Point Loma Nazarene University
CSC 322: Data Management for Computational Science
(2 units)
Fall 2017

Instructor:

Dr. Lori Carter, Professor of Computer Science   (619) 849-2352

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Office hours:

M,W,F 8:30-9:30, 10:30-12:00   TR 8:30-9:30, 1:30-2:00

Meeting Times and Location:

TR 12:25-1:20   RS13

Text:

None

Additional Supplies:

Raspberry Pi, Power Supply, Software

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.

Course Learning Outcomes

- Students will understand how data is used in their specific scientific field
- Students will be able to recommend the correct data management tool (spreadsheet, flat file, database, scripting language, or other) to use for a particular scientific application
- Students will be able to build a basic RDBMS and create basic queries
- Students will gain practice loading and configuring software
- Students will consider ethical issues with data management

Course Organization:

Class time will be divided between lecture and lab.

Lectures: Student versions of the lecture slides can be obtained from canvas.pointloma.edu. These slides will contain homework assignments and due dates.

Labs and homework: Labs and homework are to be completed on an individual basis unless otherwise stated. Points for lab assignments that look too similar will be divided between the participants. When

working in groups, all group members must be at all lab meetings where the lab is worked on. Labs are due within the first 5 minutes of the class meeting given by the due date and late labs are not accepted. Partial credit can be awarded on incomplete labs turned in on time.

Presentation: Each student will be required to give a presentation on the use of a data management tool **talked about in this class** in the context of their major. Presentations will be given during the final week of classes, or possibly on the day of the final exam.

Exams: There will be 2 exams. If you will miss an exam for a school function, you must arrange to take it in advance. If you ever miss an exam without giving me prior notice, there is a good chance you will receive a zero unless, of course, there was clearly an emergency. Exam content can include material from lectures, articles, labs, and homework. Exam 1 is scheduled for **Oct. 12**. It will include all material covered to that point. Exam 2 is scheduled for **Nov. 16** and will cover all material to date, but will emphasize material covered since the first exam.

Final Exam: The final exam is scheduled for the Thursday of finals week at 1:30.

Grading:

Homework and Labs	40%
Exams	30%
Final Exam	20%
Final Presentation	10%

Final grades will be determined as follows:

100-93%	A	80-82%	B-	67-69%	D+
90-92%	A-	77-79%	C+	63-66%	D
87-89%	B+	73-76%	C	60-62%	D-
83-86%	B	70-72%	C-	0-59%	F

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 you will spend a minimum of 37.5 participation hours per credit hour in your course. The estimated time expectations for this course are shown below:

Assignments	Total Course Hours
Reading: Papers and Notes	15
Written Assignments	7
Lectures	20
Labs and Lab assignments	28
Written and Programming Exams	5
TOTAL	75

University Mission:
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.

Attendance:
Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. In the Undergraduate Academic Catalog please see http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_Attendance

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.

Academic Accommodations:
If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information. For more details see the PLNU catalog:
http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Accommodations

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty:
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 results 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 http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

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.

Copyright Protected Materials:
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.

Anticipated Schedule

Monday	Tuesday	Wed	Thursday	Friday
	Aug 29	30	31 Syllabus, exercise on Data management	1
Sept 4 Labor day	5 Discuss DM, Excel	6	7 Excel labs	8
11	12 Discuss Excel labs, lecture on VB	13	14 VB lab	15
18	19 Lecture on VBA	20	21 VBA exercise, lab	22
25	26 Intro to Access and relational DBs	27	28 Access labs 1,2	29
Oct 2	3 Access forms, reports, dashboard	4	5 Access lab 3	6
9	10 Review	11	12 Exam 1	13
16	17 Introduce SQL, SQLite	18	19 Install SQLite and do SQL lab 1	20 Fall Break
23	24 Loading data from text files, where command, view	25	26 SQLite lab 2	27
30	31 pattern matching, Aggregate functions	Nov. 1	2 SQLite lab 3	3
6	7 In-class exercises	8	9 Joins and referential integrity Join Lab	10
13	14 Normalization, Normalization exercise	15	16 Exam 2	17
20	21 Data Cleaning	22 Thanks giving	23 Thanksgiving	24 Thanks giving
27	28 Ethics and data management	29	30 Work on projects	Dec 1
4	5 Ethics and Data Management Presentations	6	7 Data Management Presentations	8
11	12	13	14 Final exam 1:30	15