



## SYLLABUS

### Statistics for research (Stat 401)

**Course:** 01:960:401:01 Spring 2022  
**Class Times:** MH 8:30-9:50 PM  
**Room:** CDL 102 C/D  
**TA:** TBD  
**TA OFFICE HOURS:**TBD

**Instructor:** Dr Michael LuValle  
**E-mail:** [ml1305@stat.rutgers.edu](mailto:ml1305@stat.rutgers.edu)  
**Office/Class:** <https://rutgers.webex.com/meet/ml1305>  
**Office:** 467 Hill Center (not yet, lets hope)  
**Office Hrs:** TBD

#### **Masks in the class room:**

In order to protect the health and well-being of all members of the University community, masks must be worn by all persons on campus when in the presence of others (within six feet) and in buildings in non-private enclosed settings (e.g., common workspaces, workstations, meeting rooms, classrooms, etc.). Masks must be worn during in person class meetings; any student not wearing a mask will be asked to leave.

**Class will be through the Webex room listed above (Office/Class) through Jan 30 as per the Rutgers administration. Hopefully seeing you in person from then on.**

#### **Course Description Catalogue**

01:960:401. Basic Statistics for Research (3)  
Prerequisite: 01:640:115 or equivalent. Credit not given for more than one of 01:960:201, 211, 285, and 401; nor for more than one of 01:960:212, 384, 401, and 484.  
As applied in fields other than statistics; treats research projects dependent on the use of observed data from planned experiments. Includes inference methods in estimation and hypothesis testing, and general linear models.

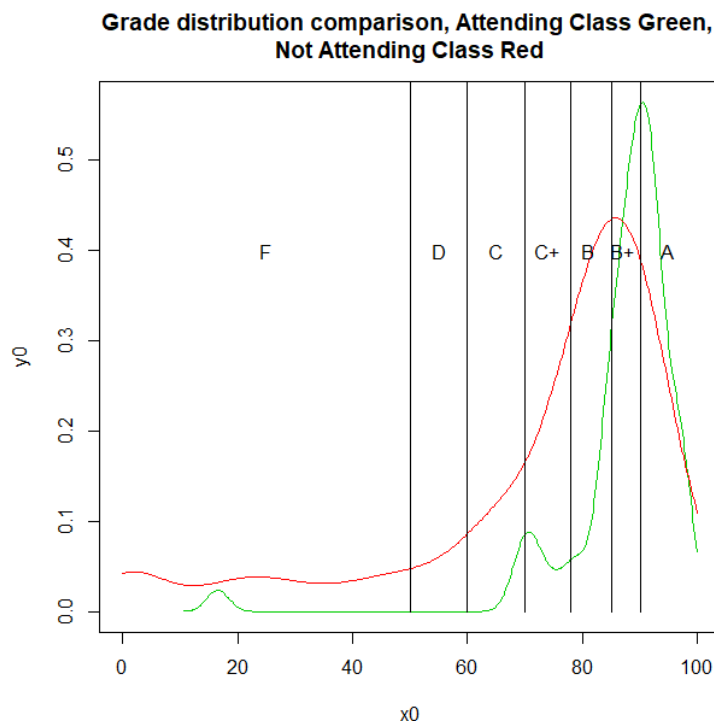
#### **Course Objective:**

The Purpose of this course is to acquaint you with statistical thinking and methods so you can apply it to research problems.

**How the course works:** While the lectures are based loosely on the book. Sometimes the book includes things not in the lecture, sometimes the lectures include things not in the book. The slides are provided at the start of each lecture, and there will be some prerecorded mini lectures describing particular ideas and methods you need. It is important to note that I cover things not in AP Stat, so attending class is helpful.

**How helpful is attending class:** I noticed last semester only about 1/3 of the students were actually showing up to class. I sampled a few days to see who was actually attending, then compared grades between those who attended and those who didn't. Since grading is entirely on

performance, there is not a subjective bias. Below is a graph showing the two distributions of grades. A is >90.



Note this is not a promise of results, simply an observation of how much attending class can help your grade based on 1 semester of observation. Possible confounders like homework participation not included.

**BOOK: Elementary Statistics** Mario F Triola

The subjects covered ambitiously include (we'll see how the class rolls!)

- 1) Probability
  - a) Chapter 4 Intro to probability
  - b) Chapter 5 Discrete distributions
  - c) Chapter 6 Normal and continuous distributions
- 2) Intro to Data
  - a) Chapter 1 Describing and Collecting Data
  - b) Chapter 2 Exploring Data
  - c) Chapter 3 Statistical Summaries
- 3) Inference 1: Basics
  - a) Chapter 7 Interval estimation, sample size calculation
  - b) Chapter 8 Hypothesis testing
  - c) Multiple testing issues
  - d) Chapter 9 Two sample tests
- 4) Inference 2: Correlation and association
  - a) Chapter 10: Regression
  - b) Chapter 11: Goodness of fit and Contingency Tables
- 5) Inference 3: Analysis of variance
  - a) Chapter 12: ANOVA: analysis of variance
- 6) Inference 4: Nonparametric Tests
  - a) Chapter 13 Nonparametric Tests

## Course Mechanics

For this course, we have a book, online content through Pearson and 1<sup>st</sup> Day (cheapest? Way to get book) apps and data sets through Pearson Stat lab and at [www.lock5stat.com/Statkey](http://www.lock5stat.com/Statkey) , slides, and my lectures. Some data sets will be available through canvas. Although my lectures will for the most part reinforce the book, in some places I will add things or discuss modifications of what the book is providing, and there will be parts of the book I deemphasize, so you need the information from lectures. Lectures in the class will take 2 forms, minilecture videos you can download from canvas and review, and in person lectures in the class room. Review the minilectures before hand so you can ask questions during the class.

Slides will be posted for each class, before or during the class, but you really don't want to miss the lectures. **Masks are mandatory in class, as is social distancing per Rutgers guidelines.**

## Class Site CANVAS

Rutgers Honor Pledge is in effect at all times: *"On my honor, I have neither received nor given any unauthorized assistance on this examination/assignment."*

## Grading:

**Homework: online self paced and some assigned from class as "extra credit"**

The online self paced homework requires Pearson Statlab, available through 1<sup>st</sup> day and is "extra credit"

Quizzes are cumulative, take home, handed in during class. Quizzes can be done in small groups.

There will be one midterm and one final exam. These exams are to be done by yourself.

You may ask me questions, and they are open book and open note.

Not counting extra credit Quizzes= 1/2 of grade, midterm =1/6 of grade, Final=1/3 of grade

There will be a final project as well again for "Extra credit"

**Grade will depend between 60 and 100% on the quizzes and tests, how much depends on how much extra credit you do.**

**Final score is  $100 \times \frac{\sum \text{Quiz and test scores} + \sum \text{extra credit scores}}{\sum \text{total possible quiz and test scores} + \sum \text{extra credit scores}}$**

**Take time to understand what this means.**

**Text: Elementary Statistics, Mario F. Triola (14<sup>th</sup> edition)**

## Main References:

| <u>Grade</u>   | <u>Final Score</u> |
|----------------|--------------------|
| A              | $\geq 90$          |
| B <sup>+</sup> | 85 - 89            |
| B              | 78 - 84            |
| C <sup>+</sup> | 70 - 77            |
| C              | 60 - 69            |
| D              | 50 - 59            |

**TEACHING ASSISTANT AND LEARNING CENTERS:**

If experiencing difficulty with any problems or need help with the course material, please ask for help, during class, by email or through office hours. If it is course material feel free to ask the TA as well (To be assigned).

**ON-LINE RESOURCES:**

The syllabus, and class-handouts are posted on Canvas.

1<sup>st</sup> day resources will be described by Pearson representatives in an early class

**USEFUL CONTACTS/LINKS:**

Counseling, ADAP & Psychiatric Services (CAPS): (848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / <http://rhscaps.rutgers.edu>

Violence Prevention & Victim Assistance (VPVA): (848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / <http://vpva.rutgers.edu>

Disability Services: (848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu>

Scarlet Listeners: (732) 247-5555 / <http://www.scarletlisteners.com>