts, images, maps, code, social media, spreadsheets, databases and linked open data. The techniques that we will employ are currently used by relatively few humanists and social scientists—although they have become much more crucial in an age of pandemic lockdowns. Computation won't magically do your research for you, but it will make you much more efficient. You

can focus on close reading, interpretation, and writing, and use machines to help you find, summarize, organize and visualize sources.

Prior Experience

The only thing that you need to do well in this course is a willingness to learn new things and the perseverance to keep working when you're confused or when you realize that you could spend a lifetime learning about the topics and technologies that we will cover in class, and still not master them all. Students will come into the course with very different levels of experience and expertise. Some, probably most, will be familiar only with the rudiments of computer and internet use. A few may already be skilled programmers.

Workload

This course requires that you spend at least a bit of time each day (say 20-30 minutes) practicing your new skills. It's a lot like learning a new language, learning to play a musical instrument, or going to the gym. At first it is going to be hard but be patient with yourself and ask a lot of questions. With daily practice, you will soon find ways to do your research and coursework faster and more efficiently. If you can't commit to regular practice, however, you should probably not take this course. The techniques that you learn in this class build cumulatively week-by-week, and there are several evenly spaced assignments of equal value.

Learning Outcomes

At the conclusion of this course, you will

- Be aware of a wide variety of different kinds of digital sources and strategies for making use of them computationally
- Be familiar with a range of research approaches in digital humanities, computational social science, and related disciplines
- Be acquainted with methodological applications of artificial intelligence
- Be more familiar with using computer code as a medium of expression

Course Materials:

You will need a Windows, Mac or Linux laptop or desktop. A tablet or netbook will probably not be sufficient. If you have any concerns, email me.

You will need to purchase a **student desktop license** for Wolfram Research's *Mathematica* software. (Don't let the name scare you, you won't need any particular training in mathematics to do well in the class). A one semester license is \$56 CAD. If you think you might want to use Mathematica for some of your other courses or in the summer, a one-year license is \$88 CAD. You can purchase the software here

<https://www.wolfram.com/mathematica/pricing/students/>

If you are unable or unwilling to purchase the software, please do not take the course.

The required text for the course is freely available online, along with more than 100 screencasts:

William J. Turkel. *Digital Research Methods with Mathematica*, 2nd rev ed. (2020).

<https://williamjturkel.net/digital-research-methods-with-mathematica/>

Methods of Evaluation:

There are five assignments, worth 20% each, evenly spread throughout the term. Each assignment has a suggested due date and, a week later, a zero date. If you hand in your assignment before the zero date, you will receive full credit for your work. After the zero date, it will be worth nothing.

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to Academic Counseling as soon as possible.

Course Schedule and Readings:

Week 01. Introduction to Mathematica. Interacting with notebooks.

Week 02. Reading Code. Word frequency, word clouds and stopwords. Computable Knowledge. Entities, tables, timelines, and maps.

Week 03. Text Content. Mathematica notebooks and expressions, strings, and natural language processing. Data Structures. Lists, associations, and datasets.

Week 04. Reusing Code. Defining and developing functions, keyword in context (KWIC). Networks. Metadata, matrices, and social network analysis.

Week 05. Indexing and Searching. Pattern matching, topic classification and term distribution. Geospatial Analysis. Geographic information: raster, vector, and attribute data.

Week 06. Images. Computer vision, face detection, feature extraction and image mining. Page Images. Optical character recognition (OCR), figure extraction and classification.

Week 07. Crawling. Browser automation, batch downloading, web archives and WARC files. Linked Open Data. Resource description framework (RDF), SPARQL queries and endpoints, JSON-LD.

Week 08. Markup Languages. Scraping and parsing, XML, really simple syndication (RSS) and text encoding initiative (TEI). Studying Societies. Computational social science, search data, social media, and social networks.

Week 09. Extracting Keywords. Information retrieval, term frequency-inverse document frequency (TF-IDF) and rapid automatic keyword extraction (RAKE). Word and Document Vectors. Feature extraction, dimension reduction, word embeddings and global vectors.

Week 10. Citations. References, web services, bibliographic linked open data, and citation networks. Natural Language. Multilingual analysis, computational linguistics, and sentiment analysis.

Week 11. Web Services. Entity networks, publication search, dashboards, manipulating JSON. Databases. Parts, selections and transformations, computations and querying, relations.

Week 12. Measuring Images. Photogrammetry, georectification, handwriting and facial 3D reconstruction. Machine Learning. Unsupervised clustering, classify, predict, and transfer learning.

Additional Statements

Accessibility Options:

You may also wish to contact Accessible Education (formerly known as Services for Students with Disabilities (SSD)) at 661-2111 x 82147 for any specific question regarding an accommodation. See: [Accessible Education - Academic Support & Engagement - Western University \(uwo.ca\)](http://www.uwo.ca/accessible-education)

Request for Accommodations/Medical Issues

Students are entitled to their privacy and consequently they do not need to disclose personal information to their course professors. In the event that students feel the need to discuss personal information, they should see the graduate chair. Unlike undergraduate students, graduate students cannot be referred to Social Science Academic Counselling to have their medical or non-medical circumstances evaluated and to receive a recommendation for accommodation. Those facilities are for undergraduates only, and there is no process beyond the department to secure recommendations for accommodation. Our process is that faculty should deal with routine requests for extensions. However, a student's request for accommodation (on medical, non-medical, compassionate grounds) should go to the graduate chair, Prof. Eli Nathans (enathans@uwo.ca) who will consult and communicate with faculty. Additionally, faculty and students should communicate with the grad chair about any case in which work is not submitted before grades are due. In the event that the graduate chair is also the course professor, then a request for accommodation can be taken to the department chair.

Copyright

Lectures and course materials, including power point presentations, outlines, and similar materials, are protected by copyright. You may take notes and make copies of course materials for your own educational use. You may not record lectures, reproduce (or allow others to reproduce), post or distribute lecture notes, wiki material, and other course materials publicly and/or for commercial purposes without my written consent.

Plagiarism:

Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offense.

For more information on plagiarism and other scholastic offenses at the graduate level see: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

The following rules pertain to the acknowledgements necessary in academic papers.

A. In using another writer's words, you must both place the words in quotation marks and acknowledge that the words are those of another writer.

You are plagiarizing if you use a sequence of words, a sentence or a paragraph taken from other writers without acknowledging them to be theirs. Acknowledgement is indicated either by (1) mentioning the author and work from which the words are borrowed in the text of your paper; or by (2) placing a footnote number at the end of the quotation in your text, and including a correspondingly numbered footnote at the bottom of the page (or in a separate reference section at the end of your essay). This footnote should indicate author, title of the work, place and date of Publication and page number. Method (2) given above is usually preferable for academic essays because it provides the reader with more information about your sources and leaves your text uncluttered with parenthetical and tangential references. In either case words taken from another author must be enclosed in quotation marks or set off from your text by single spacing and indentation in such a way that they cannot be mistaken for your own words. Note that you cannot avoid indicating quotation simply by changing a word or phrase in a sentence or paragraph which is not your own.

B. In adopting other writer's ideas, you must acknowledge that they are theirs.

You are plagiarizing if you adopt, summarize, or paraphrase other writers' trains of argument, ideas or sequences of ideas without acknowledging their authorship according to the method of acknowledgement given in 'A' above. Since the words are your own, they need not be enclosed in quotation marks. Be certain, however, that the words you use are entirely your own; where you must use words or phrases from your source; these should be enclosed in quotation marks, as in 'A' above.

Clearly, it is possible for you to formulate arguments or ideas independently of another writer who has expounded the same ideas, and whom you have not read. Where you got your ideas is the important consideration here. Do not be afraid to present an argument or idea without acknowledgement to another writer, if you have arrived at it entirely independently. Acknowledge it if you have derived it from a source outside your own thinking on the subject.

In short, use of acknowledgements and, when necessary, quotation marks are necessary to distinguish clearly between what is yours and what is not. Since the rules have been explained to you, if you fail to make this distinction, your instructor very likely will be forced to regard your omission as intentional literary theft. Plagiarism is a serious offence which may result in a student's receiving an 'F' in a course or, in extreme cases, in their suspension from the University.

If a History graduate course professor suspects course work of possible plagiarism, or if a graduate supervisor suspects a cognate or thesis of possible plagiarism, the faculty member will meet with the student. If the issue is not resolved, the student then meets with the graduate chair to discuss this situation, and so that the student can present or respond to evidence. Afterwards the graduate chair will make a decision about whether misconduct has occurred and any penalties; this will be communicated in writing to the student within 3 weeks. The student may appeal this decision to the Vice-Provost (Graduate) within 3 weeks of the issuance of the chair's decision. If the student does not

appeal, the Vice-Provost will review the case. The Vice-Provost may confirm, affirm, vary, or overturn the graduate chair's decision or penalty.

Information on the appeals procedures for graduate students can be found here:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/appealsgrad.pdf

Support Services

Students who are in emotional/mental distress should refer to Mental Health@Western, http://uwo.ca/health/mental_wellbeing/ for a complete list of options about how to obtain help.

As part of a successful graduate student experience at Western, we encourage students to make their **health and wellness** a priority.

- Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page <http://www.music.uwo.ca/> and our own McIntosh Gallery <http://www.mcintoshgallery.ca/>
- Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>
- Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html

UWO has many services and programs that support the personal, physical, social, and academic needs of students, in a confidential environment. The Student Development Centre (SDC) has trained staff and an array of services to help students achieve their personal, academic and professional goals. See: [Academic Support & Engagement - Western University \(uwo.ca\)](http://www.uwo.ca/academic_support_engagement/)

If you have any further questions or concerns, please contact, Heidi Van Galen, Department Manager, Department of History, 519-661-2111 x84963 or e-mail vangalen@uwo.ca.