



The University of Western Ontario

HISTORY 4816A / 9877A

Digital Research Methods

Fall/Winter 2020-21

4 hours per week, no fixed times scheduled, offered online only

Instructor: Professor William J. Turkel

Office Hours: Mondays through Thursdays, 5-5:45pm or by appointment, meeting online only

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In this course students will learn how historical content is produced, presented and published online; how to find and evaluate digital primary and secondary sources; and how to use computational techniques to work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.

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 a number of 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:

To get the most out of this class, 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 should 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).

<http://www.wolfram.com/mathematica/pricing/students-individuals.php>

You can purchase the license for the semester, for the year or permanently. If you are unwilling or unable to purchase the software, please do not take this course.

The required text for the course is freely available online:

William J. Turkel. *Digital Research Methods with Mathematica*, 2nd ed. (2019).

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

Methods of Evaluation:

<i>Assignment</i>	<i>Worth</i>	<i>Handed Out</i>	<i>Due Date</i>	<i>Zero Date</i>
01	20%	Sep 17	Sep 24	Oct 01
02	20%	Oct 01	Oct 08	Oct 15
03	20%	Oct 15	Oct 22	Oct 29
04	20%	Oct 29	Nov 12	Nov 19
05	20%	Nov 19	Nov 26	Dec 03

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.

Course Schedule and Readings:

- Sep 10. **Reading Code.** Word frequency, word clouds and stopwords.
- Sep 15. **Computable Knowledge.** Entities, tables, timelines and maps.
- Sep 17. **Text Content.** Mathematica notebooks and expressions, strings and natural language processing.
- Sep 22. **Data Structures.** Lists, associations and datasets.
- Sep 24. **Reusing Code.** Defining and developing functions, keyword in context (KWIC).
- Sep 29. **Networks.** Metadata, matrices and social network analysis.
- Oct 01. **Indexing and Searching.** Pattern matching, topic classification and term distribution.
- Oct 06. **Geospatial Analysis.** Geographic information: raster, vector and attribute data.
- Oct 08. **Images.** Computer vision, face detection, feature extraction and image mining.
- Oct 13. **Page Images.** Optical character recognition (OCR), figure extraction and classification.
- Oct 15. **Crawling.** Browser automation, batch downloading, web archives and WARC files.
- Oct 20. **Linked Open Data.** Resource description framework (RDF), SPARQL queries and endpoints, JSON-LD.
- Oct 22. **Markup Languages.** Scraping and parsing, XML, really simple syndication (RSS) and text encoding initiative (TEI).
- Oct 27. **Studying Societies.** Computational social science, search data, social media and social networks.
- Oct 29. **Extracting Keywords.** Information retrieval, term frequency-inverse document frequency (TF-IDF) and rapid automatic keyword extraction (RAKE).
- Nov 02-08. FALL STUDY BREAK
- Nov 10. **Word and Document Vectors.** Feature extraction, dimension reduction, word embeddings and global vectors.
- Nov 12. **Citations.** References, web services, bibliographic linked open data and citation networks.
- Nov 17. **Natural Language.** Multilingual analysis, computational linguistics and sentiment analysis.
- Nov 19. **Web Services.** Entity networks, publication search, dashboards, manipulating JSON.
- Nov 24. **Databases.** Parts, selections and transformations, computations and querying, relations.

- Nov 26. **Measuring Images.** Photogrammetry, georectification, handwriting and facial 3D reconstruction.
- Dec 01. **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: <http://success.uwo.ca/academics/sas/index.html>

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. Nancy Rhoden (nrhoden@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

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: <http://www.sdc.uwo.ca>.

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