MTH4053 (3 units) Advanced Applied Statistics
MWF 8:30-9:25

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Office: RS228

Textbook: *Fundamentals and Applications of Statistics* , Randall Pruim
Other Materials: R and RStudio.

Course Description
This course is a continuation of MTH 3083 including the topics of random sampling and experimental design, sampling distributions, methods of estimation and the properties of estimators, least square estimates of parameter, linear regression, hypothesis testing, and confidence intervals, testing of models, data analysis and appropriateness of models. Topics are supported by the use of statistical software.

Prerequisites: MTH3083

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 collaborate effectively in teams.
- Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats.

Examinations
There will be two midterm exams and a final exam on **Wednesday Dec 2, 2020 7:30-10:00 am.** Make-up exams will be given only by arrangement prior to the exam scheduled date with the instructor for reasons of documented emergency. 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. I do not intend to accept excuses such as poor communication with parents, benefactors, sport team sponsors and/or travel agents.

Projects
There will be 3 projects throughout this course allowing you to apply the theory to a real dataset. You will be responsible for writing a statistical report for each.

Homework
Homework will be assigned weekly and is due Wednesday the week following class discussion.

Labs
Labs will be assigned on a regular basis. You may work on labs with others, but your final submission should be your own. It is possible that your code may look similar to those you work with, but it should be clear that the final product is your own.

Participation
Participation in weekly Zooms is expected, if you cannot make it you will need to watch the recorded video and post notes on what was discussed.

Grading Policies

Two midterm exams (15 % each)	20%
Final Exam	27.5%
Projects	15%
Homework	20%
Labs	15%
Participation	2.5%
Total	100%

Using the weightings above overall course grades will be computed using the approximate scale below. In order to receive a passing grade you must pass at least one midterm or final exam with a grade of 60% or higher.

Grading Scale in Percentages					
	A	**B**	**C**	**D**	**F**
+		[87.5, 90)	[77.5, 80)	[67.5, 70)	
	[92.5, 100]	[82.5, 87.5)	[72.5, 77.5)	[62.5, 67.5)	[0,60)
–	[90, 92.5)	[80, 82.5)	[70, 72.5)	[60, 62.5)	

Late work. A written assignment or computer assignment is late if it is not received at the beginning of class on the due date. Late work will not be accepted. Make-up tests will be given only by arrangement with the instructor for reasons of documented emergency.

Attendance Policy
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. Here is the university's stated policy on attendance:

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. See https://catalog.pointloma.edu/content.php?catoid=35&navoid=2136#Class_Attendance in the Undergraduate Academic Catalog.

If you miss 10% of the class, you will receive a warning. If you miss 20% of the class, you will be automatically de-enrolled.

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:
While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

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 https://catalog.pointloma.edu/content.php?catoid=35&navoid=2136#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

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.

Credit Hour
In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 16 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Component	Total Hours
Exams and Review	6
Final and Review	4
Reading (11 at 2 hours each)	22
Labs (13 at 1 hr. each)	22
Homework (11 at 3 hours each)	33
Lecture Zooms (24 at 1 each)	24
Projects (2 at 2.5 and 1 and 10)	15
Total	**126**

Point Loma Nazarene 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.

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.

Final Exam: Wednesday Dec 2, 2020 7:30-1:00 am
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.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8/16/20	8/17/20	8/18/20	8/19/20	8/20/20	8/21/20	8/22/20
	Zoom 4.1		Zoom 4.11		Lab	
8/23/20	8/24/20	8/25/20	8/26/20	8/27/20	8/28/20	8/29/20
	Zoom 5.1		Zoom 5.2 HW 1 Due		Lab	
8/30/20	8/31/20	9/1/20	9/2/20	9/3/20	9/4/20	9/5/20
	Zoom 5.3		Zoom 5.4 HW 2 Due		Lab	
9/6/20	9/7/20	9/8/20	9/9/20	9/10/20	9/11/20	9/12/20
	Zoom 5.5		Zoom 5.6 HW 3 Due		Lab	
9/13/20	9/14/20	9/15/20	9/16/20	9/17/20	9/18/20	9/19/20
	Zoom Review		Exam 1 HW 4 Due		Project	
9/20/20	9/21/20	9/22/20	9/23/20	9/24/20	9/25/20	9/26/20
	Zoom 5.7		Zoom 5.8		Lab	
9/27/20	9/28/20	9/29/20	9/30/20	10/1/20	10/2/20	10/3/20
	Zoom 5.9		Zoom 6.1 & 6.2 HW 5 Due		Lab	
10/4/20	10/5/20	10/6/20	10/7/20	10/8/20	10/9/20	10/10/20
	Zoom 6.3		Zoom 6.4 & 6.5 HW 6 Due		Lab	
10/11/20	10/12/20	10/13/20	10/14/20	10/15/20	10/16/20	10/17/20
	Zoom 6.6		Zoom 6.7 HW 7 Due		Lab	
10/18/20	10/19/20	10/20/20	10/21/20	10/22/20	10/23/20	10/24/20
	Zoom Review		Exam 2 HW 8 Due		Project	
10/25/20	10/26/20	10/27/20	10/28/20	10/29/20	10/30/20	10/31/20
	Zoom 6.8		Zoom 6.9		Lab	
11/1/20	11/2/20	11/3/20	11/4/20	11/5/20	11/6/20	11/7/20
	Zoom 7.1 & 7.2		Zoom 7.3 HW 9 Due		Lab	
11/8/20	11/9/20	11/10/20	11/11/20	11/12/20	11/13/20	11/14/20
	Zoom 7.5 & 7.6		Zoom Experimental Design HW 10 Due		Lab	
11/15/20	11/16/20	11/17/20	11/18/20	11/19/20	11/20/20	11/21/20
	Project		Project HW 11 Due		Project	
11/22/20	11/23/20	11/24/20	11/25/20	11/26/20	11/27/20	11/28/20
	Zoom Review		Thanksgiving			
11/29/20	11/30/20	12/1/20	12/2/20	12/3/20	12/4/20	12/5/20
			Final 7:30-10:00			