


CSC 3022 Syllabus

	Mathematical, Information, and Computer Sciences CSC 3022: Data Management for Computational Science Units: 2 Meeting: TR 12:25-1:20 Rohr Science 395
	Fall 2023 August 28-December 10

Instructor: Dr. Mike Leih, Ph.D.
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Dr. Leih is available at these times for Office Hours: T,Th 9:30 am - 11:30 am (Except on occasion when other activities have been unavoidable - Check Google Calendar for current office hours each week) Anytime as needed, and I am available via Zoom. Please check Google Calendar to find an available time and request a meeting.
Final Exam: December 14, 2023 at 1:30 pm

PLNU MISSION

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

DEPARTMENT MISSION



The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

COURSE DESCRIPTION

An introduction to data management in the context of scientific research. Students will explore the data storage and manipulation requirements for biology, chemistry, and physics and learn to choose the correct data management tool for a given situation. Tools include Microsoft Excel (with VBA), Visual Basic, and Microsoft Access. Students will learn to design, create, and query relational databases using the SQLite DBMS and SQL query language.

In addition, students will gain experience with data cleaning, HTML, and JavaScript. Students will be exposed to ethical dilemmas which they might encounter in future work along with ways to uncover and deal with them.

COURSE ORGANIZATION

Class time will be a mixture of discussion and lab time. The majority of points earned in the course will result from coming to class prepared to participate and complete lab work that can be demonstrated in class.

COURSE LEARNING OUTCOMES

1. Students will understand how data is used in their specific scientific field
2. Students will be able to recommend the correct data management tool (spreadsheet, flat file, database, ETL process, ...) to use for a particular scientific application

3. Students will be able to build a basic RDBMS and create basic queries
4. Students will gain practice loading and configuring software
5. Students will be able to recognize unclean data and make informed choices on how to clean it
6. Students will consider ethical issues with data management

PROGRAM LEARNING OUTCOMES

1. Students will become conversant in computational research tools in the context of scientific problems.
2. Students will improve their ability to leverage statistics, scripting, and data management to complete scientific research better.
3. Students will become aware of computational techniques to solve research problems.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Collect, Combine, and Transform Data Using Power Query in Excel and Power BI
Gil Raviv Microsoft Press; 1st edition (October 25, 2018)
ISBN-13 : 978-1509307951

Additional reading and study material will be provided in class.

COURSE CREDIT HOUR INFORMATION

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 2 unit course delivered over 15 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request. (Based on 37.5 hours of student engagement per credit hour.)

Distribution of Student Learning Hours

Assignment	Hours
Online Videos, Reading and Labs	30
Lectures and class activities	30
Submitted work	10
Written Exams and quizzes including preparation	5
Total	75

ASSESSMENT AND GRADING

Graded Components

Prepared for Class: Before each class session, students will be given work to complete and concepts to research as part of class participation. Students who attend class and can demonstrate their respective assigned activities in class will be awarded full credit for class on that day. Students who are not fully prepared will earn less than full credit and possibly no credit for the class session. A missed class session will result in zero points for the day. Each Quad, students will be given two grace days where they may choose to earn full credit for a day they might not have been able to fully prepare for or a day which they missed class.



Tests: There will be a test given after each major module in the course. These tests will be assessed and reviewed and assist students in preparing for the Midterm and Final exam.

Midterm: The midterm is scheduled for **October 12** and will cover all lecture, discussion, and lab material to that point. These may have "how-to" questions, but will also ask questions about the appropriateness or ethical use of a particular tool. If you will miss the midterm for a school function, you must arrange to take it in advance. If you miss the exam without giving prior notice, there is a good chance you will receive a zero unless, of course, there was clearly an emergency.

Final Exam: The cumulative final exam is scheduled for the Thursday of finals week at 1:30. It will contain questions similar to those on both the midterm and tests.

Grading Distribution	Percent
Class participation and Assignments	55
Tests and Midterm	20
Final Exam	25

Total	100
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Grading Scale

The grading scale for the course, in percentages of the maximum points in class is:

A	92.50 - 100%	C	72.50 - 77.49%
A-	90.00 - 92.49%	C-	70.00 - 72.49%
B+	87.50 - 89.99%	D+	67.50 - 69.99%
B	82.50 - 87.49%	D	62.50 - 66.49%
B-	80.00 - 82.49%	D-	60.00 - 62.49%
C+	77.50 - 79.99%	F	0 - 59.99%

STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization \(https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures\)](https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures) to view which states allow online (distance education) outside of California.


INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the date indicated on Canvas. Incompletes will only be assigned in extremely unusual circumstances.

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the  of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies \(http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278\)](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278) for definitions of kinds of academic dishonesty and for further policy information.

ARTIFICIAL INTELLIGENCE (AI) POLICY

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, iA Writer, Marmot, Botowski) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course unless explicitly called for in the assignment instructions. If you have any doubts about using AI, please gain permission from the instructor.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu (mailto:EAC@pointloma.edu) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university withdrawal date or, after that date, receive an "F" grade.

FINAL EXAM DATE AND TIME

The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week is an instructor authorized to consider changing the exam date and time for that particular student. The cumulative final exam is scheduled for **December 14, 2023 at 1:30 pm**

FINAL EXAM POLICY

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the <http://www.pointloma.edu/experience/academics/class-schedules> **Class Schedules** (<http://www.pointloma.edu/experience/academics/class-schedules>) site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

CLASS ENROLLMENT:

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

SPIRITUAL CARE

Please be aware PLNU strives to be a place where you grow as a whole person. To this end, we provide resources for our students to encounter God and grow in their Christian faith. If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development](https://www.pointloma.edu/offices/spiritual-development) (<https://www.pointloma.edu/offices/spiritual-development>)

Expected Schedule

Wk	Week of	Tuesday	Thursday
1	8/28/2023		First class
2	9/4/2023	Excel DM - week 1 and 2	Excel DM - week 1 and 2
3	9/11/2023	Excel DM - week 3 and 4	Excel DM - week 3 and 4
4	9/18/2023	Excel DM - week 5 and 6	Excel DM - week 5 and 6
5	9/25/2023	Excel DM exam and wrap up	Excel VBA - week 7
6	10/2/2023	Excel VBA - week 8	Excel VBA - week 8
7	10/9/2023	Excel VBA - Custom Prob	Mid Term
8	10/16/2023	Excel Power Query / SQL Ch 1	Fall Break
9	10/23/2023	Excel Power Query / SQL Ch 2	Excel Power Query / SQL Ch 2
10	10/30/2023	Excel Power Query / SQL Ch 3	Excel Power Query / SQL Ch 3
11	11/6/2023	Excel Power Query / SQL Ch 4	Excel Power Query / SQL Ch 4
12	11/13/2023	Excel Power Query / SQL Ch 5	Excel Power Query / SQL Ch 5
13	11/20/2023	Excel Power Query / SQL Ch 6	Thanksgiving
14	11/27/2023	Excel Power Query / SQL Ch 7	Excel Power Query / SQL Ch 7
15	12/4/2023	Excel Power Query / SQL Ch 8	Presentations
16	12/11/2023		Final



