Stat 231: Introductory Statistics

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Work In Progress: This site is under construction for use.

Statistics are everywhere. The goal of this course is to give a broad overview of statistical methods and analysis including measures of central tendency and dispersion and generalizations about populations from samples by parametric and nonparametric techniques. Methods covered will include estimation, hypothesis testing, correlation analysis, regression, chi square, and ANOVA analysis. There is also a required computer lab which will introduce the statistical programming language R and how it can be used for analysis and data visualization.

Chapter 1

Course Info

Instructor: Nick Paterno

Email: paternnj@plu.edu

1.0.1 Office Hours

Sign up here

Day	Hours
Monday	8:00 am - 2:30 pm
Tuesday	1:00 pm - 3:00 pm
Thursday	1:00 pm - 3:00 pm

Campus: Morken 261

Virtual: via Zoom or Google Meet.

1.0.2 Class Schedule

Day	Activity
Monday	New video lessons posted/Discussion & Problems Session
Tuesday	Office Hours
Wednesday	Discussion & Problems Session
Thursday	Office Hours
Friday	Live Coding & Workshop

It is assumed that you will have done some reading and/or watched the video lessons **BEFORE** coming to class on Monday and Wednesday. Those classes will start with a brief discussion of the material and segue into a problem solving session.

For the Live Coding & Workshop sessions, we will start with a lesson on a specific element of statistical computing. This will be the live coding part;

you'll have your laptop closed and can watch the process of structuring a file, troubleshooting errors and anything else that can come up when writing code. The remainder of class will be spent in workshop mode, which allows you to begin the lab assignment as well as collaborate with your peers.

1.0.3 Class Materials

Textbook: OpenIntro Statistics, 4th Ed

1.0.3.1 Technology:

- Access to a word processing program.
- R and RStudio (These are free and we will get them setup during our first lab day)
- A graphing calculator, preferably a TI-83 or TI-84. A Casio FX-9750GII will also work (useful but *optional*).

1.1 Graded Items and Grading Guidelines

1.1.1 Weights of Grades:

Category	Weight
Quizzes	30%
Labs	25%
Paper	15%
Final	30%
Total	100%

1.1.1.1 Homework:

Homework will not be graded but quiz and final exam questions will be heavily based on problems assigned for homework. Solutions to even numbered problems are available upon request.

1.1.1.2 Quizzes:

There will be one in-class quiz for each chapter (seven total). Quiz questions will be a mix of computation and short answer, no multiple choice. Your lowest quiz score will be dropped.

1.1.1.3 Labs:

We will have weekly coding sessions and workshops with the exception of weeks seven and fourteen. Your lowest two labs (workshop assignments) will be dropped. Late lab submissions will be accepted within 24 hours of the due date with a 15% deduction and will not be accepted past the 24 hour mark.

1.1.1.4 Paper:

Each student will be required to write a paper about statistics in the media. Details will be given out in the second week of class via email and the Announcements page. The paper is due no later than the Last Day of Instruction (see Important Dates below). If there is a week where you don't have much work in your other classes or our class didn't take you long then you may want to knock out the paper early in the semester.

1.1.1.5 Final:

The final will have two parts: one in-class exam (similar to the quizzes) and a take-home lab to be completed as an RMarkdown file. The lab is due when you come in for the in-class final. Late lab submissions will be accepted within 24 hours of the due date with a 15% deduction and will not be accepted past the 24 hour mark.

1.1.2 Important Dates

Date	Event
4/2/2021	No Class: Good Friday
5/21/2021	Last Day of Instruction
5/24/2021-5/28/2021	Finals Week

Chapter 2

Announcements

All class announcements will be posted here and organized by module and date. There will be a mix of video and text announcements. You will be notified via email and text message (if you're signed up for REMIND) when a new announcement is posted.

2.1 Module One

Chapter 3

Readings & Resources

3.0.1 Textbook

Chapter 1: Sections 1.1 - 1.4

Chapter 2: Sections 2.1 - 2.2

Chapter 3: Sections 3.1 - 3.2, 3.4 - 3.5

Chapter 4: Sections 4.1, 4.3

Chapter 6: Sections 6.1 - 6.3

Chapter 7: Sections 7.1 - 7.3, 7.5

Chapter 8: Sections 8.1 - 8.4

3.0.2 Resources:

- R for Data Science: Data manipulation, visaulisation and modeling in R.
- ModernDive: Statistical Inference via R and the Tidyverse.

Chapter 4

Video Lessons

Disclaimer:

The videos below have the correct section written above the video with the length of the video in parenthesis. The video itself might refer to a different section number as the videos were created with a previous edition of the textbook.

4.1 Attribution

Videos were created by OpenIntro.

4.2 Chapter 1

Section 1.1 (4:29)

Section 1.2 (4:14)

Section 1.3 (3:10)

Section 1.3 (3:37)

Section 1.4 (3:10)

4.3 Chapter 2

Section 2.1 (3:11)

Section 2.2 (4:59)

4.4 Chapter 3

Chapter 3 Overview (7:19)

Section 3.1 (19:52)

Section 3.1 (8:24)

4.5 Chapter 4

Section 4.1 (20:17)

Section 4.3 (8:46)

4.6 Chapter 6

Sections 6.1 and 6.2 (16:16)

Section 6.3 (14:46)

4.7 Chapter 7

Section 7.1 (7:21)

Section 7.1 (9:45)

Section 7.2 (9:03)

Section 7.3 (8:57)

Section 7.5 Part I (9:34)

Section 7.5 Part II (2:58):

Section 7.5 Part III (6:49):

4.8 Chapter 8

Section 8.1 (4:05)

Section 8.2 (6:48)

Section 8.3 (2:52)

Section 8.4 (4:20)

Chapter 5

R Labs

Each week we will have a code along/live code session as well as a workshop. The topic for the code along/live code will be the same for the workshop. Throughout the semester, I will use the same data set for as many weeks as possible, that way you can see how the data analysis process works for an entire project as opposed to isolated problems. Below is a tentative schedule of topics.

Week	Topic
One	Getting Started with R
Two	RMarkdown Crash Course
Three	Data Viz I
Four	Descriptive Statistics I
Five	Data Wrangling I
Six	Data Wrangling II
Seven	NO LAB
Eight	Data Viz II
Nine	Descriptive Statistics II
Ten	Inferential Statistics I
Eleven	Inferential Statistics II
Twelve	Linear Modeling I
Thirteen	Linear Modeling II
Fourteen	NO LAB

Notes: - There will not be a code along/live coding session for week one. - Week two's code along/live code will be a preview of some things you'll learn throughout the semester. - There will be a screencasted version of the code along/live coding sessions posted on this page on Thursday evenings.

5.1 Week One: Getting Started with R

Chapter 6

Homework

6.0.1 Chapter 1

Section	Problems
1.1	1
1.2	3, 5, 9, 11
1.3	13-14, 17, 21-27 odd
1.4	29-33 odd, 37, 40, 43

6.0.2 Chapter 2

Section	Problems	Notes
2.1	1, 5-11 odd, 13-14, 17	Do the calculations for #9
2.2	21, 23	
2.3	25-33 odd	

6.0.3 Chapter 3

Section	Problems
3.1	1-11 odd
3.2	15, 17, 21-22
3.3	29-31, 33-35
3.4	37-43 odd

6.0.4 Chapter 4

Section	Problems
4.1	1-9 odd
4.3	17, 19, 23, 25

6.0.5 Chapter 6

Section	Problems
6.1	2-7 odd, 11, 15
6.2	17, 22, 24, 27, 29
6.3	31-34
6.4	35, 39-43 odd, 46, 50

6.0.6 Chapter 7

Section	Problems
7.1	1-7 odd, 10, 13
7.2	16-19, 21
7.3	23-31 odd
7.5	37-39, 41-45 odd

6.0.7 Chapter 8

Section	Problems
8.1	1-5 odd, 7-8, 11, 13-16
8.2	19-20, 23, 25
8.3	27-19
8.4	32-33, 36, 39-43 odd