



Point Loma Nazarene University, Spring 2025

## Introduction to Statistics

Department of Mathematical, Information, and Computer Science – School of STEM

|                                                                                      |                         |                                      |                               |                 |
|--------------------------------------------------------------------------------------|-------------------------|--------------------------------------|-------------------------------|-----------------|
| <b>Instructor:</b> Kyle Havens                                                       |                         | <b>Course:</b> Math 2003             | <b>Section:</b> 1 & 2         | <b>Units:</b> 3 |
| <b>Office:</b> RS 210                                                                | <b>☎</b> (619) 849-2200 | <b>Days:</b> Monday and Wednesday    | <b>Section 1:</b> 2:30-3:45pm |                 |
| <b>Email:</b> <a href="mailto:kylehavens@pointloma.edu">kylehavens@pointloma.edu</a> |                         | <b>Location:</b> Liberty Station 201 | <b>Section 2:</b> 4:00-5:15pm |                 |

**PLNU Mission – Teach, Shape, 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:** A first course in statistics for the general student. Description of sample data, probability theory, theoretical frequency distributions, sampling, estimation, and hypothesis testing. Not applicable toward a major in mathematics.

### Required Materials:

1. Achieve Access Code – *The Basic Practices of Statistics*, 9<sup>th</sup> Edition by Moore et al. (ISBN: 9781319344634)
  - Physical Textbook is Optional – *The Basic Practices of Statistics*, 9<sup>th</sup> Edition (ISBN: 9781319244378)
2. Access to a computer and internet suitable to use the statistical software:
  - Microsoft Excel – Can be downloaded for free using your PLNU account, see Canvas.
3. Graphing Calculator (TI-84+ recommended)

**Office Hours:** Located in Rohr Science 210. Professor Havens has open office hours at the following times:

• Mondays: 10:00-11:55am • Tuesdays & Thursdays: 12:30-2:30pm • Wednesdays & Fridays: 10:55-11:55am.

### Student Learning Outcomes:

1. Students will be able to apply their technical knowledge to solve problems.
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 test hypotheses.
5. 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.

**Class Performance:** Your final grade in this course is calculated by the following system. Details on next page.

|     |                  |                                                             |
|-----|------------------|-------------------------------------------------------------|
| 30% | Final Exam       | Cumulative. You must get a “D” on the final exam to pass.   |
| 35% | Exam Average     | The average score of your two in-class exams                |
| 10% | Lab Assignments  | Average score of your nine labs with application questions. |
| 5%  | Lab Final        | A short in-person lab final on Microsoft Excel.             |
| 10% | Written Homework | Traditional written homework from the textbook.             |
| 10% | Class Activities | Based on completion of group activities and attendance.     |

**Good Attendance:** A student with no more than one unexcused absence is defined to have “good attendance.”

**Letter Grade:** The letter grade you receive in this course is based on the final percentage score you earned in the previously described weighted grading system. Requests for an opportunity to improve your grade due to personal circumstances will be denied. Borderline grades may be rounded up if student has good attendance.

|               |               |               |
|---------------|---------------|---------------|
| [92%,100%]: A | [82%,88%): B  | [70%,78%): C  |
| [90%,92%): A- | [80%,82%): B- | [68%,70%): C- |
| [88%,90%): B+ | [78%,80%): C+ | [60%,68%): D  |

**Final Exam:** The final exam is cumulative and will be held at the following time in the liberty station conference room:

**Monday, May 5<sup>th</sup> from 7:30am to 10:00am**

**Final Exam:** Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the [Traditional Undergraduate Records: Final Exam Schedules](#) site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

**Exams:** There will be two midterm exams during the semester covering roughly six weeks of content each. See the course schedule for more information. One 8.5"x11" page of notes will be allowed on each exam. Calculators are allowed on the exam. Contact me **before** missing an exam if you have a critical emergency. No make-up exams are allowed without prior consent. If you do not inform me that you will be missing an exam beforehand, you will get a zero on that exam. Exams are weighted equally at 17.5% of your total grade. If you have good attendance, I will adjust the weighted scale of the exams in your favor, 22.5% for the highest exam and 12.5% for the lowest. Practice questions will be posted on Canvas in advance of the exam designed to help you identify topics that you need to study further.

**Lab Assignments:** Each lab assignment is a write up that outlines your completion of the lab. Please submit your lab write up using either a PDF or Microsoft Word (DOCX) file. You may not submit an Microsoft Excel booklet (XLSX) file as your lab submission. Each lab has a guided section and an application section. You must first complete the guided section and provide ample proof that you completed the guided portion by providing screenshots or Excel code when prompted. The labs are **individual assignments**. Collaboration between students is encouraged but copying the lab reports of others is not tolerated. Even if you work together, you should be using your own words, your own spreadsheet, and your own screenshots. If you submit the same workbook or have the same write-up as another student you will get a zero and will face repercussions with academic affairs. Up to one lab assignment will be accepted late with a 10% penalty. 30 minutes of class time is designated to help you get started on each lab assignment. Please bring your laptop to class on those days.

**Lab Final:** The lab final will occur the last week of class and will be a short test of your Excel comprehension. You are required to bring your laptop to class on that day.

**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 or tablet. The written homework will then be submitted to Canvas in the appropriate module. Written homework must be neat, orderly, and legible. It is your responsibility to check for any issues with the Canvas submission, as your assignment will be treated as missing if the virtual submission cannot be viewed. Homework is scored on a combination of completeness and correctness. A random selection (the same for each student) of problems will be graded on each homework assignment. I encourage you to help one another with homework, but directly copying an online source or another student's homework assignment is considered plagiarism and will not be tolerated. A maximum of two written homework assignments can be turned in late subject to a 10% penalty as long as they are submitted before the corresponding exam.

**Class Activities:** Mathematics requires active participation. Participation means asking questions, taking notes, making conjectures and checking them, providing solutions to problems, and sharing ideas with classmates. I will act as the expert facilitator during class time, with a mixture of lecture, group problem solving, use of technology, and integrated discussion. You will receive activity credit for your attendance by using the sign-in sheet. Each class we will work on a class activity directly related to the chapters of study. You are to work on them in your groups and submit them to Canvas by the last day of lecture on the subject. These may be fully graded or you may get credit for completion, depending on the activity.

**Achieve:** Achieve by Macmillan allows you to access the textbook, statistical applets, and other publisher resources.

**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 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 115 estimated total hours meeting the course learning outcomes.

**Artificial Intelligence Policy:** You are allowed to use Artificial Intelligence (AI) tools (e.g. ChatGPT, Gemini Pro 1.5, GrammarlyGo, Perplexity, etc.) to generate ideas, but you are **not allowed** to use AI tools to generate content (math, text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

**PLNU Academic Accommodations Policy:** PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center ([EAC@pointloma.edu](mailto:EAC@pointloma.edu) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines allowed accommodations. The EAC makes accommodations available to professors at the student's request. 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. Accommodations are not retroactive so clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes. 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. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any special accommodations.

**Sources of Help:** If you find yourself struggling, consider asking for help using any of the following:

1. Your Professor. If you have questions, email me, ask in class, or come to my office hours.
2. Other classmates. Form study groups and work together both in and out of class.
3. Tutoring. Available in Rohr Science through the Tutoring Center whose hours will be posted on Canvas.
4. Online resources. Accessible on Canvas, or find them yourself via YouTube, Khan Academy, etc.
5. Practice exam questions. Look at them ahead of time and use them to assess your understanding.

**Additional Course Information:** Additional PLNU policies and practices that apply to this course can be found at the link below. The link includes PLNU's statement on spiritual care, state authorization, copyright policy, recording notification, academic honesty policy, language and belonging, sexual misconduct and discrimination, attendance and participation policy, course modality definitions, LomaBooks, use of technology, and the Loma Writing Center.

<https://docs.google.com/document/d/18i1pUoY0iCfB8w7JKxVvACQW309X-JRB/edit?usp=sharing&ouid=116164865489739533893&rtpof=true&sd=true>

**Course Schedule:** This course syllabus and schedule are subject to change due to unforeseen circumstances.

| <b>Week of</b> | <b>Monday</b>                                                                       | <b>Wednesday</b>                                                                           | <b>Due Soon</b>                                      | ✓ |
|----------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------|---|
| 1/13/2025      | <b>Course Introduction &amp; Ch.1:</b><br>Picturing Distributions                   | <b>Ch.1-2:</b> Describing Distributions<br><i>Work on Class Activity Ch.1-2</i>            | Class Survey, Obtain<br>Materials, Intro Quiz        |   |
| 1/20/2025      | <i>No Class</i><br><i>MLKJ Day</i>                                                  | <b>Lab 1 &amp; Ch.2:</b> Numerical Stats<br><i>Begin Lab #1, Finish CA Ch.1-2</i>          | Class Activity Ch.1-2<br>Lab #1                      |   |
| 1/27/2025      | <b>Lab 2 &amp; Ch.4:</b> Scatterplots<br><i>Begin Lab #2, Begin CA Ch.4-6</i>       | <b>Ch.4-5:</b> Correlation<br><i>Work on Class Activity Ch.4-6</i>                         | Written Homework Ch.1-2<br>Lab #2                    |   |
| 2/3/2025       | <b>Ch.5-6:</b> Linear Regression<br><i>Work on Class Activity Ch.4-6</i>            | <b>Lab 3 &amp; Ch.6:</b> Two-Way Tables<br><i>Begin Lab #3, Finish CA Ch.4-6</i>           | Class Activity Ch.4-6<br>Written Homework Ch.4-5     |   |
| 2/10/2025      | <b>Class Data and Misuses of Stats</b><br><i>Finish CA Misuses of Statistics</i>    | <b>Ch.8-9:</b> Sampling and<br>Experiments<br><i>Finish Class Activity Ch.8-9</i>          | CA Misuses, CA Ch.8-9<br>Lab #3                      |   |
| 2/17/2025      | <b>Ch.3:</b> The Normal Distribution<br><i>Begin Class Activity Ch.3</i>            | <b>Ch.3:</b> The Normal Distriubtion<br><i>Finish Class Activity Ch.3</i>                  | Class Activity Ch.3<br>Written Homework Ch.6-9       |   |
| 2/24/2025      | <b>Exam #1</b>                                                                      | <b>Lab 4 &amp; Ch.15:</b> Intro to Inference<br><i>Begin Lab #4, Class Activity Ch.15</i>  | Written Homework Ch.3                                |   |
| 3/3/2025       | <b>Ch.15-16:</b> Central Limit Theorem<br><i>Finish CA.15, Begin CA Ch.16-17</i>    | <b>Lab 5 &amp; Ch.16:</b> Confidence<br>Intervals<br><i>Begin Lab #5, Work CA Ch.16-17</i> | Class Activity Ch.15<br>Lab #4                       |   |
| 3/10/2025      | <i>No Class</i><br><i>Spring Break</i>                                              |                                                                                            |                                                      |   |
| 3/17/2025      | <i>No Class</i><br><i>Professor Out of Town</i>                                     | <b>Ch.17:</b> Tests of Significance<br><i>Work on Class Activity Ch.16-17</i>              | Written Homework Ch.15-16<br>Lab #5                  |   |
| 3/24/2025      | <b>Lab 6 &amp; Ch.17:</b> Hypotheses Tests<br><i>Finish Class Activity Ch.16-17</i> | <b>Ch.18-20:</b> Inference in Practice<br><i>Begin Class Activity Ch.20</i>                | Class Activity Ch.16-17<br>Lab #6                    |   |
| 3/31/2025      | <b>Ch.20:</b> T-Distributions and Tests<br><i>Finish Class Activity Ch.20</i>       | <b>Lab 7 &amp; Ch.21:</b> Comparing<br>Means<br><i>Begin Lab #7, Begin CA.Ch21</i>         | Class Activity Ch.20<br>Written Homework Ch.17-18    |   |
| 4/7/2025       | <b>Exam #2</b>                                                                      | <b>Ch.21:</b> Two-Sample T-Inference<br><i>Finish Class Activity Ch.21</i>                 | Class Activity Ch.21<br>Lab #7                       |   |
| 4/14/2025      | <b>Ch.22:</b> Inference w/ Proportions<br><i>Begin Class Activity Ch.22-23</i>      | <b>Lab 8 &amp; Ch.23:</b> More Proportions<br><i>Begin Lab #8, Finish CA Ch.22-23</i>      | Class Activity Ch.22-23<br>Written Homework Ch.20-21 |   |
| 4/21/2025      | <i>No Class</i><br><i>Easter Break</i>                                              | <b>Ch.25-27:</b> ANOVA and Chi-<br>Square<br><i>Begin Class Activity Ch.25-27</i>          | CA Ch.22-23, Lab #8<br>Written Homework Ch.20-21     |   |
| 4/28/2025      | <b>Lab Final</b>                                                                    | <b>Lab 9 &amp; Ch.27:</b> Chi-Square<br><i>Finish CA.Ch25-27, Begin Lab #9</i>             | Class Activity Ch.25-27<br>Written Homework Ch.22-23 |   |
| 5/5/2025       | <b>Final Exam</b><br>7:30am-10:00am                                                 | <i>Finals Week</i>                                                                         | Written Homework Ch.25-27<br>Lab #9                  |   |