POINT 1902 LOMA
NAZARENE UNIVERSITY

Mathematics Information and Computer Sciences (MICS)/STEM

CSC 3022 - Data Management for Computational Science (2 units)

Fall 2026
Meeting days/times: MW 12:15 am - 1:10 pm
Meeting location: Ryan Learning 108
Final Exam: Monday, December 14th, 10:30 am - 1:00 pm

Course Information	Specifics for the Course
Instructor title and name:	Professor Noah Spahn
Phone:	x2401
Email:	nspahn@pointloma.edu
Office location and hours:	Rohr Science 210: signup form

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.

MICS 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 that they might encounter in future work, along with ways to uncover and deal with them.

Program and Course Learning Outcomes

Graduates of the program will be able to:

- demonstrate general knowledge of theories and practices in the core areas of business.
- critically analyze and apply business knowledge to solve complex business situations.
- demonstrate effective business communication through both written and verbal means.
    - Students will be able to speak about their work with precision, clarity and organization
    - Students will be able to write about their work with precision, clarity and organization
    - Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
- formulate decisions informed by ethical attitudes and values.
- collaborate effectively in teams.
- write correct and robust software.
- analyze the interaction between hardware and software.
- apply their technical knowledge and critical thinking to solve problems.
- understand and create arguments supported by quantitative evidence.
- understand the professional, ethical, and social issues and responsibilities with the implementation and use of technology.

Course Learning Outcomes (CLOs):

Upon successful completion of this course, students will be able to:

1. **Describe** how data is used in their specific scientific field
2. **Recommend** the appropriate data management tool (spreadsheet, flat file, database, ETL process, etc.) for a particular scientific application
3. **Build** a basic RDBMS and **write** basic queries
4. **Install and configure** data management software
5. **Recognize** unclean data and **make informed choices** about how to clean it
6. **Evaluate** ethical issues in data management

Required Texts and Recommended Study Resources

All supplemental materials posted on this course site (including articles, book excerpts, or other documents) are provided for your personal academic use. These materials may be protected by copyright law and should not be duplicated or distributed without permission of the copyright owner.

- **Modern Data Analytics in Excel**, by George Mount
  ISBN: 9781098148812
- **Data Modeling with Microsoft Power BI**, by Markus Ehrenmueller-Jensen
  ISBN: 9781098148546

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 class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework.

Assessment and Grading

Grades will be based on the following:

A	B	C	D	F
A 93-100	B+ 87-89	C+ 77-79	D+ 67-69	F Less than 59
A- 90-92	B 83-86	C 73-76	D 63-66	
	B- 80-82	C- 70-72	D- 60-62	

Final Examination Policy

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the Traditional Undergraduate Records: Final Exam 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.

PLNU Artificial Intelligence (AI) Policy

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro, GrammarlyGo, Perplexity, etc.) to generate ideas, as a learning tool, or in some cases generate portions of work you will submit. I will specify in individual assignments what constitutes

appropriate use of AI for that assignment. Please use this Purdue resource to guide your citations when using AI.

Incompletes and Late Assignments

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center, by email or phone at 619-849-2533. Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines approved accommodations. Professors are able to view a student's approved accommodations through Accommodate. PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their approved accommodations in that particular course. Accommodations are not retroactive; as such, clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.
Students who need accommodations for a disability-related need should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. In accordance with ADA, accommodations cannot constitute a fundamental alteration to course outcomes; therefore, planning ahead is vital in establishing appropriate accommodations for equal access to this course. It is the student's responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC eligibility process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any accommodations.

LomaBooks Instructions for Students

This course is part of our course material delivery program, **LomaBooks**. The bookstore will provide each student with a convenient package containing all required physical materials; all digitally delivered materials will be integrated into Canvas.
You should have received an email from the bookstore confirming the list of materials that will be provided for each of your courses and asking you to select how you would like to receive any printed components (in-store pick up or home delivery). If you have not done so already, please confirm your fulfillment preference so the bookstore can prepare your **LomaBooks** materials.

Additional Course Information

Additional PLNU policies and practices that apply to this course can be found at the TUG Syllabus policy portion doc.

CSC 3022 - Data Management for Computational Science

MW | 12:15 PM - 1:10 PM Ryan Learning 108

Week	Monday	Wednesday
1	**Aug 31: Course Onboarding** • Introductions, syllabus walk-through, and software setup (Excel/Power BI)	**Sept 2: Modern Excel Landscape** • What is "Modern Excel"? • Working with local raw datasets
2	***Sept 7: Labor Day*** *• No Class Session Scheduled (University Holiday)*	**Sept 9: Cleaning Data at the Source** • Mount Chapter 1 (Power Query Basics) • **Project 1: Excel Topic Proposal Due**
3	**Sept 14: Structural Data Transformations** • Mount Chapter 2 (Power Query Transformations) • Unpivoting, merging, and appending tables	**Sept 16: Transforming Personal Datasets** • Power Query applied to selected student data • **Project 1: Data Source Verification Due**
4	**Sept 21: The Data Modeling Shift** • Mount Chapter 3 (The Data Model) • Moving past VLOOKUP to relationships	**Sept 23: Calling and Career in Data** • Interactive Discussion: Vocational alignment, tech trends, and career paths
5	**Sept 28: Analytical Foundations** • Mount Chapter 4 (DAX Basics) • Writing implicit vs. explicit measures	**Sept 30: Modeling Project Data** • Peer review of Project 1 data relationships • **Project 1: Midpoint Model Checkpoint Due**

6	**Oct 5: Time Intelligence and Filters** • Mount Chapter 5 (Intermediate DAX) • CALCULATE, DIVIDE, and Date tables	**Oct 7: Midterm 1 Synthesis** • Review Session: Practical sandbox challenge drills and core terms matrix review
7	**Oct 12: Evaluation Window** • **Midterm Exam 1** (Chapters 1-5; Mixed paper/practical)	**Oct 14: Pivot Tables Reimagined** • Mount Chapter 6 (Pivot Tables on Data Models) • **Project 1: Excel Workbook Due**
8	**Oct 19: Visual Presentation of Data** • Mount Chapter 7 (Data Visualization Rules) • **Project 2: Relational Topic Proposal Due**	**Oct 21: Dynamic Reporting Frameworks** • Mount Chapter 8 (Interactive Dashboards) • Building user-friendly interfaces
9	**Oct 26: Designing Relational Blueprints** • Case Lab: Drafting Entity-Relationship Diagrams (ERDs) for Project 2 • **Project 2: Relational Schema Draft Due**	**Oct 28: Modern Excel Ecosystems** • Mount Chapter 9 (Power BI Integration & Cloud) • Moving workbooks to cloud workspaces
10	**Nov 2: Exploring Relational Datasets** • Mount Chapter 10 (Dynamic Array Formulas)	**Nov 4: AI & Automation in Modern Excel** • Mount Chapter 11 (AI Tools, Forecasting, CoPilot) • Quick Insights and automated scanning
11	**Nov 9: Project 2 Progress Review** • Checkpoint Session: Verifying calculations and joins in Power BI • **Project 2: Midpoint Calculation Draft Due**	**Nov 11: Enterprise Data Modeling Principles** • Dimensional Modeling Fundamentals (Star vs. Snowflake schema) • Reading: Ehrenmueller-Jensen Core Principles
12	**Nov 16: Midterm 2 Synthesis** • Review Session: Sandbox practical drills on data connections and DAX	**Nov 18: Evaluation Window** • **Midterm Exam 2** (Chapters 6-11; Mixed paper/practical)

13	**Nov 23: Granularity & Relationships** • Resolving many-to-many relationship issues • Reading: Ehrenmueller-Jensen Chapter 4 & 5 Concepts	***Nov 25: Thanksgiving Recess*** *• No Class Session Scheduled (University Break)*
14	**Nov 30: Visual Polish & Peer Audits** • Project Session: UI/UX alignment in Power BI reports • Peer review of project report aesthetics	**Dec 2: Career & Professional Showcase** • Roundtable: Presentation of individual vocational portfolios
15	**Dec 7: Relational Presentation Showcase** • Project Presentations: Classroom presentation of Project 2 modeling designs • **Project 2: Final Report & Power BI Model Due**	**Dec 9: Course Epilogue & Final Review** • Comprehensive review and final exam preparation
Final	**Official University Final Exam Window** Monday, December 14 | 10:30 AM - 1:00 PM Comprehensive Course Final Examination	