

**INQ 240 Statistical Reasoning-Here's to Your Health!  
Fall, 2016**

**Sections A1 and A2**

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**Office Hours:** M/W/F: 8:00-8:15 and 11:00-1:00. These hours are for both my INQ 240 students and my Math 111 students. Additional hours will be added as necessary. These will be announced in class and posted on INQUIRE.

**Note: Students who have completed Stat 202 may not take this course for credit. Students must receive a C or better in this course or Math 111 to declare a major in Business Administration. You may wish to discuss grade requirements with your advisor with regards to your major.**

**Course Description:** Students will gain an understanding of how decision making is accomplished using modern statistical techniques. Topics include descriptive statistics, graphical techniques, elementary probability, estimation, inferential statistics, linear correlation, and regression. Quantitative reasoning will also be emphasized.

**Specific Area of Inquiry:** Students will apply the techniques of data analysis to data sets and statistical studies that deal with **health** related issues.

Intended Learning Outcomes:

1. Students will be able to use the methodologies of statistics to
  - a. Investigate a topic of interest and make decisions based on the results.
  - b. Design and carry out a simple statistical experiment.
  - c. 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.
2. Students will be able to articulate the importance and limitations of using data and statistical methods in decision making.
3. Students will be able to write about course topics clearly and effectively.
4. Students will be able to interpret quantitative information related to the course topic.

Course Materials

Primary text: *Statistics in Practice-1<sup>st</sup> edition* by Moore, Notz, and Fligner.

Writing Handbook: *A Writer's Reference*, Diana Hacker, Roanoke College Edition

In addition, we will use: Various magazines and newspapers available in the Fintel Library

Minitab statistical software packages (available in college labs and by using virtual labs)

**Scientific/graphing calculator**

I expect you to keep notes, quizzes, tests, etc. in an organized notebook. Homework should be organized separately. It is your responsibility to get any notes missed when absent and to attempt any assignment that is given. **You must have notes before seeing me for assistance after any absence.**

**Academic Integrity:** You are expected to be familiar with the Academic Integrity Code as outlined in *Academic Integrity at Roanoke College*. I take this topic very seriously. Collaboration is only allowed on daily homework assignments or small group projects as specified. Otherwise, work shall be your own. Students will be required to pledge all work completed for a grade in this class.

**Classroom Policies:** Cell phones and pagers must be turned off prior to entering class. You are not to send or receive text messages during class!! The use of any electronic device during a quiz, test, or exam is strictly prohibited. Calculators may be used on quizzes, tests, exam, and homework as indicated by the professor. You will not share calculators during evaluations!

**Attendance Policy:** Attendance is expected! If you miss six classes, you may be dropped from the course. I do not consider absences as excused/unexcused. I also feel very strongly about students being on time to class. Being tardy twice will count as one absence! If you are in violation of the attendance policy and I do not drop you from class, a point will be deducted from your final average for each additional absence. When absent, you are expected to get all notes missed and to attempt all work. Information and assignments will be posted daily on Inquire. Communication is extremely important.

**Policy on Make-Up Work:** Make-up quizzes will be given only under the most dire of circumstances and must happen immediately! You will also have the option to drop a quiz that you have missed. If a test is missed, you need to contact me immediately to re-schedule the test. This is a topic that we will need to communicate about during the semester. If you do not complete the assigned homework and it is graded, I will not accept this as make-up work. **I do not accept late homework! I, also, do not accept late projects, papers, etc.**

**Policy on expected number of hours of work per week:** Per the Academic Catalog, “For each one-unit course, students are expected to complete 12 hours of work inside and outside of class each week.” Realistically, this may vary due to the strength of the background of each individual student with respect to course content.

**Use of Inquire:** I do use Inquire frequently to communicate with you. Assignments and announcements will be posted daily. I do post grades so the student can be aware of their progress but this is a courtesy to my students. I often post notes for upcoming material, the keys to all quizzes and tests, and videos to be watched. If you have trouble using Inquire, please contact the Help Desk in IT. I also will e-mail you often-so please check your e-mails!

Services Offered by the Goode-Pasfield Center for Learning and Teaching

The Writing Center @ Roanoke College, located on the Lower Level of Fintel Library, offers writing tutorials focused on written and oral communication for students working on writing assignments/projects in any field. Writers at all levels of competence may visit the Writing Center at any point in their process, from brainstorming to drafting to editing, to talk with trained peer tutors in informal, one-on-one sessions. The Writing Center is open Sunday through Thursday from 4 to 9 pm. Simply stop in, or schedule an appointment by going to [www.roanoke.edu/writingcenter](http://www.roanoke.edu/writingcenter), where our schedule of writing workshops and creative writing playshops is also posted. Questions? Email [writingcenter@roanoke.edu](mailto:writingcenter@roanoke.edu) or call 375-4949. Like our Facebook page for updates!

Subject Tutoring is an Internationally Certified Tutoring Center through the College Reading and Learning Association (CRLA). Our highly trained staff offers individual tutoring appointments for the following subjects: Business, Economics, Mathematics, Modern Languages, Lab Sciences & Social Sciences. Subject Tutoring is located on the lower level of Fintel Library in room 05 from 4-9 p.m. Sunday – Thursday. Students can logon to make an appointment at [www.roanoke.edu/tutoring](http://www.roanoke.edu/tutoring) in 15, 30 or 45 minute intervals. For questions or concerns, please contact Shannon McNeal at 540-375-2247 or [mcneal@roanoke.edu](mailto:mcneal@roanoke.edu).

**My hours are available for tutoring, also. I do give extra credit for attending peer tutoring. A point is given for each attendance and you may earn up to five points to be applied to each test grade. You will need to sign in at tutoring and to stay for at least 30 minutes. It is your responsibility to sign in so that I will be notified of your attendance.**

## **Special Services**

Pasfield Center for Learning and Teaching in Fintel Library. DSS provides reasonable accommodations to students with documented disabilities. To register for Disability Support Services, students must self-identify to the Office of Disability Support Services, complete the registration process, and provide current documentation of a disability along with recommendations from The Office of Disability Support Services (DSS), is located in the Goode-the qualified specialist. Please contact JoAnn Stephens-Forrest, MSW, Coordinator of Disability Support Services, at 540-375-2247 or e-mail her at: stephens@roanoke.edu to schedule an appointment. If you have registered with DSS in the past, and would like to receive academic accommodations for this semester, please contact Ms. Stephens-Forrest at your earliest convenience, to schedule an appointment.

**Grading Policy:** You will be evaluated in this course by your performance on quizzes, tests, a comprehensive exam, and homework assignments/projects/etc.

**Homework:** There are several components to this aspect of your grade.

Practice problems from the primary text and assigned readings will be given daily. **This work is not optional.** I frequently grade homework for effort. An effort grade is never dropped. I will ask that you occasionally watch videos and this would be considered effort. I also take assignments from you during your tests and grade ten selected problems for accuracy.

You will have writing assignments/projects that deal with your health issues of interest. These will include analysis of articles and papers written regarding a health issue. Examples of papers would be to pose as a lobbyist and present data or to be a doctor giving a diagnosis to a patient.

Supplemental mini-tab assignments will be given throughout the course. Minitab will be used to display statistics, simulate processes, and perform tests on data sets. The student will also interpret their results.

Small group assignments will be given. These will involve gathering data and testing of the appropriate hypothesis. The group will present a “scientific” report of their findings. Another small group assignment will be the compilation of a PSA concerning a health issue of interest.

This course also has a co-curricular requirement. The MCSP Department offers a series of discussions that appeal to a wide range of interests related to these fields of study. These sessions will engage the community to think about ongoing research, novel applications, and other issues that face our disciplines. Dates and times will be announced and posted on Inquire. You must attend one of these lectures and write a one-page reflection paper regarding the presentation. This paper must be submitted within a week of the presentation.

### **Homework will be averaged as follows:**

|                            |    |
|----------------------------|----|
| Effort                     | 2% |
| Accuracy                   | 4% |
| MCSP Lecture/Paper         | 2% |
| Paper/Project              | 4% |
| Minitab assignments        | 3% |
| PSA                        | 3% |
| Test of hypothesis         | 4% |
| Analysis of articles, etc. | 3% |

**Tests and exam:** You will have three tests during the semester and a comprehensive final. Make-up evaluations are given only under extreme and emergency circumstances and needs to happen immediately.

**Quizzes:** I will give 6-8 quizzes during the semester. These typically count 50 points each. At the end of the semester, I will drop the two lowest grades. Quizzes that are missed will typically be the grades that are dropped.

**Grades will be averaged as follows:**

|                  |     |
|------------------|-----|
| Quiz average     | 10% |
| Homework average | 25% |
| Tests (15% each) | 45% |
| Final exam       | 20% |

**Grades will be assigned using:**

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

**Note: Material, content, and scheduling are subject to change if deemed appropriate or necessary by the instructor!**

Below you will find the sequence of topics covered and the dates for quizzes and tests. If the schedule needs to be adjusted, you will receive notice of this. These dates are **anticipated dates**. The papers, group assignments, reading/writing assignments, projects, etc. will be assigned where appropriate.

We will reflect on several basic questions throughout the semester.

**Question 1: How do we convey health information and data in an unbiased and informative way?**

**Question 2: How accurate is the reporting on health issues by the media and the medical community?**

**Question 3: How do we relate our knowledge to the above questions?**

## **Topics**

### **Chapter 0: Getting Started**

#### **Part I-Exploring Data**

**Chapter 1:** Picturing Distributions with Graphs

**Chapter 2:** Describing Distributions with Numbers

**Chapter 3:** The Normal Distributions

**Chapter 4:** Scatterplots and Correlation

**Chapter 5:** Regression

#### **Part II-Producing Data**

**Chapter 8:** Producing Data: Sampling

**Chapter 9:** Producing Data: Experiments

#### **Part III-Probability**

**Chapter 11:** Introducing Probability

**Chapter 12:** General Rules of Probability

**Chapter 13:** Binomial Distributions

#### **Part IV-Inference about Variables**

**Chapter 15:** Sampling Distributions for a Proportion

**Chapter 16:** Confidence Intervals: The Basics

**Chapter 17:** Tests of Significance: The Basics

**Chapter 18:** Comparing Two Proportions

**Chapter 19:** Sampling Distribution for a Mean

**Chapter 20:** Inference about a Population Mean

**Chapter 21:** Comparing Two Means

**Chapter 22:** Inference in Practice

#### **Part V-Inference about Relationships**

**Chapter 6:** Two-Way Tables

**Chapter 24:** Two Categorical Variables: The Chi-Square Test

**Chapter 25:** Inference for Regression

**Chapter 26:** One-Way Analysis of Variance: Comparing Several Means

Chapters 27-30 will be optional.

## **Final Exam**

(Chapters 7, 10, 14, and 23 are review chapters and will be used as necessary.)

**Exam Schedule: Block 1: Friday, Dec. 16<sup>th</sup>: 8:30-11:30**  
**Block 2: Wednesday, Dec. 14<sup>th</sup>: 8:30-11:30.**

**Please plan accordingly!**

### **Evaluation schedule:**

**Tests: Test #1-September 23<sup>rd</sup>**  
**Test #2-October 26<sup>th</sup>**  
**Test #3-November 28<sup>th</sup>**

**Quizzes: Quiz #1-September 9<sup>th</sup>**  
**Quiz #2-September 16<sup>th</sup>**  
**Quiz #3-October 3<sup>rd</sup>**  
**Quiz #2-October 14<sup>th</sup>**  
**Quiz #5-November 4<sup>th</sup>**  
**Quiz #6-November 11<sup>th</sup>**  
**Quiz #7-November 21<sup>st</sup>**  
**Quiz #8: December 5<sup>th</sup>**

**Please remember that this schedule may be subject to change!!**