Syllabus

To-Do Date: Oct 27 at 11:59pm

1902 POINT LOMA NAZARENE UNIVERSITY	**Department of Mathematical, Information, and Computer Sciences** MTH3063 (3 Units) Calculus Based Statistics With R **(3 units)**
Fall 2020 August 17th - December 5th	

Instructor: Dr. Greg Crow, Ph.D.
Phone: 619.849.2604
Email: gcrow@pointloma.edu
Office hours: By Appointment in Zoom **(See Course and Office Hours Fall 2020.pdf (https://canvas.pointloma.edu/courses/52031/files/3515713/download?wrap=1) (https://canvas.pointloma.edu/courses/52031/files/3515713/download?wrap=1))**

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.

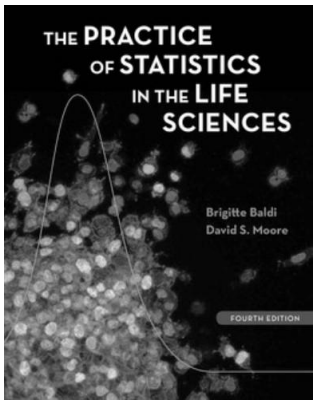
Prerequisite(s): **MTH 144** **(http://catalog.pointloma.edu/content.php?filter%5B27%5D=MTH&filter%5B29%5D=363&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=24&expand=&navoid=1590&search_database=Filter#tt1159)** or **MTH 164** **(http://catalog.pointloma.edu/content.php?filter%5B27%5D=MTH&filter%5B29%5D=363&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=24&expand=&navoid=1590&search_database=Filter#tt237)** 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 with Sapling Plus



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	23.75
Videos and Notes	15
Online Homework	19
Online Participation (Zoom)	15
Written Assignments	23.75
Online Lab Participation (Zoom)	15
Exam	2.5
Final Exam	2.5
Total Hours	116.5

ASSESSMENT AND GRADING

Graded Components

- **Video Notes** - Each section will have videos to watch and you should take notes. Your notes will be submitted in Canvas to provide evidence you are keeping up. Up to a maximum of one set of video notes will be accepted up to 3 days late provided that consent is received from the professor before it is due. Video notes that are submitted late without prior consent will be recorded with a score of zero. If you submit plausible notes for 90% or more of the assignments, you will receive full credit. If you submit plausible notes for 80% to 90%, you will receive half credit. If more than 20% of your video notes are either not present or not plausible, then you will receive no credit for video notes. Your video notes are due at 11:59 pm on Tuesday evening.
- **Online Homework -** This homework is designed to give you preliminary experience with the statistical concepts prior to the start of the lecture on the material. This will help you come to class better prepared, and with questions on the material. It will aid your instructor in identifying difficult concepts and addressing those topics in class. Up to a maximum of one week of online

homework will be accepted up to 3 days late provided that consent is received from the professor before it is due. Online homework that is submitted late without prior consent will be recorded with a score of zero. You have two attempts on each homework problem, you will want to perform one attempt prior to the start of class on the material. Following the class activity on the material, the final attempt is due on Saturday at 11:59 pm. **You must have access to SAPLING PLUS for this material (through the online access key).**

- **Weekly Zooms (Participation)** - Each week there is a scheduled Zoom to do activities and work on problems. It is understood that in some cases you will not be able to attend, in such cases, please request permission to attend the other zoom session that week. Where that is not possible, please watch the recorded video of the session and submit at least one problem discussed during the Zoom in the Canvas discussion to have your attendance counted. If you participate in 90% or more of the Zoom meetings, you will receive full credit. If you participate in 80% to 90% of the Zoom meetings, you will receive half credit. If do not participate in more than 20% of the Zoom meetings, then you will receive no participation credit.

- **Written Homework -** The homework is designed to allow you to grasp the concepts of Statistics; it is not an end in itself. Assignments will be announced on Monday and Wednesday. The work will be due on the following Tuesday. Please scan or photograph the pages, and upload the file to Canvas as a .pdf, .png, or .docx (but **not Google Docs**). If you use Google Docs, please export to a .pdf and upload that file. There may also be other activities that are completed as homework. 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. If more than half of the homework assignments are submitted on time, then the lowest homework score will be dropped prior to computing the final course grade.

  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).

- **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. The Lab Final Examination will be included as 1/5th of the Final Examination score.

Grading Distribution	**Percent**
Videos and Notes	2.5
Zoom Participation	2.5
Online Homework	10
Written Homework	10
Labs	15
Exams (2 at 15% each)	30
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 Exam 1, Exam 2, or the Final Exam in order to pass the class. That is, a score of 60% must be achieved on one of the Exams, 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

Standard Grade Scale Based on 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	

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.

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 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

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 (mailto: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.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Students taking online courses are expected to attend each week of the course. Attendance is defined as participating in an academic activity within the online classroom which includes posting in a graded activity in the course. (Note: Logging into the course does not qualify as participation and will not be counted as meeting the attendance requirement.)

Students who do not attend at least once in any 3 consecutive days will be issued an attendance warning. Students who do not attend at least once in any 7 consecutive days will be dropped from the course retroactive to the last date of recorded 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)**

Fall 2020

MTH3063 Calendar

	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
August	16	17 *on Zoom* Introduction Overview of Online Course (Video) Buy Online Text (including resources: Sapling) Install Both *R* and *RStudio* Lab 1 (Assigned) Reading & Videos 1: Picturing Distributions 2: Describing Distributions with Numbers Online HW 1 and 2 (1st Try)	18	19 *on Zoom* Activities 1: Picturing Distributions 2: Describing Distributions with Numbers HW Assigned 1 and 2 (Written)	20	21 *on Zoom* Activities 1: Picturing Distributions 2: Describing Dist. with Numbers HW Assigned 1 and 2	22 Reading & Videos 3: Scatterplots & Correlation 4: Regression Analysis 5: Two-way Tables Online HW 3, 4 and 5 (1st Try) **Due:** **Online HW** 1 and 2 (2nd try) **Video Notes** 1 and 2
	23	24 *on Zoom* Activities 3: Scatterplots & Correlation 4: Regression 5: Two-Way Tables HW Assigned 3, 4, and 5 (Written)	25 **HW Due** V 3, 4, & 5 W 1 & 2	26 *on Zoom* Activities 3: Scatterplots & Correlation 4: Regression 5: Two-Way Tables HW Assigned 3, 4, and 5 (Written)	27	28 *on Zoom* *Open Lab*	29 Reading & Videos 6: Samples and Observational Studies 7: Experiments Online HW 6 and 7 (1st Try) **Due:** **Online HW** 3, 4 and 5 (2nd try) ***Lab*** *1*
	30	31 *on Zoom* Activities 6: Samples and Observational Studies 7: Experiments HW Assigned 6 and 7 (Written)	1 **HW Due** V 6 & 7 W 3, 4, & 5	2 *on Zoom* Activities 6: Samples and Observational Studies 7: Experiments HW Assigned 6 and 7 (Written)	3	4 *on Zoom* *Lab 2*	5 Reading & Videos 9: Essential Probability 10: Independence & Conditional Prob. 11: Normal Distributions Online HW 9, 10 and 11 (1st Try) **Due:** **Online HW** 6 and 7 (2nd try)
September	6	7 *on Zoom* Activities 9: Essential Probability 10: Independence & Conditional Prob. 11: Normal Distributions **Review for Exam I** HW Assigned 9, 10, and 11 (Written)	8 **HW Due** V 9, 10, & 11 W 6 & 7	9 *on Zoom* Activities 9: Essential Probability 10: Independence & Conditional Prob. 11: Normal Distributions **Review for Exam I** HW Assigned 9, 10, and 11 (Written)	10	11 *on Zoom* *Open Lab*	12 **Due:** **Online HW** 9, 10 and 11 (2nd try)
	13	14 **Exam I**	15 **HW Due** W 9, 10, & 11	16 **Exam I**	17	18 *on Zoom* *Lab 3*	19 Reading & Videos 13: Sampling Distributions Online HW 13: (1st Try) **Due:** ***Lab*** *2*
	20	21 *on Zoom* Activities 13: Sampling Distributions **Exams Returned** HW Assigned 13 (Written)	22 **HW Due** V 13	23 *on Zoom* Activities 13: Sampling Distributions **Exams Returned** HW Assigned 13 (Written)	24	25 *on Zoom* *Open Lab*	26 Reading & Videos 14: Introduction to Inference Online HW 14 (1st Try) **Due:** **Online HW** 13 (2nd try)
	27	28 *on Zoom* Activities 14: Introduction to Inference HW Assigned 14 (Written)	29 **HW Due** V 14 W 13	30 *on Zoom* Activities 14: Introduction to Inference HW Assigned 14 (Written)	1	2 *on Zoom* *Lab 4*	3 Reading & Videos 15: Inference In Practice Online HW 15 (1st Try) **Due:** **Online HW** 14 (2nd try) ***Lab*** *3*

Fall 2020 — MTH3063 Calendar

October	4	5 *on Zoom* Activities 15: Inference In Practice HW Assigned 15 (Written)	6 **HW Due** V 15 W 14	7 *on Zoom* Activities 15: Inference In Practice HW Assigned 15 (Written)	8	9 *on Zoom* *Open Lab*	10 Reading & Videos 17: Inference about a Population Mean Online HW 17 (1st Try) **Due:** **Online HW** 15 (2nd try)
	11	12 *on Zoom* Activities 17: Inference about a Population Mean **Review for Exam II** HW Assigned 17 (Written) **HW Due** 15 (Written) **Spiritual**	13 **HW Due** V 17 W 15	14 *on Zoom* Activities 17: Inference about a Population Mean **Review for Exam II** HW Assigned 17 (Written) **HW Due** 15 (Written) **Renewal**	15 ———	16 *on Zoom* *Lab 5* **Week**	17 **Due:** **Online HW** 17 (2nd try) ***Lab*** *4*
	18	19 **Exam II**	20 **HW Due** W 17	21 **Exam II**	22	23 *on Zoom* *Open Lab*	24 Reading & Videos 18: Comparing Two Means 24: ANOVA Online HW 18 and 24 (1st Try)
	25	26 *on Zoom* Activities 18: Comparing Two Means 24: ANOVA **Exams Returned** HW Assigned 18 and 24 (Written)	27 **HW Due** V 18 & 24	28 *on Zoom* Activities 18: Comparing Two Means 24: ANOVA **Exams Returned** HW Assigned 18 and 24 (Written)	29	30 *on Zoom* *Lab 6*	31 Reading & Videos 19: Inference About a Proportion 20: Comparing Two Proportions Online HW 19 and 20 (1st Try) **Due:** **Online HW** 18 and 24 (2nd Try) ***Lab*** *5*
November	1	2 *on Zoom* Activities 19: Inference About a Proportion 20: Comparing Two Proportions HW Assigned 19 and 20 (Written)	3 **HW Due** V 19 & 20 W 18 & 24	4 *on Zoom* Activities 19: Inference About a Proportion 20: Comparing Two Proportions HW Assigned 19 and 20 (Written)	5	6 *on Zoom* *Open Lab*	7 Reading & Videos 22: Chi-Square Test (χ^2) Online HW 22 (1st Try) **Due:** **Online HW** 19 and 20 (2nd try) ***Lab*** *6*
	8	9 *on Zoom* Activities 22: Chi-Square Test (χ^2) HW Assigned 22 (Written)	10 **HW Due** V 22 W 19 & 20	11 *on Zoom* Activities 22: Chi-Square Test (χ^2) HW Assigned 22 (Written)	12	13 *on Zoom* **Lab Final Review** *Lab 7*	14 **Due:** Online HW 22 (2nd Try)
	15	16 **Lab Final Exam**	17 **HW Due** W 22	18 **Lab Final Exam**	19	20 *on Zoom* *Open Lab*	21 **Due:** ***Lab*** *7*
	22	23 *on Zoom* **Final Exam Review** Entire Class in One Session (Mon + Wed)	24	25 Thanksgiving Recess	26	27	28
	29	30 Final	1 Exam	2 Week	3 ———	4 **Final Exam** **10:30-1:00**	5