# Statistics and the Weather 

(INQ-240-I); Fall 2018
Instructor:
Michael Pastor Office: Trexler 161-C
Email: pastor@roanoke.edu Office hours: Tues, 11:45-12:45 PM (email is the best
way to contact me)

## Class Meeting:

Tuesday and Thursday: 10:10-11:40 AM

## Office Hours:

Office: Trexler 161-C
Office hours: Tues, 11:45-12:45 PM

## Course Description:

This course provides an inquiry-focused introduction to statistical methodologies. Students will gain an understanding of how decision making is accomplished using modern statistical techniques. Topics include descriptive statistics, graphical methods, estimation, elementary probability, and statistical inference; students will apply the techniques of data analysis to data sets and statistical studies that address the course theme.

## Learning Outcomes:

By the end of this course, students will be able to,

- Use the methodologies of statistics to investigate a topic of interest and make decisions based on the results.
- Use the methodologies of statistics to design and carry out simple statistical experiments.
- Use the methodologies of statistics to critique news stories and journal articles that include statistical information. In the critique, students will recognize variability and its consequences, identify potential sources of bias, and both proper and improper cause and effect inference.
- Articulate the importance and limitations of using data and statistical methods in decision making.
- Write about course topics clearly and effectively.
- Interpret quantitative information related to the course topic.


## Class Materials:

- Class Text Book: Blumen, Elementary Statistics a Step by Step Approach (9th ed.).


ISBN-13: 978-0078136337

- ISBN-10: 0078136334
- Optional Reference Books: Hacker, A Writer's Reference, RC Edition
- Calculator: A basic scientific calculator. Learn to use it before test day. A calculator capable of performing basic statistic calculations would be beneficial.


## Course Grades:

The following table outlines the the approximate grade weights

| Exams | $60 \%$ |
| :--- | :--- |
| Homework | $20 \%$ |
| Project | $20 \%$ |

Letter grade Scale

| A | $93-100$ | C | $73-76$ |
| :--- | :--- | :--- | :--- |
| A- | $90-92$ | C- | $70-72$ |
| B+ | $87-89$ | D+ | $67-69$ |
| B | $83-86$ | D | $63-66$ |
| B- | $80-82$ | D- | $60-62$ |
| C+ | $77-79$ | F | $0-59$ |

## Homework Quizzes:

Graded homework will consist of electronic quizzes that can be taken online in your "Inquire" class management page [ inquire.roanoke.edu ]. The quizzes will be typically multiple choice and cover the material presented in class. The quizzes will be available after the material in class has been covered and typically due a week later. Don't wait until the last minute to submit your quizzes to help avoid computer or other issues.

## Exams:

There will be three exams during the semester and a final exam. During these exams no cell phone use will be permitted. You may use a basic scientific calculator and a $3 \times 5$ note card with notes (front and back). When you take the final exam, you can re-use all of these note cards plus one additional (essentially up to four note cards for the final). The final will include two sections. The first section covers the material learned in the last few days of class. The second section is a cumulative portion covering all material covered in the class.

Please Note, missing an exam will result in a score of zero for that exam. I do not allow make up exams during the semester. So, if you miss an exam you get a grade of zero. However, the grade you get on the cumulative final can be used to replace your lowest exam score.

## Projects:

There will be up to three projects in class that are designed to challenge your problem solving and data manipulation skills. These projects will be setup to allow you the freedom to be independently creative and explore the connection between weather and statistics.

## Reading:

It is expected that all students will read assigned sections prior to class and come prepared to participate and discuss the material. Consult the table at the end of this syllabus for more information. Additional readings may be announced in class.

## Attendence and Make-up Work:

Attendance and the completion of assignments on time is critical to your success in this class. Past experience has shown that students who miss class usually perform poorly on exams. It is your responsibility to complete all assignments on time and show up for the in class exams. I do not give make-up exams. However, I know things can happen and that is why I permit the grade that you receive on the cumulative portion of the final can be used to replace the lowest exam grade during the semester.

## Academic Integrity:

Students are expected to adhere to the Academic Integrity policies of Roanoke College. No electronic devices other than a calculator can be taken out during testing time (this includes cell phones). Please note, that looking at a cell phone during an exam is a violation of Academic Integrity regardless of your purpose. Further, you are not allowed to leave class during an exam until you have finish and turned in your work.

## Student Resources:

- Center for Learning and Teaching $\circ$ Subject Tutoring $\circ$ Writing Center
- Online at [ roanoke.edu/inside/clt ] ○
email: clt@roanoke.edu
- Student Support Services o email: sbrown@roanoke.edu


## Important Dates:

| Last day to add TR Class: | Monday, | Jan 22 by 4PM |
| :--- | :--- | :--- |
| Last day to drop before "W" | Friday, | Jan 26 |
| Spring Break | Monday, | Mar 5-Mar 9 |
| Withdraw deadline | Friday, | Mar 16 by 4PM |
| Last day of Class | Monday, | Apr 23 |
| Final Exam | Thursday, | Apr 26 (8:30-11:30AM) |

## Statement of Work Load:

A work load of at least 12 hours each week is expected inside and outside of class. I would further suggest you put in at least 6 hours of focused study prior to any exam.

## Course schedule:

The following is a tentative schedule subject to change.

| Part I |  |  |
| :---: | :---: | :---: |
| Jan 15, 18 | Chapter 1 | Introduction |
| Jan 24, 26 | Chapter 2 | Graphs and Distributions |
| Jan 30, Feb 1 | Chapter 10 | Correlation and Regression |
| Feb 6 | Exam 1 |  |
| Part II |  |  |
| Feb 8, 13 | Chapter 3 | Data Description |
| Feb 15, 20 | Chapter 6 | Normal Distribution |
| Feb 22, 27 | Chapter 4 | Probability |
| Mar 1, 13 | Chapter 5 | Discrete Distributions |
| Mar 15 | Exam 2 |  |
| Part III |  |  |
| Mar 20, 22 | Chapter 7 | Confidence Intervals |
| Mar 27, 29 | Chapter 8 | Hypothesis Testing |
| Apr 3, 5 | Chapter 9 | Testing Differences |
| Apr 10 | Exam 3 |  |
| Part IV |  |  |
| Apr 12, 16, 19 | Chapter 11, 12 Final | Chi-Squared and ANOVA |

