



## Course Syllabus – Statistical Methods

### MATH 1342.451 – Spring 2018

**Department:** Mathematics and Engineering

**Instructor:** Denise Johansen

**Discipline:** Mathematics

**Office:** RC 223D; (806)716-4632

**Course Number:** Math 1342

**Cell/Text:** (513)227-0095

**Course Title:** Statistical Methods

**Email:** djohansen@southplainscollege.edu

**Credit:** 3 **Lecture:** 3 **Lab:** 0

**Time/Place:** ARR/Internet

**Office Hours:** MTWR 8-8:30am and 10:30am-11am, TR 2:30pm-4pm, F 9am-12pm, or by appointment

**This course satisfies a core curriculum requirement:** Yes – mathematics

**Prerequisites:** 2 years of high school algebra or Math 0320, TSI compliance

**Available Formats:** conventional/internet

**Campuses:** Levelland Campus, Reese Campus, Plainview

**Textbook (Optional): Elementary Statistics: Picturing the World 6/e**, Farber, Betsy | Larson, Ron. Pearson. ISBN-13: 9780321911216.

**Supplies (Required):** TI-83/84 Calculator, MyMathLab access (Course ID: **Johansen73833**).

**Course Description:** This course is a study of the methods of analyzing data, statistical concepts and models, estimation, tests of significance, introduction to analysis of variance, linear regression, and correlation.

**Course Purpose/Rationale/Goal:** To provide a transferable course in the elements of statistical methods.

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**Course Delivery:** This course is an online course, so you will access course information and correspond with me through use of the internet. I use MyMathLab to deliver and manage this course. I am available by phone or face-to-face visit in my office on the Reese campus during my posted office hours. I can also be reached by phone or text using my cellphone number (513-227-0095) during reasonable hours. If we can work out the technology, I will also hold a weekly webinar in the evening where you can call in to ask questions and see a virtual whiteboard where we can work out problems together.

**Course Requirements:** To maximize the potential to complete this course, a student should login to MyMathLab at least 3 times a week, watch the required lecture videos and take notes, thoroughly complete all homework assignments, and prepare well for examinations, including final examinations. Additionally, students are expected to check and respond to email communications.

### Course Evaluation:

- Exploration assignments^ for each section will be posted in MyMathLab and will contain video lectures, vocabulary/concept check questions, and sometimes applet animations or StatCrunch exercises. The Exploration average will be worth 10% of your grade, and the lowest 3 Exploration grades will be dropped.
- Homework assignments^ for each section will be posted in MyMathLab. The homework average is worth 15% of your grade, and the lowest 3 homework grades will be dropped.
- There will be 9 online Quizzes^ to be **completed on your own and without references**. The Quiz Average is worth 10% of your grade, and the lowest 2 quiz grades will be dropped.
- There will be 3 in-class, paper/pencil/calculator exams, proctored by your high school teacher and graded by me. These will each be worth 15% of your grade.
- There will be a 2-part in-class cumulative final exam on **Monday, May 7<sup>th</sup> and Wednesday, May 9<sup>th</sup>**, worth 20% of your grade.

^All online assignments will be due by 11:59pm on Mondays of the following week.

### Letter Grades:

90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
59% & below	F

### Student Learning Outcomes/Competencies:

Upon completion of this course and receiving a passing grade, the student will be able to:

1. represent raw data using frequency distributions
2. represent raw data using polygons, ogives, histograms, and pie charts
3. calculate measures of central tendency, variation, and position for both grouped and ungrouped data and interpret in writing the significance and meaning of the calculations

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4. calculate coefficients of variation and skewness and interpret in writing the significance of the calculations
5. calculate classical and empirical probabilities
6. apply binomial, Poisson, and normal distribution properties to calculate probabilities and interpret in writing the significance of the calculations
7. calculate mean, variance, and standard deviations of probability distributions and interpret in writing the significance of test results
8. evaluate a hypothesis testing situation to determine the appropriate test to be used
9. use parametric and non-parametric tests for hypothesis testing and interpret in writing the significance of test results
10. calculate simple and multiple linear regression equations and use equations to make predictions
11. calculate coefficients of correlation, determination, and non-determination and interpret in writing the significance of the calculations
12. use a computer statistics program and/or a statistical calculator to help with computations

### Core Objectives:

#### Communication Skills:

effective development, interpretation, and expression of ideas through written, oral, and visual communication.

- Develop, interpret, and express ideas through written communication
- Develop, interpret, and express ideas through oral communication
- Develop, interpret, and express ideas through visual communication

#### Critical Thinking:

creative thinking, innovation, inquiry, analysis, evaluation, and synthesis of information.

- Generate and communicate ideas by combining, changing, and reapplying existing information
- Gather and assess information relevant to a question
- Analyze, evaluate, and synthesize information

#### Empirical and Quantitative Competency Skills:

the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

- Manipulate and analyze numerical data and arrive at an informed conclusion
- Manipulate and analyze observable facts and arrive at an informed conclusion

**Attendance Policy:** Because this is an online class, there are no scheduled meetings other than the dates that you are taking in-class exams. For our purposes, you must login to MyMathLab

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and work on at least 1 assignment per week (except for the week of Spring Break). Failure to login or do any work for 2 weeks in a row will result in you being administratively withdrawn from the course with a grade of 'F' or 'X'.

**Last day to drop is Thursday, April 27<sup>th</sup>.**

### **SPC School Holidays:**

Monday, 1/15, Martin Luther King Holiday

Monday-Friday, 3/12-3/16, Spring Break

Monday, 4/2, Easter Holiday

### **FHS School Holidays:**

Monday, 1/15, Martin Luther King Holiday

Monday, 2/19, Presidents' Day/Staff Development

Monday-Friday, 3/12-3/16, Spring Break

Friday, 3/30, Good Friday Holiday

Monday, 4/2, Bad Weather Day

**Academic Integrity:** It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own any work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension.

**Cheating:** Dishonesty of any kind on examinations or on written assignments, illegal possession of examinations, the use of unauthorized notes during an examination, obtaining information during an examination from the textbook or from the examination paper of another student, assisting others to cheat, alteration of grade records, illegal entry or unauthorized presence in an office are examples of cheating. Complete honesty is required of the student in the presentation of any and all phases of course work. This applies to quizzes of whatever length, as well as to final examinations, to daily reports and to term papers.

**Language:** Please be respectful of others and use language that is appropriate to the workplace.

**Equal Opportunity:** South Plains College strives to accommodate the individual needs of all students in order to enhance their opportunities for success in the context of a comprehensive community college setting. It is the policy of South Plains College to offer all educational and employment opportunities without regard to race, color, national origin, religion, gender, disability, or age.

**Disability Statement:** Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Special Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Special Services Coordinator. For more information, call or visit the Special Services Office in the Student Services Building, 716-2529 or 716-2530.

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## COURSE OUTLINE / CALENDAR\*

Problems are assigned online for each section of the textbook that we cover. To access online assignments, you must have an access code (you can buy a code for MyMathLab bundled with your textbook or you can buy just the code at [www.mymathlab.com](http://www.mymathlab.com)) and register for our course (Course ID: **Johansen73833**) at [www.mymathlab.com](http://www.mymathlab.com). Assignments have due dates, and you will lose 10% per day for work completed after the due date passes. To master the material and prepare for the exams, you **MUST** work extra problems!

\* Assignments and deadlines are subject to change at instructor's discretion, and all changes will be announced in class and posted in MyMathLab.

Date	Content	Assignments
Week 1 1/15-1/21	<b>Introduction to Statistics (Part 1)</b> <ul style="list-style-type: none"> <li>• <b>Martin Luther King, Jr. Holiday – No Classes!</b></li> <li>• 1.1 – An Overview of Statistics</li> </ul>	Read Section 1.1 MML Orientation MML Explore 1.1 MML Hwk 1.1 <b>Due 11:59pm, 1/22</b>
Week 2 1/22-1/28	<b>Introduction to Statistics (Part 2) &amp; Descriptive Statistics (Part 1)</b> <ul style="list-style-type: none"> <li>• 1.2 – Data Classification</li> <li>• 1.3 – Data Collection and Experimental Design</li> <li>• 2.1 – Frequency Distributions and Their Graphs</li> </ul>	Read Sections 1.2, 1.3, 2.1 MML Explore 1.2, 1.3, 2.1 MML Hwk 1.2, 1.3, 2.1 MML Quiz 1 – Chapter 1 <b>Due 11:59pm, 1/29</b>
Week 3 1/29-2/4	<b>Descriptive Statistics (Part 2)</b> <ul style="list-style-type: none"> <li>• 2.2 – More Graphs and Displays</li> <li>• 2.3 – Measures of Central Tendency</li> <li>• 2.4 – Measures of Variation</li> </ul>	Read Sections 2.2-2,4 MML Explore 2.2-2,4 MML Hwk 2.2-2,4 <b>Due 11:59pm, 2/5</b>
Week 4 2/5-2/11	<b>Descriptive Statistics (Part 3) &amp; Probability (Part 1)</b> <ul style="list-style-type: none"> <li>• 2.5 – Measures of Position</li> <li>• 3.1 – Basic Concepts of Probability and Counting</li> <li>• 3.2 – Conditional Probability and the Multiplication Rule</li> </ul>	Read Sections 2.5, 3.1-3.2 MML Explore 2.5, 3.1-3.2 MML Hwk 2.5, 3.1-3.2 MML Quiz 2 – Chapter 2 <b>Due 11:59pm, 2/12</b>
Week 5 2/12-2/18	<b>Probability (Part 2) &amp; Exam I</b> <ul style="list-style-type: none"> <li>• 3.3 – The Addition Rule</li> <li>• Review for Exam I</li> <li>• <b>Exam I (Chapters 1-3)</b></li> </ul>	Read Section 3.3 MML Explore 3.3 MML Hwk 3.3 MML Quiz 3 – Chapter 3 MML Exam I Review <b>Due 11:59pm, 2/19</b>

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Week 6 2/19-2/25	<b>Discrete Probability Distributions</b> <ul style="list-style-type: none"> <li>• <b>President's Day Holiday – No FHS Classes!</b></li> <li>• 4.1 – Probability Distributions</li> <li>• 4.2 – Binomial Distributions</li> </ul>	Read Sections 4.1-4.2 MML Explore 4.1-4.2 MML Hwk 4.1-4.2 MML Quiz 4 – Chapter 4 <b>Due 11:59pm, 2/26</b>
Week 7 2/26-3/4	<b>Normal Probability Distributions (Part 1)</b> <ul style="list-style-type: none"> <li>• 5.1 – Introduction to Normal Distributions and the Standard Normal Distribution</li> <li>• 5.2 – Normal Distributions: Finding Probabilities</li> <li>• 5.3 – Normal Distributions: Finding Values</li> </ul>	Read Sections 5.1-5.3 MML Explore 5.1-5.3 MML Hwk 5.1-5.3 <b>Due 11:59pm, 3/5</b>
Week 8 3/5-3/11	<b>Normal Probability Distributions (Part 2) &amp; Confidence Intervals (Part 1)</b> <ul style="list-style-type: none"> <li>• 5.4 – Sampling Distributions and The Central Limit Theorem</li> <li>• 6.1 – Confidence Intervals for the Mean (Large Samples)</li> <li>• 6.2 – Confidence Intervals for the Mean (Small Samples)</li> </ul>	Read Sections 5.4, 6.1-6.2 MML Explore 5.4, 6.1-6.2 MML Hwk 5.4, 6.1-6.2 MML Quiz 5 – Chapter 5 <b>Due 11:59pm, 3/19</b>
3/12-18	<b>Spring Break – No Classes!</b>	
Week 9 3/19-3/25	<b>Confidence Intervals (Part 2) &amp; Exam II</b> <ul style="list-style-type: none"> <li>• 6.3 – Confidence Intervals for Population Proportions</li> <li>• Review for Exam II</li> <li>• <b>Exam II</b> (Chapters 4-6)</li> </ul>	Read Section 6.3 MML Explore 6.3 MML Hwk 6.3 MML Quiz 6 – Chapter 6 MML Exam II Review <b>Due 11:59pm, 3/26</b>
Week 10 3/26-4/1	<b>Hypothesis Testing with One Sample (Part 1)</b> <ul style="list-style-type: none"> <li>• 7.1 – Introduction to Hypothesis Testing</li> <li>• 7.2 – Hypothesis Testing for the Mean (Large Samples)</li> <li>• <b>Good Friday Holiday – No FHS Classes!</b></li> </ul>	Read Sections 7.1-7.2 MML Explore 7.1-7.2 MML Hwk 7.1-7.2 <b>Due 11:59pm, 4/2</b>
Week 11 4/2-4/8	<b>Hypothesis Testing with One Sample (Part 2)</b> <ul style="list-style-type: none"> <li>• <b>Easter Holiday – No FHS Classes!</b></li> <li>• 7.3 – Hypothesis Testing for the Mean (Small Samples)</li> <li>• 7.4 – Hypothesis Testing for Proportions</li> </ul>	Read Sections 7.3-7.4 MML Explore 7.3-7.4 MML Hwk 7.3-7.4 MML Quiz 7 – Chapter 7 <b>Due 11:59pm, 4/9</b>

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Week 12 4/9-4/15	<b>Hypothesis Testing with Two Samples (Part 1)</b> <ul style="list-style-type: none"> <li>• 8.1 – Testing the Difference Between Means (Large Independent Samples)</li> <li>• 8.2 – Testing the Difference Between Means (Small Independent Samples)</li> <li>• 8.3 – Testing the Difference Between Means (Dependent Samples)</li> </ul>	Read Sections 8.1-8.3 MML Explore 8.1-8.3 MML Hwk 8.1-8.3 <b>Due 11:59pm, 4/16</b>
Week 13 4/16-4/22	<b>Hypothesis Testing with Two Samples (Part 1) &amp; Exam III</b> <ul style="list-style-type: none"> <li>• 8.4 – Testing the Difference Between Proportions</li> <li>• Review for Exam III</li> <li>• <b>Exam III</b> (Chapters 7-8)</li> </ul>	Read Section 8.4 MML Explore 8.4 MML Hwk 8.4 MML Quiz 8 – Chapter 8 MML Exam III Review <b>Due 11:59pm, 4/23</b>
Week 14 4/23-4/29	<b>Correlation and Regression</b> <ul style="list-style-type: none"> <li>• 9.1 – Correlation</li> <li>• 9.2 – Linear Regression</li> <li>• 9.3 – Measures of Regression and Prediction Intervals</li> </ul>	Read Sections 9.1-9.3 MML Explore 9.1-9.3 MML Hwk 9.1-9.3 MML Quiz 9 – Chapter 9 <b>Due 11:59pm, 4/30</b>
Week 15 4/30-5/6	<b>Analysis of Variance &amp; Review for Final Exam</b> <ul style="list-style-type: none"> <li>• 10.4 – Analysis of Variance</li> <li>• Review for Final Exam</li> </ul>	Read Section 10.4 MML Explore 10.4 MML Hwk 10.4 MML Final Exam Review <b>Due 11:59pm, 5/7</b>
Week 16 5/7-5/9	<b>Final Exam</b> <ul style="list-style-type: none"> <li>• <b>Final Exam – Part 1</b> (Chapters 1-5)</li> <li>• <b>Final Exam – Part 2</b> (Chapters 6-10)</li> </ul>	

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