Syllabus

1902 POINT LOMA NAZARENE UNIVERSITY	**Department of Mathematical, Information, and Computer Sciences** MTH3063 (3 Units) Calculus Based Statistics With R **(3 units)**
Spring 2023	

Meetings	Final Exam	**Instructor:**	**Email:**	**Phone:**	**Office Hours:**
MWF 8:30-9:25 **RS 395**	**7:30-10:00 am** **Monday May 1, 2023**	Greg Crow, Ph.D.	gcrow@pointloma.edu	619.849.2604	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

MTH 3063 (3 Units) Calculus Based Statistics With R

A first course in descriptive and inferential statistics for general students who have taken calculus. Topics include experimental design, sampling and sampling distributions, estimation and hypothesis testing. This course also provides a basic introduction to statistical analysis in the statistical software package R. Not applicable toward a major in Mathematics.

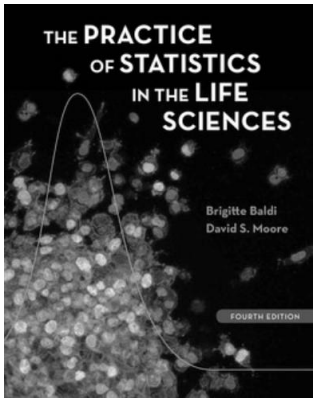
Prerequisite(s): MTH 1044 or MTH 1064 or equivalent.

COURSE LEARNING OUTCOMES

1. **Learning Outcomes**
2. Students will be able to compute measures of central tendency for data.
3. Students will be able to compute measures of dispersion for data.
4. Students will be able to use statistical methods to make inferences from data.
5. Students will be able to apply their technical knowledge to solve problems.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Baldi and Moore: *The Practice of Statistics in the Life Sciences,* 4th Edition



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 3 unit class delivered over fifteen 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

Category	Time Expectation in Hours
Reading Assignments (19 Ch. at 1.25 hours)	23.75
Weekly Class Participation	15
Lab Participation	8.5
Written Assignments (19 Ch. at 2.5 hours)	47.5
Lab Assignments (7 at 3 hours each)	21
Exams	2
Final Exam	2.5

Category	Time Expectation in Hours
Total Hours	116.5

ASSESSMENT AND GRADING

Graded Components

- **Weekly Classwork:** Attendance at the Monday and Wednesday in person class is required. In these class meetings, we will work on to work on activities and problems. Some classwork may be graded, and some you will get full credit just for attempting.
- **Written Homework -** The homework is designed to allow you to grasp the concepts of Statistics; it is not an end in itself. The homework problems will be taken from the Textbook and hand written on paper. There may also be other activities that are completed as homework. Each homework set will usually be due one week from when it is assigned. Please see the schedule below. Late homework will not be accepted without prior consent or a well-documented emergency beyond your control. Up to a maximum of one homework assignment will be accepted up to 3 days late provided that consent is received from the professor before it is due. Written homework that is submitted late without prior consent will be recorded with a score of zero. The lowest homework score will be dropped prior to computing the final course grade.

  In the event that our in person class is prohibited from meeting in person in a given week, please scan or photograph the pages, and upload the file to Canvas as a .pdf, .jpg, .jpeg, .png, or .docx (but not Google Docs). If you take a photograph with your phone, then please turn off the setting for *Live Photos* or *Motion Photo* prior to taking the picture. If you use Google Docs, please export to a .pdf and upload that file.

  Collected assignments must be prepared in a style suitable for grading. The following guidelines are used to determine credit:

  - the organization must be easy to follow
  - the work must be legible
  - complete solutions must be written for problems (not just answers);
  - answers must be clearly marked
  - use complete sentences to answer questions

- **Labs -** The labs will be posted in Canvas and are due in Canvas at the scheduled times (by 11:59 pm on Saturday). Up to a maximum of one Lab assignment will be accepted up to 3 days late provided that consent is received from the professor before it is

due. Lab assignments that are submitted late without prior consent will be recorded with a score of zero.

- **Examinations and the 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.

Grading Distribution	Percent
Weekly Participation	5
Written Homework	15
Labs	10
Exams (2 at 17.5% each)	35
Lab Final Exam	5
Final Exam	30
Total	100

Grading Scale

Grades are based on the number of points accumulated throughout the course with the following exception. A student must pass at least one of Examination 1, Examination 2, or the Final Examination in order to pass the class. That is, a score of 60% must be achieved on one of Examination 1, Examination 2, or the Final Exam or else the final grade will be an F regardless of all other point totals. Approximate minimal percentages required to obtain a given grade are

Standard Grade Scale Based on Percentages					
	A	**B**	**C**	**D**	**F**
+		[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)	[0.0-60.0)
–	[90.0-92.5)	[80.0-82.5)	[70.0-72.5)	[60.0-62.5)	

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.

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.

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 (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** 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 (https://mail.google.com/mail/?view=cm&fs=1&tf=1&to=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

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. See **Academic Policies (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** for further information about class attendance.

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 (https://www.pointloma.edu/offices/spiritual-development)**

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

FINAL EXAM - Monday May 1, 2023 from 7:30 am -10:00 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.

Spring 2023 MTH3063 Calendar

	Sun	Monday	Tues	Wednesday	Thu	Friday	Saturday
January	8 WK 1	9 On Tuesday 10th (Monday Schedule) Introduction Overview of Hybrid Course	10	11 Install both *R* and *RStudio* *Lab 1*	12	13 Open Lab	14 Read 1: Picturing Distributions with Graphs 2: Describing Distr. with Numbers
	15 WK 2	16 **Martin Luther King Jr. Day**	17	18 Activities 1: Picturing Distributions with Graphs 2: Describing Distr. with Numbers Homework 1 and 2	19	20 Open Lab	21 Read 3: Scatterplots & Correlation 4: Regression Analysis 5: Two-Way Tables Due: *Lab 1*
	22 WK 3	23 Activities 3: Scatterplots & Correlation 4: Regression 5: Two-Way Tables Homework 3, 4, and 5	24	25 Lab 2 HW Due 1 and 2	26	27 Open Lab	28 Read 6: Samples & Observational Studies 7: Designing Experiments
	29 WK 4	30 **Spiritual Renewal Week** Activities 6: Samples & Observational Studies 7: Designing Experiments Homework 6 and 7	31	1 **Spiritual Renewal Week** Open *R* Lab HW Due 3, 4, and 5	2	3 Open Lab	4 Read 9: Essential Probability 10: Independence & Conditional Prob. 11: Normal Distributions Due: *Lab 2*
February	5 WK 5	6 Activities 9: Essential Probability 10: Independence & Conditional Prob. 11: Normal Distributions Homework 9, 10, and 11	7	8 Lab 3 HW Due 6 and 7	9	10 Open Lab	11 Read 13: Sampling Distributions
	12 WK 6	13 Activities 13: Sampling Distributions Homework 13	14	15 Open *R* Lab HW Due 9, 10, and 11	16	17 Open Lab	18 Read 14: Introduction to Inference Due: *Lab 3*
	19 WK 7	20 Activities 14: Introduction to Inference Homework 14	21	22 Lab 4 HW Due 13	23	24 Open Lab	25 **Review for the Exam**
	26 WK 8	27 **Review for the Exam**	28	1 **Exam 1** HW Due 14	2	3 Open Lab	4 Read 15: Inference in Practice 17: Inference about a Pop. Mean

	Sun	Monday	Tues	Wednesday	Thu	Friday	Saturday
March	5	6 **Spring**	7	8 **Break**	9	10 **Week**	11
	12 WK 9	25 Activities 15: Inference in Practice 17: Inference about a Pop. Mean Homework 15 and 17	14	15 **Exam 1 Returned** Open *R* Lab	16	17 Open Lab	18 Read 18: Comparing Two Means 24: One-Way Analysis of Var. Due: *Lab 4*
	19 WK 10	20 Activities 18: Comparing Two Means 24: One-Way Analysis of Var. Homework 18 and 24	21	22 Lab 5 HW Due 15 and 17	23	24 Last Drops Open Lab	25 Read 19: Inference Pop. Proportion
	26 WK 11	27 Activities 19: Inference about a Pop. Proportion Homework 19	28	29 Open *R* Lab HW Due 18 and 24	30	31 **Exam Review** Open Lab	1 Read 20: Comparing Two Proportions Due: *Lab 5*
April	2 WK 12	3 Activities 20: Comparing Two Proportions Homework 20	4	5 **Exam 2** HW Due 19	6 Easter	7 Recess	8
	9 **Easter** WK 13	10 Easter Recess	11	12 Lab 6	13	14 Open Lab	15 Read 22: Chi-Square Test (χ^2)
	16 WK 14	17 Activities 22: Chi-Square Test (χ^2) Homework 22	18	19 **Exam 2 Returned** Lab 7 HW Due 20	20	21 Open Lab	22 Due: Lab 6
	23 WK 15	24 Open *R* Lab	25	26 **Lab Final Exam** HW Due 22	27	28 ** **Review for Final Exam**	29 *** **Review for the Final Exam** Due: Lab 7
May	30 WK 16	1 **Final Exam** **7:30 – 10:00 AM**	2	3	4	5	6

** No Written homework accepted after 4:00 pm on 28-May-2023

*** No Labs accepted after 11:59 pm on 28-May-2023