

MTH2092

Applied Project in Data Science

(2 units)

Fall 2021

Meeting days: **TR**

Meeting times: **10:00-10:55 am**

Location: **RS295**

Final Exam: **10:30 am – 1:00 pm on**

Tuesday December 14th, 2021

Instructor: **Professor Greg Crow, Ph.D.**

Phone: **619.849.2604**

Email: gcrow@pointloma.edu

Office location: **RS252**

Office hours: **Posted in Canvas**

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: (from the Catalog)

MTH 2092 (2 Units) Applied Project in Data Science

This course introduces students to the complete data science process. Students will work in teams to scope a real-world problem, gather data to answer the question, wrangle the data, model it, validate the models, draw conclusions and communicate results. The course includes study of the principles of data science and technical communication. This course will integrate prior cross-disciplinary coursework and introduce students to the basics of scripting and integrating tools into full-stack solutions.

Prerequisite(s): MTH 2074 with a grade of C- or higher.

Course Learning Outcomes

- Students will be able to apply their mathematical knowledge to solve problems.
- Students will be able to use technology to solve problems.
- Students will be able to write correct and robust software.
- Students will be able to apply their technical knowledge to solve problems.

Required Texts and Recommended Study Resources

Text Book: *R for Data Science*.
Hadley Wickham and Garrett Grolemund.
2017. ISBN: 9781491910399

Statistical Software: Excel or R and RStudio installed on your device

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. For this course, students will spend an estimated 75.5 total hours meeting the course learning outcomes. The time estimations are provided below.

Component	Total Hours
Classes (20 at 1 hour each)	20
Data Preparation and Analysis	43
Portfolio Creation, Editing, and Polishing	10
Portfolio Presentations (Final Summative Experience)	2.5
Total	75.5

Assessment and Grading

Course Format

Mathematics is learned by doing. This course has intentionally been designed to develop both statistical understanding and practical implementation. You are encouraged to work with each other, however, you are responsible for the material and simply copying answers will be to your detriment. You will be required to install the software (R and RStudio) on your own computer or use a computer lab copy during the assigned sessions.

Homework and Late Submission Penalties

The homework is a portfolio that demonstrates your understanding of the topics in the course. The first draft of the portfolio will be submitted on or before Thursday 28-Oct-2021. The completed portfolio will be submitted on or before Tuesday 7-Dec-2021. Late submission of a portfolio will be assessed a $2^{n-1} \times 10\%$ deduction where n = the number of weekdays late. The day counter for late work begins at the start of class on the weekday it is due. For example, a portfolio submitted at 10:15 am on the first weekday after the due date will incur a two-day late penalty deduction of 20%.

Final Examination:

There will be two Mid-Semester Examinations and a comprehensive Final Examination. Both Mid-Semester Examinations and the Final Examination will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. The examination schedule is included in the daily schedule. The instructor will not accept excuses such as poor communication with parents, benefactors, surf team sponsors and/or travel agents. No examination shall be missed without prior consent or a well-documented emergency beyond your control. In such cases, all make-up exams will occur at 8:30 am on the Saturday between classes and Final Exam week. A score of zero will be assigned for an examination that is missed without prior consent or a well-documented emergency beyond your control. The Lab Final Examination will be included as 1/5th of the Final Examination score.

Grade Components:

Grade Component	Percent
First Draft of Portfolio	25
Portfolio	50
Final Exam	25
Total	100

Grading Scale:

Grades are based on the number of points accumulated throughout the course with the following exception. Approximate minimal percentages required to obtain a given grade are:

Grading Scale in percentages	A	B	C	D
+		(87.5, 90.0)	(77.5, 80.0)	(67.5, 70.0)
	[92.5, 100]	[82.5, 87.5]	[72.5, 77.5]	[62.5, 67.5]
-	[90.0, 92.5)	[80.0, 82.5)	[70.0, 72.5)	[60.0, 62.5)

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](#) to view which states allow online (distance education) outside of California.

Incompletes and Late Assignments

The homework is a portfolio that demonstrates your understanding of the topics in the course. The first draft of the portfolio will be submitted on or before Thursday 28-Oct-2021. The completed portfolio will be submitted on or before Tuesday 7-Dec-2021. Late submission of a portfolio will be assessed a $2^{n-1} \times 10\%$ deduction where n = the number of weekdays late. The day counter for late work begins at the start of class on the weekday it is due. For example, a portfolio submitted at 10:15 am on the first weekday after the due date will incur a two day late penalty deduction of 20%. 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 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 [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

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 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 drop date or, after that date, receive the appropriate grade for their work and participation.

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 whole persons. 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](#).

Use of Technology

In order to be successful in the online or hybrid environment, you will need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](#) information. Additionally, students are required to have headphone speakers, microphone, or webcams compatible with their computer available to use. Please note that any course with online proctored exams require a computer with a camera (tablets are not compatible) to complete exams online.

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

Final Exam: Tuesday December 14th, 2021 from 10:30 am – 1:00 pm

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 Final Exam is a comprehensive examination.

Schedule:

Week 1	Orientation & Data set selection
Week 2	Submission of Data set for approval by the Professor
Weeks 3-8	Lectures on Regression and Estimation Models Data Preparation, Analysis, and Portfolio Creation
Week 9	First Draft of Portfolio Submitted

Week 10-14 Lectures on Regression and Estimation Models
Data Preparation, Analysis, and Portfolio Creation
Week 15 Final Portfolio Submitted
Finals Week Presentation