
Term Information

Effective Term Spring 2025

General Information

Course Bulletin Listing/Subject Area Near Eastn Lang and Cultures
Fiscal Unit/Academic Org Near East S Asian Lang/Culture - D0554
College/Academic Group Arts and Sciences
Level/Career Graduate, Undergraduate
Course Number/Catalog 5145
Course Title Digital Editions of Ancient Texts and Artifacts
Transcript Abbreviation DigitalAncientTxts
Course Description This training course is designed to introduce students to the purpose, philosophy, use, and construction of digital editions of ancient sources or artifactual databases. Students will be taught how to construct a basic PostgreSQL database using both command line input (cli) and administrative graphic user interfaces (GUIs).
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Lecture, Workshop
Grade Roster Component Lecture
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites
Exclusions
Electronically Enforced No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 16.1199
Subsidy Level Doctoral Course
Intended Rank Junior, Senior, Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Learn a brief history of modern editions of ancient manuscripts
- Learn how to create a database for studying ancient sources
- Learn how to digitally preserve ancient sources

Content Topic List

- Structure of research data
- OSU DLATO project
- Political, economic, and social conversation about issues regarding the ethics and sustainability of digital editions

Sought Concurrence

No

Attachments

- Moore - 2021 - Teaching Digital Editions of the Bible and Ancient.pdf: Article on this type of course written by the prof

(Other Supporting Documentation. Owner: Carmichael, Phoebe Cullen)

- Heb Curric Map 2024.pdf: Curriculum Map

(Other Supporting Documentation. Owner: Carmichael, Phoebe Cullen)

- NELC_5145_syllabus_Spr25.pdf: Syllabus

(Syllabus. Owner: Carmichael, Phoebe Cullen)

Comments

- Resubmitting as in-person with curric map *(by Carmichael, Phoebe Cullen on 04/10/2024 02:59 PM)*

- - If this is an online course, please follow instructions for DL

<https://asccas.osu.edu/submission/development/submission-materials/distance-courses>

- Please remember that for all new courses, if a course can count in one of your majors (even as an elective), an updated curriculum map should be uploaded. *(by Vankeerbergen, Bernadette Chantal on 04/10/2024 01:07 PM)*

COURSE REQUEST
5145 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette
Chantal
04/11/2024

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Carmichael, Phoebe Cullen	04/10/2024 12:41 PM	Submitted for Approval
Approved	Liu, Morgan Yih-Yang	04/10/2024 12:59 PM	Unit Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	04/10/2024 01:07 PM	College Approval
Submitted	Carmichael, Phoebe Cullen	04/10/2024 03:00 PM	Submitted for Approval
Approved	Liu, Morgan Yih-Yang	04/10/2024 03:08 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	04/11/2024 07:35 AM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Neff, Jennifer Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	04/11/2024 07:35 AM	ASCCAO Approval

Digital Editions of Ancient Texts and Artifacts

Class Number NELC 5145

Meeting: TBA (once a week 2hr45min) | Lecture/Workshop | 3 units | Graded A-E | In-Person

Various NESA majors and minors.

All NESA ancient studies graduate students.

Graduate students or upper division undergraduates in an ancient history adjacent department.

James D. Moore | moore.5089@osu.edu | Hagerty Hall 319

Office hours. TBA.

Course Description

This training course is designed to introduce students to the purpose, philosophy, use, and construction of digital editions of ancient sources or artifactual databases. Students will be taught how to construct a basic PostgreSQL database using both command line input (cli) and administrative graphic user interfaces (GUIs). Weekly, discussion topics relevant to the construction of backend, frontend, and data structuring will be complimented by a training session in which students build their locally hosted database. Data structuring topics include but are not limited to data (social) networking, geolocation, textual grammatical analyses, lexicography, 3D or multispectral imagining, and advanced querying. The course requires weekly preparation and in-class work. This course is essential for students who plan a career in the academic study of ancient texts or artifacts, in which a growing number of job opportunities are related to digital editions or database use. Additionally, the basic computing skills as well as the ability to define, structure, analyze, and query data translate to professions beyond the fields of the humanities. Student databases will be built to resemble the basic structure of the various projects associated with the OSU Digital Laboratory for Ancient Textual Objects, but students will tailor their own databases to their own final projects, theses, or research agenda.

Knowledge of at least one ancient language from the ancient world is required, but may be waved by the instructor for students working on archaeological, artifactual, art historical, or related studies.

Objectives and Outcomes

Successful students will be able to explain and demonstrate answers to the following questions.

1. What is a digital edition?

Summary: We will learn a brief history of modern editions of ancient manuscripts. The types of editions and their functions. We will enter into political, economic, and social conversation about issues regarding the ethics and sustainability of digital editions.

2. How do I create my own database for studying ancient sources?

Summary: This will be the most valuable part of the course! Students will be guided through setting up a simple database modeled on the [OSU DLATO project](#).

Challenges: There may be a sharp learning curve for those who have no experience with cli, but easy to follow instructions will help you along the way. Again, your knowledge of an ancient language will be practiced and your ability to present your results to a group.

3. How do I structure research data?

Summary: Second to the observable product (a operational database), the student will learn methods and approaches in data structuring, which will translate beyond its computation value and better prepare the student's research abilities.

4. How does one digitally preserve ancient sources?



Summary: The course will also address various types of digital photographic techniques and the ethics behind these techniques.

How to Succeed in this Class

- Attend and follow the in-class training.
- Work on your database throughout the week and come to class prepared.
- Memorize SQL codes and commands.
- Complete the assignments (midterm, presentation, and final project).

Teaching Philosophy

Please read my statement on teaching philosophy found on Carmen.

Class Schedule

I reserve the right to alter the schedule as the needs of the class change.

All class lessons will be recorded and posted on Carmen for student review. No recording will be downloadable, and each recording will be removed after approximately 3 weeks. All recordings will be removed at the semester's end. Students should be taking notes for their future work.

This course is conducted as an intensive computing workshop. Students will be led through detailed instructions in each lesson using the class-dataset, a selection of assigned texts that are available on Carmen and that the students will input and analyze in their databases during the lesson. **After each class lesson, the student is required to perform the same, input, functions, operations, and procedures on their own dataset** (student-dataset 1, see below). For this reason, no column of "assignments" is expected in the chart below. Each topic on the schedule will be led in-class, and the student will be required to then **DUPLICATE** that process on student-dataset 1 **as** their **homework** before the next class meeting. Students are required to take advantage of office hours and consult fellow classmates, so to not fall behind during difficult weeks.

W	Date	Topic
1		Introduction. Structuring and Using a Database.
2		Introduction to Schemas and Tables
3		Creating Relationships between Tables and Metadata Basics
4		Metadata Customizations
5		Lexicon Schema and Tables
6		Lexicon Schema and Tables cont'd.
7		Basic Front End (HTML) and App Dev (Libre Office Base)
8		Data Input Strategies
9		Advanced Querying of the Data
10		Visualizing the Data (Orange and Gephi)
11		Digital Photography and (3D) Scanning
12		Presentations
13		Course Summary, Final Matters, Project Preparation

– If our schedule is fortunate enough to include a 14th meeting session, we will include bibliographic integration exercises (Zotero).

– For content and specific training preparation requirements (i.e., "homework") for each week see Carmen.

Course Materials

This course will require students to have their own personal computer—not a tablet!—that runs a desktop operating system: preferably Mac OSX or alternatively Linux or Windows with a Linux subsystem.

WARNING: The student will be asked to download, open accounts, and use software throughout the course on their own machine. This comes at the student's own costs (for paid recommendations) and the student's own risk, regarding (cyber) security.

Readings

Basic readings to orient the student to databases, digital humanities, and data structuring/organization will be available on Carmen and assigned the first week of the course. In many cases, students will be assigned (free) online tutorial videos to supplement or prepare for class trainings.

The student must consult the class's Zotero. For the link see Carmen.

Device/Software

- Machine running Mac OSX or alternatively Linux or Windows (with Linux sub-system).
- Students will use PostgreSQL, Orange Data Mining, Gephi, Libre Office Base, Zotero, Gimp, VS Code, DigitalEpigraphy.org, and iTerm throughout the semester. Specific downloading instructions will be found in class lessons and on Carmen.
- Additional web-based applications will be assigned as needed.

Grading

What You Can Expect

Throughout the course, students will build and adapt their databases using both sample data (the **class-dataset**), which is structured during the class lessons and two datasets relevant to their own work (see below). One **student-dataset (1)** will be used for homework assignments, which will culminate in a graded short class presentation of this dataset during the semester. The second **student-dataset (2)** will serve as the basis of their final course project. A midterm quiz will be included to ensure that students are committing the basic SQL coding and ideas to memory.

Assignment Weight (Percentage of Overall Grade [100%])

Weekly Meetings: work on database structuring and student-dataset 1: 55%

Presentation of student-dataset 1: 10%

Midterm 10% (must receive a passing grade to pass the course)

Final project: 25%

Grading Scale

- 93-100: A
- 90-92: A -
- 87-89: B+
- 83-86: B
- 80-82: B -
- 77-79: C+
- 73-76: C
- 70-72: C -
- 67-69: D+
- 60-66: D
- Under 60: E

Weekly Meetings Database Structuring and Student-Dataset (55%)

Students will be assigned a 5% weekly grade for each day's class session for weeks 2–12, except for the day on which they make their class presentation on student-dataset 1. This 5% weekly grade is based on (1) how prepared the student came to the lesson having prepared their own dataset and (2) how responsive they are in the discussion and training sessions. For instance, when database customizations were assigned, does the student create and describe to the class the customization when asked, or is the student actively participating in discussions on data structuring? **Students should expect to work a minimum of three hours per week outside of class.**

Student-datasets

The class will model database construction with a documentary textual artifactual dataset (**class-dataset**).

Students must select and *have approved* by me their first dataset (**student-dataset 1**) *before the beginning of class on week 2* (see Carmen). Students of ancient languages are encouraged to choose a literary or religious text for their first dataset and documentary sources for **student-dataset 2**, which *must be approved* by me *before the 9th week of class*. The datasets may be in multiple ancient languages, but the student must have demonstrated competence in all languages.

Note, I am not an expert on all ancient languages. I will help guide you in choosing your datasets. It is highly encouraged that you choose data based on the subject matter of your student projects, theses, or research agendas. The literary/religious sources should be approximately 40–100 lines of data and the documentary sources should be approximately 5–20 independent textual artifacts, of approximately 1–10 lines each.

Students working on non-textual artifacts should be in immediate dialog with me about delimiting their datasets.

Midterm 10%

There will be a take home midterm on Carmen to be completed OUTSIDE of class. Scheduling and content, TBA, but the student can expect to take the midterm between weeks 5–8, depending on the semester's needs/developments. **Students must pass the midterm to pass the course.**

Final project: 20%

The final project will require you to fully input student-dataset 2 into your database. You will create research queries for your data, with theses and objects. You will be expected to describe (with SQL code and discussion) what customizations you made to your database to better curate your dataset, why these were necessary, and what they achieved. You will practice data visualization and describe its value for your dataset. All results will be submitted as a clearly written paper with necessary graphics, tables, screenshots, etc. The final project is due the last day of finals week or earlier (TBD) for graduating students. More instructions can be found on Carmen.

Late Policy and Attendance

Database construction, and therefore this course's workload, is cumulative. Students who fall behind may watch the posted class recordings and catch up, but without demonstrating their progress in an office hour's meeting, the student will not receive the 5% credit for that week. Attendance is intrinsically tied to the grade, but **Students who stay constantly behind or fall behind by 3 weeks at any point during the semester may be asked to leave the course and receive an E or W grade.**

Academic Policies

Academic Integrity Policy

See “Course Materials | Device”, “Grading”, and “Assignments” in this syllabus for specific statements about academic academic integrity to which each student is obliged.

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct web page (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Please, know that I, as an employee at OSU, am legally responsible for reporting (sexual) assault if a student reports to me.

Commitment to a Diverse and Inclusive Learning Environment

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Land Acknowledgement

We would like to acknowledge the land that The Ohio State University occupies is the ancestral and contemporary territory of the Shawnee, Potawatomi, Delaware, Miami, Peoria, Seneca,

Wyandotte, Ojibwe and Cherokee peoples. Specifically, the university resides on land ceded in the 1795 Treaty of Greenville and the forced removal of tribes through the Indian Removal Act of 1830. I/We want to honor the resiliency of these tribal nations and recognize the historical contexts that has and continues to affect the Indigenous peoples of this land.

More information on OSU's land acknowledgement can be found here: <https://mcc.osu.edu/about-us/land-acknowledgement>

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Disability Services and Requesting Accommodations

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the Safe and Healthy Buckeyes site for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

Religious Accommodations

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.



With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement and the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy. If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the Office of Institutional Equity.

Teaching Digital Editions of the Bible and Ancient Sources. A Reflection

Ensino de Edição Digital da Bíblia e Fontes Antigas. Uma Reflexão

James Moore, Humboldt Universität zu Berlin, Germany

Abstract

This pedagogical article presents an example of how one can teach novice students to build and to work with their own digital editions of ancient sources. It discusses modern approaches to digital editions and promotes teaching SQL databases in ancient studies programs. It provides a detailed guide on how one can structure a student database that will be beneficial to students of all levels and disciplines.

Keywords: SQL Database, PostgreSQL, Bible, Ancient Studies, Digital Editions.

Resumo

Este artigo pedagógico apresenta um exemplo de como os alunos podem aprender a construir e a trabalhar com as suas próprias edições digitais de fontes antigas. O artigo explora abordagens modernas às edições digitais e promove o ensino de bases de dados SQL em cursos de estudos antigos. Fornece, ainda, um guião detalhado para auxiliar os alunos a estruturar uma base de dados, que será vantajosa para todos os níveis de ensino e áreas disciplinares.

Palavras-chave: Base de dados SQL, PostgreSQL, Bíblia, Estudos Antigos, Edições Digitais.

1. Introduction

In the second semester of 2020/1 at the Humboldt University in Berlin, Germany I taught a course titled Introduction to Digital Editions of the Bible and Texts from the Ancient World. The two primary objectives of the course were (1) to introduce students to relational databases, their construction, and their use in personal small group research in the fields of Bible and ancient studies and (2) to survey for the students additional digital tools and resources used in the development and publication of web-based digital editions. The primary learning outcome was the development of a working multilingual Bible manuscript database for each student's future research. Each database included a workspace in

which the student may further develop multilingual/multi-manuscript comparisons, concordances, a multilingual lexicon, complete multilingual word-by-word grammatical analyses, and a biblical commentary. Secondary learning outcomes included the knowledge to expand the student's database into projects on prosopography, social network analysis, paleography, and bibliographic research. Additionally, the students were made aware of digital tools necessary for the modern study of biblical and ancient manuscripts, including types of digital photography, basic techniques for editing photographs (e.g. in Photoshop and Gimp), data storage and access, and indexing vs. storing photographs in their databases. The students were also made aware of full stack development, the API (Application Programming Interface) and UI (User Interface) necessary for a "live" digital edition website.

Central to my teaching philosophy is, and always has been, that every course, no matter how philosophical or abstract, must make clear the pragmatic job skills it teaches students. This course prepares students for cutting-edge research in the fields of Bible and ancient studies by providing technical skills necessary for post-graduate employment.

I do not have a degree in computer science. I am, however, one from the generation that straddled the cultural turn to the digital world, and my interests in computing led me to acquire self-taught knowledge of computing languages. Life choices led me to pursue Ancient Near Eastern Studies. Throughout my career as an undergraduate and graduate student I can recall many failed attempts of finding my own digital workflow. It was often more time-consuming to do work digitally rather than with pen and paper, especially working in right-to-left (rtl) languages. But times have changed, and today, working in databases is extremely time-efficient. I now cannot see a single disadvantage of doing most of my professional work in a database environment.

A very popular approach to digital editions in ancient studies is to prepare a Database alongside XML files. A common approach is to organize the ancient sources' metadata (information about the source) in a database along with paths to external files which hold the sources' textual information. It is popular to store digitized texts in an XML (Extensible Markup Language) file. XML format has been well received in ancient (and cultural) studies because it offers many advantages. One can "markup" (or sometimes called "tag") any part of a text with any type of information (e.g. cultural, grammatical, commentative), and a digital community known as TEI (Text Encoding Initiative; <https://tei-c.org/>) has spent decades adopting and adapting guidelines for how to "markup" languages, both ancient and modern. While XML files marked up with TEI guidelines may be used to present an aesthetically pleasing digital publication, I have found two great disadvantages to using XML in personal or small group research. First, every structural item needs to be defined in an XML file. This means that every paragraph, line, type-face alteration, etc. must be written in code. This is an extremely lengthy process, and while it may be aided by using an editor application combined with a custom written CSS (Cascading Style Sheets) file, these are time-consuming and require technical skills to write. They also may need to change as research develops. Second, it is virtually impossible to extensively markup rtl languages, such as Hebrew or Aramaic, without a customized CSS file, and even then, difficulties abound. In short, XML is

good when a project has a specific and well-defined goal or presentation in mind, but I personally find it more trouble than it is worth for multilingual and advanced research that is ever evolving.

While I informed students in my course of XML and about marking up files, I opted to teach students how to perform most necessary procedures for student (and early career) success within a single SQL relational database. On this point, I will begin to describe the course.

2. The Philosophical Foundation

I began the course by posing the questions: who pays for the internet? What should be free and to whom? This helped us to intellectually orient the course, not only within our context of a public university, but also as researchers who may find themselves on digitalization projects negotiating budgets. These questions allowed us to discuss throughout the course pragmatic issues regarding network access, the limits of open-source software, problems with platform compatibility, the source of digital labor, and other relevant conundrums.

I also asked students to reflect throughout the course on their own methodology, workflows, and processes by which they formulate research questions and complete projects as well as to reflect on their limits on time, labor, and capabilities. By the end of the course it was clear that simply thinking about research problems from the perspective of relational databases is a productive exercise for fine-tuning methodologies and objectives on any research project.

3. The Structure of the Course

My objective was to offer a course that did not require the students to pay for software, but designing such a course came with many challenges. I spent months (1) deciding whether to introduce the students to all the open-source relational database software or just one, (2) deciding whether to only teach SQL coding (Structured Query Language—the computer language used by the most popular databases) or to incorporate a GUI (Graphic User Interface [application]) into the course, (3) looking for free or open-source cross-platform GUIs, and (4) deciding what I want the students to achieve or produce by the end of the course.

1. **SQL database software.** Of the many relational database options available, three that are based on SQL are commonly used: MySQL, MariaDB, and PostgreSQL. MySQL is open-source and freely available, but it is owned by Oracle. With corporate backing comes many advantages, and the software is widely available and well maintained, but due to an earlier experience I had with changing paywalls while I was using FileMaker, I have a bias and suspicion against MySQL's corporate backing. MariaDB splintered from MySQL when it was acquired by Oracle. It has a large following and would make a good option for a student research database. I, however, use PostgreSQL for my own research database, so I decided to teach it. PostgreSQL is free and open-source with a long history of development. It is the preferred database for many scientific research projects, and, therefore, it is well supported on many university campuses.
2. **GUI vs. CLI.** Database software can run from either a command line using SQL or from an application. For a productive workflow, the vast majority of data input is more efficient when using a GUI (Graphic User Interface) application than when using the CLI (Command Line Interface). That said, I believe a user should know how to perform all SQL functions and operations using the CLI (or at least how to look them up). Most importantly a grasp of CLI is necessary to perform advanced and targeted searches of the data and to produce useful view-

tables in which relationally connected data can be brought together and queried. There are excellent free online tutorials and videos available to aid the students' learning of SQL through the CLI.

3. **Choosing a GUI.** The advances in recent years in GUIs that make data input and querying easy, is what allows students and scholars to efficiently perform their research in an SQL database environment. In the past, database software was generally only useful after a custom (web) GUI was developed by software engineers. Older general-purpose GUIs, such as PGAdmin (<https://www.pgadmin.org/>), were/are very useful for administrators monitoring the databases and server-side activity, including allocating user permissions to (parts of) databases. Now, however, many companies make available GUIs that are friendly (to variable degrees) for data input and querying. These have opened the world of SQL databases to the intermediate computer user for everyday use. Just like selecting any type of application, however, there are advantages and disadvantages to the different options available. For my teaching purposes, the biggest barriers were cross-platform compatibility (i.e. does the GUI work on Windows and mac?) and price. I use Postico (<https://eggerapps.at/postico/>) for my own research database, but this GUI is not free (although it is extremely reasonably priced) and is only available on mac. Some GUIs provide a free trial period but restrict features. I was looking for a GUI that (a) had a friendly graphic user interface that telescoped or teleported the user through the databases' foreign key relationships (i.e. the relationships among tables), (b) had a simple search field interface, (c) provided a graphical interface for importing and exporting CSV (Comma Separated Values) files - the universal spreadsheet file format - and (d) could handle rtl Unicode characters. The application Beekeeper Studio <https://www.beekeeperstudio.io/> is an excellent choice, though it does not provide a graphical interface for importing CSV files, and its ability to teleport the user through the foreign key relationships is limited to tables within the same schema (a schema is basically a folder into which tables may be grouped). The first drawback is remedied by the GUI Table Plus (<https://tableplus.com/>); the free version is greatly restricted, especially on Windows, but offers a useful CSV import feature. The second drawback to Beekeeper Studio, however, may force one to slightly alter the structure of their database, but despite this, it is an excellent teaching aid. Besides, I anticipated that the students would produce databases that would be altered or rebuilt as they move forward in their education and careers. Lastly, for the purposes of backing up their databases or for restoring databases from the class' models, they used PGAdmin.
4. **The students' databases.** I anticipated that the students would begin with a variety of levels in computing. In reality they began with virtually no knowledge of databases or coding. As one student expressed, "I had to come to terms with the label 'digital native' that I had been assigned." As with any new course, I had greater ambitions than were realistic, so early in the semester I had decided to focus on helping the students develop a working Bible manuscript database and showed them how to incorporate other ancient sources rather than walk them through the process of incorporating non-biblical sources. The course was offered in the theological faculty, so my choice to focus on Bible manuscripts seemed appropriate.

The students' databases included the following components:

- "documents" table - Foundational to the students' databases is a documents table in which biblical manuscripts are listed and assigned an id number (fig. 1).

id	doc_name
10001	Leningrad Codex B19a (BHS)
10002	Mosel Peshitta
10003	LXX (Ralphs)
10004	Vulgate
10005	Sahidic Coptic New Text (CorSahHorner)

Figure 1. List of Manuscripts

- "bible" schema - Each Bible manuscript's id number is assigned a table in the bible schema (fig. 2). For manuscripts like the Leningrad Codex, which is freely available in Unicode, the students formatted a CSV file in Excel or Numbers and imported it into the corresponding manuscript table. For manuscripts which are not yet digitized, the students were able to manually input the original text and translation.

```

bible
├── 000_bible_index
├── 10001
├── 10002
├── 10003
├── 10004
└── 10005
  
```

Figure 2. Bible Schema

- "lexicon" schema - Three tables are central to this schema, a "lexicon_base" table (fig. 3), a "concordance" table (fig. 4), and a "grammar" table (fig. 5). The lexical_base table serves as the students' own lexicon, which will grow over time. It has columns for a lexeme, meaning, notes, bibliography, and other linguistic features. It can be easily tailored for a full dictionary-type project, and at least one student expressed interest in developing their database in this direction in the future. The concordance table, the rows of which are automatically generated from a simple line of code, contains every individual word found in all manuscripts. Here the students will link each word to an entry in the lexicon. This process too can be mostly automated by creating a view-table specific to the genre or language of the newly entered text and then updating the concordance table, where the words of the new entries agree with those already assigned lexical id numbers. The words which the students wish to study in grammatical detail can be sent from the concordance table to the grammar table. There they can assign a complete grammatical analysis to each word. There is a place for students to leave general comments on any individual word on the concordance table or grammatical comments on individual words on the grammar table.

id	base	language	parsing1	parsing2	romanized	loanword	orig_lang_spelling	meaning
115	תרי, תרתי	2	2	4	תר, תרתי	(NULL)	(NULL)	two
174	עשרים	3	2	4	'eryn	(NULL)	(NULL)	twenty
173	מאתים	3	2	4	m"	(NULL)	(NULL)	one hundred
127	שלוש	2	2	4	šlwš	(NULL)	(NULL)	three
102	שלוש	1	2	4	šlwš	(NULL)	(NULL)	three
110	מדי	2	2	5	mdy	true	(NULL)	Mede
114	שתי	2	2	4	šny	(NULL)	(NULL)	sixty
121	עשרים	2	2	4	'eryn	(NULL)	(NULL)	twenty
120	מאה	2	2	4	m'h	(NULL)	(NULL)	one hundred
189	פ	2	2	11	p	(NULL)	(NULL)	paragraph break p
141	שלוש	3	2	4	šlwš	(NULL)	(NULL)	three
166	שבע	4	2	4	ep̄ta	(NULL)	(NULL)	seven
164	ἐκατόν	4	2	4	ekaton	(NULL)	(NULL)	one hundred
165	εἰκοσι	4	2	4	eikosi	(NULL)	(NULL)	twenty

Figure 3. Student Lexicon

word	no_vowels	lex_base_id	gram_id	name_id	doc_name	book	chapter	verse
כבר	כבר	113	106	(NULL)	Leningrad Codex ...	Dan	006	001
ודרש	ודרש	103	102	(NULL)	Leningrad Codex ...	Dan	006	001
והרתי	והרתי	115	109	(NULL)	Leningrad Codex ...	Dan	006	001
שתי	שתי	114	108	(NULL)	Leningrad Codex ...	Dan	006	001
פליטתא	פליטתא	112	105	(NULL)	Leningrad Codex ...	Dan	006	001
קבל	קבל	111	104	(NULL)	Leningrad Codex ...	Dan	006	001
פניא	פניא	110	103	(NULL)	Leningrad Codex ...	Dan	006	001
שתי	שתי	101	107	(NULL)	Leningrad Codex ...	Dan	006	001
לאישדרקניא	לאישדרקניא	103	118	(NULL)	Leningrad Codex ...	Dan	006	002
על	על	119	116	(NULL)	Leningrad Codex ...	Dan	006	002

Figure 4. Concordance Table

id	con_id	word	language	base_id	base	parsing1	parsing2	parsing3
101	1005916	ותן	1	100	נתן	1	1	2
102	1001956	ודרש	2	103	proper name	2	(NULL)	3
103	1001957	פניא	2	110	מדי	2	5	3
104	1001958	קבל	2	111	קבל	1	2	1
105	1001959	פליטתא	2	112	פליטתא	2	(NULL)	3
106	1001960	כבר	2	113	כבר	2	(NULL)	5
107	1001961	שתי	2	101	שתי	2	(NULL)	4
108	1001962	שתי	2	114	שתי	2	(NULL)	4
109	1001963	והרתי	2	115	תרי, תרתי	2	(NULL)	4
110	1005995	שתי	2	116	שתי	1	1	1
111	1039010	אא	4	153	אא	7	(NULL)	(NULL)
112	1039011	κατάστημα	4	163	κατάστημα	1	10	6

Figure 5. Grammar Parsing Table

- “commentaries” schema - The commentary is a place for students to make notes or compile bibliographies on any book, chapter, or verse in the Bible (fig. 6).

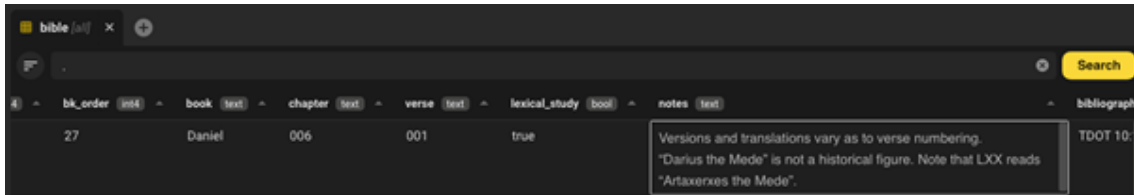


Figure 6. Student Bible Commentary

3.1. View-Tables

A powerful feature of relational databases is that data from any part of the database can be brought together with any other part in a view-table. These are tables that draw selected information from any one or more tables in the database into a single read-only table. The data can then be extensively queried.

By week seven, the students had a basic and working database on their own machines. In order to test the databases while we were developing them, students were required to read and parse verses along the way as though they were in a language learning class. For our course we focused on Biblical Aramaic and read sections of Daniel and Ezra in Aramaic, Syriac, and Greek. We prepared the texts of the Leningrad Codex, the Peshitta, and the LXX in their respective tables. Then I instructed the students on how to create a view-table that orders data from the individual Leningrad Codex, the Peshitta, and the LXX tables by verse. The result was an interlinear digital Bible view-table (fig. 7). The table is searchable, and students are able to find strings of letters with or without vowels in Syriac or Aramaic or with or without accents and breathing marks in Greek. In a second window they could work on their concordance of the assigned verses, and in a third window they could grammatically label each word.

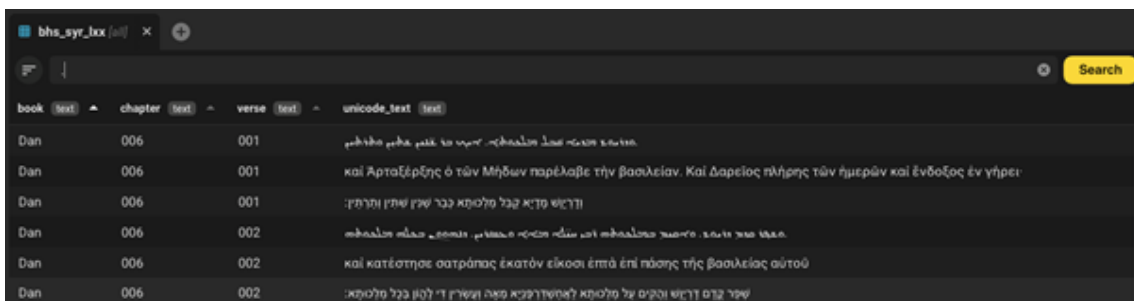


Figure 7. Manuscripts in Parallel View-Table

As an assignment one week they were asked to create a second and more complicated view-table. This would transform their grammatical table, which relies on 16 daughter tables, into an easy-to-read and searchable parsing chart (fig. 8). They could then simply share their parsings of assigned verses in CSV format for comparison (or for grading if the instructor desires). Obviously, they can also search individual words by any grammatical combinations they wish.

Word	Manuscript	Bk	Chap	Vs	Base	Language	Meaning	Part of Speech	Parsing
מדי	Leningrad Codex ...	Dan	006	001	מדי	Aramaic	Mede	noun	gentilic / eth
קבל	Leningrad Codex ...	Dan	006	001	קבל	Aramaic	G-stem: draw near...	verb	D-stem
בין	Mosel Peshitta	Dan	006	002	בין	Syriac	before	preposition	prep (indep)
ד, ת	Leningrad Codex ...	Dan	006	002	ד, ת	Aramaic	which, that, who, ...	pronoun	pronoun (rel)
מאת	Mosel Peshitta	Dan	006	002	מאת	Syriac	one hundred	noun	numeral
επτά	LXX (Ralphs)	Dan	006	002	επτά	Greek	seven	noun	numeral
מאת	Leningrad Codex ...	Dan	006	002	מאת	Aramaic	one hundred	noun	numeral

Figure 8. Advanced Grammar View-Table

I further showed the students how they could reverse engineer the manuscripts in a view-table using the concordance, so that they may search by lexical bases rather than exact spellings. This allows them to find adjacent syntactical features, such as some idiomatic constructions. For example, in this view-table they could type in "על קום" and get back every verse in the database, no matter how the verbal root "קום" is conjugated or spelled.

Bk	Chap	Vs	Text
Dan	006	002	שאר בדם דראש יקום על מלכותא לאישורא משה וישאר ד לכו בגל מלכותא

Figure 9. View-Table. Reverse Engineered from Lexical Bases for Advanced Searches

In only a semester with other tasks to complete, we stopped our build at this point, and worked on fine-tuning it and developing a workflow. Besides the benefit of learning a computer language and a little code, using an SQL database is significantly easier and less time-consuming than marking up XML files. I nonetheless showed the class how PostgreSQL contains an XML data type that will maintain the integrity of such lines of code should the students develop their databases along those lines. Certainly, to achieve more complex syntactical searches, XML tagging would be of value, but apart from highly specified project work, one must weigh the time spent producing XML files against the value of their usability.

While students were fine-tuning their databases and workflow by regularly preparing verses for class, I continued to use 30–50% of the class time to discuss how to incorporate bibliographies (such as from Zotero) and photographs into their databases. We also discussed the types of digital photography used in ancient studies (e.g., Hi-def scans, IR, multispectral, RTI) and the pros and cons of these formats for personal, group, or large project research. We ended the course with a discussion of full stack development, in particular the PERN (PostgreSQL, Express, React, and Node.js) stack. The goal of these modular discussions was to inform students of the major working components of most modern research projects.

4. Teaching Conditions

I was fortunate to test this course under fairly ideal conditions. The class size was extremely small, three very good students, which allowed for a true workshop environment to develop. The class could function well with around 10 students or with 11+ students, if teaching assistants and/or workshop hours were added to it. That I taught this class online during COVID pandemic restrictions had, in some measure, benefits over the traditional classroom setting. I was able to easily record the meetings so

that students could review them later, and students were able to share their screens to present their work or troubleshoot. Student feedback showed that recorded sessions were key to their success, especially during the database build. In this regard, there is no advantage to holding a face-to-face class in a brick-and-mortar setting for most lessons. That said, there would be an advantage to face-to-face troubleshooting workshops 2–4 times throughout the semester.

Factors that must be considered when teaching a digital course are the university's network and security restrictions. One student was attending from a university in our consortium and did not have credentials for the VPN on which my university's database servers are kept. After various attempts to find a workaround that would easily allow students to access a model database built on my university's resources, the solution proved too complicated for novice students in the end. It was simply not possible to allow them to create a network database, which I could easily help troubleshoot, as I had originally planned. Instead, students created their databases on their own machines. The drawback to this is that they were initially bogged down with learning how to install, spin up, and connect to their own databases, which can be overwhelming to the novice.

I found it useful to create a backup copy of the database each week and to create a new database for the next week. After each class session, I would create a database dump, date it, and make it available to students. I would then prepare the steps for the next week's work. This allowed me to have on hand copies of each stage of the build from each week. These versions of the database came in handy more than once throughout the course. When a student would make a significant error, they were able to simply restore their database from the latest class session and continue from there.

5. Results

The course was a great success and produced Bible and ancient studies students who can easily join, adapt to, or perhaps propose a project that is producing digital editions. It also helped the students develop a digital work ethic. If they continue to develop and use their databases throughout their education and into their professional careers, they will have a repository of their cumulative work and knowledge that is easy to query, adapt, and share.

I think in the end a clear argument can be made that a digital editions course should be included in biblical and ancient studies programs as a foundational methodologies course. In my view, it should be offered to undergraduate students and mandatory for graduate students. The only prerequisite is that students need a working knowledge of one ancient language—ideally one in which the teacher is proficient. Students informed me that during the three most difficult weeks, early in the build, they spent between 5–8 hours working on their databases. This fell in the middle of the semester and did not disrupt final examination preparation. I did not require a final project or paper, but theoretically one could be assigned.

While I designed the course for text-based educational programs, a version could be offered that prioritizes archaeology and artifact analysis. *The point to be made is that a course on digital editions provides students with foundational skills in the medium of the modern era.* These skills make students more valuable candidates in their future careers, both in and outside the academy. Academic programs spend one or more semesters teaching students field-specific methodologies, which are normally antiquated and hardly retained. Why not use some of that time to teach students the skills that are necessary for cutting-edge research in biblical and ancient studies and which translate to a variety of positions in the workforce?

I am fortunate to work in a faculty that supports experimental learning and innovative research, but hopefully institutions and hiring committees will discover the value of teaching modern digital skills to students as part of their core curriculum and as an integrated part of research in the modern humanities.



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Hebrew Major Curriculum Map

Course:	Goal 1: Students Acquire intermediate language competency (Reading, Writing, Listening, Speaking).	Goal 2: Students Acquire Familiarity with Jewish and/or Israeli cultures and communities.	Goal 3: Students read and interpret critically a diverse range of Hebrew and/or Jewish texts
Prerequisites			
Hebrew 1101	Beg.	Beg.	Beg.
Hebrew 1102	Beg.	Beg.	Beg.
Hebrew 1103	Beg. /Int.	Beg.	Beg.
Required Courses			
Hebrew 2105: Intermediate Hebrew II	Int.	Beg./Int.	Beg. /Int.
Hebrew 2216: The Medieval Jewish Experience		Beg.	Beg.
Hebrew 2700: Bible in the Ancient Near East		Beg.	Beg./Int.
Jewish Studies 2201: Introduction to Jewish Cultures, Thought and Practice	—————	Beg.	Beg.
History 2450: Ancient and Medieval Jewish History		Beg./Int.	Beg.
History 2451: Medieval and Early Modern Jewish History		Beg/Int.	Beg.
History 2452 Modern Jewish History		Beg. /Int.	Beg.
History 2453: History of Zionism and Modern Israel		Beg/Int.	Beg.
Required for Language Track		Beg/Int.	Beg.
Hebrew 4101: Advanced Hebrew	Adv.	Int.	Int.
Hebrew 5100 Introduction to Biblical Hebrew	Int.	Int.	Int.
Electives in NELC			
Hebrew 3245 Israeli Film and Society		Beg./Int.	Int.
Jewish Studies 3636 Jewish Bodies		Beg/Int.	Beg/Int.
Hebrew 3703 Prophecy in the Hebrew Bible		Int.	Beg/Int.
Hebrew 3704 Women in the Bible and Beyond		Beg.	Int.
Hebrew 3705 Holocaust and Israeli Society		Int.	Int.
Hebrew 3708 Wisdom Literature in the Bible		Int.	Beg./Int.
Hebrew 4102: Hebrew and the Media	Int.	Int.	Int.

Hebrew 4601: Modern Hebrew Short Story	Adv.	Int.	Adv.
Hebrew 4602 Modern Hebrew Poetry	Adv.	Int.	Adv.
Hebrew 4605 Introduction to Rabbinic Literature	Adv.	Int.	Int.
5101: Biblical Hebrew Grammar	Adv.	Int.	Adv.
Hebrew 5105: History of the Hebrew Language	Adv.	Int.	Int.
Hebrew 5601: Introduction to Hebrew Literary and Cultural Texts	Adv.	Adv.	Adv.
Hebrew 5602: The Bible as Literature: Selected Readings	Adv.	Adv.	Adv.
Hebrew 5603: Readings in Rabbinic Literature	Adv.	Adv.	Adv.
Hebrew 5802: The Problem of Evil in Biblical and Post- Biblical Literature	Beg.	Adv.	Adv.
Hebrew 5806: Studies in Biblical Law	Beg.	Adv.	Adv.
Hebrew 4998: Undergraduate Research	Adv.	Adv.	Adv.
Hebrew 4998H: Undergraduate Honors Research	Adv.	Adv.	Adv.
Hebrew 4999H: Undergraduate Thesis	Adv.	Adv.	Adv.
Hebrew 4999H: Undergraduate Honors Thesis	Adv.	Adv.	Adv.
Hebrew 5192: Workshop	Int.	Int.	Int.
Hebrew 5193: Individual Studies	Int. /Adv.	Int. /Adv.	Int. /Adv.
Hebrew 5194: Group Studies	Int. /Adv.	Int. /Adv.	Int. /Adv.
Hebrew 5797 Study at a Foreign Institute	Int. /Adv.	Int. /Adv.	Int. /Adv.
Jewish Studies 3205 Art and Judaism		Int.	Int.
Jewish Studies 3209 World of the Rabbis		Int.	Int.
Jewish Studies 3516 Medieval Jewish Experience		Int.	Int.
Jewish Studies 3210 Jewish Mystical Tradition		Int.	Int.
Jewish Studies 3120 Engaging Time		Int.	Int.
NELC 4601: Israeli & Palestinian Literature		Int.	Int.
NELC 5120 Biblical Aramaic	Int.	Int.	Int.
NELC 5121 Jewish Aramaic	Int.	Int.	Int.

NELC 5145 Digital Editions of Ancient Texts and Artifacts			Adv.
Electives Outside NELC			
History 3218 Paul and His Influence on Early Christianity		Int.	Int.
History 3219 Historical Jesus		Int.	Int.
History 3353 Jewish Communities Under Islamic Rule		Int.	Int.
History 3450 History of Ancient Israel		Int.	Int.
History 3455 Jewish Life from the Early Renaissance to the Early Enlightenment		Int.	Int.
History 3460 European Jewish History I		Int.	Int.
History 3465 American Jewish History		Int.	Int.
History 3470 Messiahs and Messianism in Jewish History		Int.	Int.
History / Jewish Studies 3480		Int.	Int.
History 5613 The American Jewish Experience		Adv.	Adv.
Philosophy 3111 Introduction to Jewish Philosophy		Beg/Int	Beg/Int
Philosophy 3351 Judaism and Ethics		Int	Int.
Philosophy 5870 Topics in Jewish Philosophy		Adv.	Adv.
Political Science 4327 Politics in the Middle East		Adv.	Int.
Yiddish 3371 Yiddish Literature in Translation		Int.	Int.
Yiddish 3399 Holocaust in Yiddish and Ashkenazic Literature and Film		Int.	Int.
Yiddish 4401 Advanced Yiddish I		Int.	Beg.
Yiddish 4402 Advanced Yiddish II		Int.	Beg.
Yiddish 4721 Studies in Yiddish Literature		Int.	Adv.