

Course Information

Number:	MS301
Name:	Statistical Inference and Decision Making
Description:	This is a survey course in applied statistical analysis using both spreadsheets and a professional level statistical software package (such as Minitab or SPSS). Topics include analytical and graphical methods of collecting, summarizing and describing data; basic probability laws, rules and types; statistical inference, interval estimation, techniques for comparing two or more populations and models for prediction. This course emphasizes applications and interpretation of statistical results.
Credit(s):	3
Offered (DAY schedule):	Every semester
Instructor Permission Required:	N
Pre-Requisite(s):	MS120 or equivalent

Course Objectives

Upon completion of this course, students will minimally be able to: 1. Summarize and Graph Data using an appropriate graph. 2. Describe, Explore and Compare Data using Measures of Center and Measures of Variation. 3. Compute Probabilities using Addition and Multiplication Rules as well as Complements and Conditional Probability. 4. Apply Counting Principles. 5. Compute and Interpret Probability for Discrete and Continuous Probability Distributions. 6. Utilize Confidence Intervals. 7. Calculate appropriate Sample Sizes for tests of Proportions and Means.



MS301

**Statistical Inference and Decision Making
Thomas College**

Fall 2018

INSTRUCTOR: Dr. Anne-Marie Thibodeau
e-mail: thibodeaua@thomas.edu
Office: AD110
Ext. 356
Office Hours: M-W-F 10:00–11:00 a.m., or by appt.

TEXTBOOK: Elementary Statistics using Excel, 6th ed., by Mario Triola
WITH ACCESS to MyMathLab (required). Purchase ACCESS code with new textbook, or,
register (and pay) directly at start of class when Professor provides you with Course ID:
<http://www.pearsonmylabandmastering.com/northamerica/mymathlab/>

TECHNOLOGY: MS Excel, MyMathLab

COURSE DESCRIPTION:

This is a survey course in applied statistical analysis using both spreadsheets and professional level statistical software. Topics include analytical and graphical methods of collecting, summarizing and describing data; basic probability laws, rules and types; statistical inference, interval estimation, techniques for comparing two or more populations and models for prediction. This course emphasizes applications and interpretation of statistical results.

COURSE OBJECTIVES:

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1. Summarize and Graph Data using an appropriate graph.
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3. Compute Probabilities using Addition and Multiplication Rules as well as Complements and Conditional Probability.
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5. Compute and Interpret Probability for Discrete and Continuous Probability Distributions.
6. Utilize Confidence Intervals.
7. Calculate appropriate Sample Sizes for tests of Proportions and Means.

HOMEWORK:

Homework will be assigned and graded. **Homework must be submitted by the class meeting for which it was assigned. Late homework will be graded as '0'.** Homework must be completed in MyMathLab for the designated course; therefore, Access and registration to MyMathLab is required and must be purchased by the 1st week of class.

IF STUDENT HAS NOT CREATED AN ACCOUNT IN MYMATHLAB BY **9/5/2018**, HE/SHE WILL BE DROPPED FROM THIS COURSE.

If two or more weeks' worth of assignments are not submitted in MyMathLab, student will be dropped from this course.

Makeup Exams/Quizzes will not be given except under rare circumstances that will require official documentation (e.g., medical emergency room records), proof that the event was a non-reschedulable EMERGENCY.

GRADING: Assignments: 15%
Exams (3): 60% (each weighted equally)
Final Exam 25%

PLEASE NOTE: Final Exam week is Dec. 10 - 14. **Attendance at Scheduled Final Exam is REQUIRED!**

GRADING RANGE:

94	-	100	A	73	-	75	C
90	-	93	A-	70	-	72	C-
86	-	89	B+	66	-	69	D+
83	-	85	B	63	-	65	D
80	-	82	B-	60	-	62	D-
76	-	79	C+	0	-	59	F

ATTENDANCE:

Class attendance is essential and is expected.

ACADEMIC HONESTY POLICY:

Academic honesty, mutual respect, being on time for class, giving full attention to class work is expected in this course. **Any form of cheating will not be tolerated.** If a student is caught cheating or plagiarizing, an appropriate punishment will be administered, ranging from a failing grade on the specific project/homework/quiz/exam to failure of the course. Academic misconduct is defined in Thomas College Course Catalog, Pg. 47. Excerpts from same are as follows:

Plagiarizing. According to the 2009 *MLA Handbook*, “to *plagiarize* means to ‘to commit literary theft’ and to ‘present as new and original an idea or product derived from an existing source’ (Merriam-Webster’s Collegiate Dictionary [11th ed.; 2003; print]) (52). The *Handbook* continues, “Plagiarism involves two kinds of wrongs, using another person’s ideas, information, or expressions without acknowledging that person’s work constitutes intellectual theft. Passing off another person’s idea’s, information, or expressions as your own to get a better grade or gain some other advantage constitutes fraud.” (52)....

Aiding and abetting plagiarism. Permitting others to use your work.

Recycling your own work. Submitting, without permission, in one course work originally done for another.

Cheating. Copying from another student’s exam paper; permitting others to copy one’s work; bringing unauthorized material to exams; accepting or giving unauthorized assistance on coursework and/or assignments.

STUDENTS WITH DISABILITIES

Students requiring academic accommodations to be successful in this course are encouraged to arrange a meeting with the Academic Dean as soon as possible. At that meeting, strategies for success will be discussed, as well as any accommodations required for the classroom, which will then be communicated with the instructor.

USE OF ELECTRONIC DEVICES IN THE CLASSROOM:

It is expected that all personal electronic devices (e.g., cell/smart phones, personal laptops, PDA's, MP3 players, cameras, tablets, IPADS, etc.) will be **turned off and packed away during class sessions**. Students may not post ANY material from classes on the internet or other personal networking sites without the explicit, written permission of the instructor and all other class participants. The use of technology in class will be strictly limited to appropriate, course relevant use. All other uses (including, but not limited to, **texting, emailing, instant messaging, social networking, and listening to iPods**) are **prohibited** unless specifically approved by the course instructor. Penalties for violation of this policy will result in removal from the class and repeated violations may result in failure of the course. **Personal electronic devices will be collected at the start of class on the day of an exam and will be returned upon receipt of completed exam.**

TENTATIVE COURSE OUTLINE:

Chapters Covered	Week (Tentative)
1. Intro. to Statistics	1
2. Summarizing and Graphing	1-2
3. Stats. to Describe/Explore/Compare Data	3
First Exam	4
4. Probability	5-7
5. Discrete Probability Distributions	8
Second Exam	9
6. Normal Probability Distributions	10-11
7. Estimates and Sample Sizes	12-13
8. Hypothesis Testing	14
Third Exam	15
Final Exam	
(Other chapters covered as time permits.)	

Students must have both their Thomas computer and Moodle accounts established the first week of class. Please contact IT services to do so if that has not already been established.

ADD/DROP DATES

Oct. 29th is the last day to drop a course for Fall semester 2018.

THOMAS COLLEGE
Waterville, Maine
Department of Arts and Sciences
Fall 2018

Course Number: MS301

Credit Hours: 3

Course Title: Statistical Inference and Decision Making.

Clock Hours: 45

Instructor: Andres E. Morales

Office: Room AD109

Office Hours: Monday – Friday 11:00 am to 12:00 pm

Others: By appointment

e-mail: moralesa@thomas.edu

Required Text: Triola, Mario F., *ELEMENTARY STATISTICS Using Excel*® 6th Edition, Pearson 2018, with MyMathLab access card (required)
ISBN: 9780134763767. Purchase ACCESS code with new textbook, or, register (and pay) directly at start of class when Professor provides you with Course ID:
<http://www.pearsonmylabandmastering.com/northamerica/mymathlab/>

Technology: Statdisk, Excel, Minitab and Hand Calculators.

Course Description: This is a survey course in applied statistical analysis using Excel. Topics include analytical and graphic methods of collecting, summarizing and describing data; basic probability laws, rules and types; statistical inference, interval estimation, techniques for comparing two or more populations and models for prediction. This course emphasizes applications and interpretation of statistical results.

Course Objectives and Outline:

This course will proceed in concert with the learning objectives of Thomas College as represented in the core competences. Therefore, one of the main goals will be to develop an ability to communicate effectively and persuasively using a variety of forms including visual, tabular and conceptual models. Students will also be expected to demonstrate the ability to apply analytical and mathematical concepts and to communicate their findings using the most appropriate approach for a specific problem or project.

Upon completion of this course, the student should be able to:

- Know the difference between Description and Inference; between accuracy and precision and between calculating statistics and the “management interpretations” for those statistics. Effective and accurate communication is emphasized throughout.
- Know the important role of technology in statistical analysis and how to choose the correct statistical procedure for a given task or objective. Understand why the statistical software used by professionals is necessary for the analysis of real data; how spreadsheets compare and contrast with applied statistical software.

Course Requirements:

It is highly recommended to read the book before class. It will be crucial for the discussion of topics, concepts and applications.

Grading:

Homework Assignments	25%
Tests/Quizzes	40%
Attendance and participation	10%
Final Exam	25%

Grading Ranges:

96 --- 100	A	66 --- 70	C
91 --- 95	A-	61 --- 65	C-
86 --- 90	B+	59 --- 60	D+
81 --- 85	B	57 --- 58	D
76 --- 80	B-	55 --- 56	D-
71 --- 75	C+	Under 55	F

There will be assignments and quizzes throughout the semester. Assignments and/or quizzes that do not show the necessary work to reach the corresponding answers will not get any credit. Final exam will be held in the finals week and attendance is mandatory.

Homework and Study Plan:

Homework will be worked out online: www.mymathlab.com. Registration is mandatory to have access to homework and study plan, as well as to the e-version of the book. Instructions on how to register will be posted on Moodle. Once homework is past due, there will be no chance for late submissions in MyMathLab, so it is important to keep checking homework due dates.

IF STUDENT HAS NOT CREATED AN ACCOUNT IN MYMATHLAB BY **09/14/2018**, HE/SHE WILL BE DROPPED FROM THIS COURSE.

If more than two weeks' worth of assignments are not submitted in MyMathLab, student will be dropped from this course.

Exams/Tests/Quizzes

Exams/Tests/Quizzes will be given at the end of each major section of the class. Exams may be projects combining math completed by hand and math completed using a spreadsheet, or may be solely one or the other.

Attendance:

Attendance is essential and required. If it is necessary to miss a class, you must notify the instructor via e-mail, or in person "prior" to the absence. Any make-up work allowed for these absences will take place at the instructor's discretion. Failure to either contact the instructor before the absence or to complete the makeup work in a timely manner, typically one week, will result in a grade of "0". Students will start with a 100 for an attendance grade. Then, 10 Points will be subtracted for each absence.

Academic Honesty Policy:

Academic honesty, mutual respect, being on time for class, giving full attention to class work, not reading newspapers or other non-class related material, not using cell phones or pagers during class time are expected in this course. Academic misconduct, as defined by Thomas College, will not be treated lightly.

Tentative Course Outline

Week	Topic
1	Introduction to Statistics. Types of data, collecting sample data, frequency distributions, histograms and statistical graphics
2	Describing, exploring and comparing data. Measures of center, variation and relative standing. Boxplots.
3 – 4	Probability. Basic concepts, addition and multiplication rules. Conditional probability, simulations, counting, Bayes' Theorem.
5	Discrete probability distributions. Random variables, binomial distribution; mean, variance, and standard deviation for the binomial distribution. The Poisson distribution.
6 – 7	Normal probability distribution. The standard normal distribution, applications of normal distribution, sample distributions and

estimators. The central limit theorem, normal as an approximation to binomial, assessing normality.

- 8 Estimates and sample sizes. Estimating a population proportion. Estimating a population mean and variance.
- 9 Hypothesis testing. Basics. Testing claims about: proportion, mean, and variance.
- 10 - 11 Inferences from two samples. Inferences about two proportions, about two means: independent samples. Inferences from dependent samples. Comparing variation in two samples.
- 12 - 13 Correlation and regression. Correlation, regression, variation and prediction values. Multiple regression, modeling.
- 14 - 15 Analyses of Variance (ANOVA). One-way ANOVA and two-way ANOVA.

Final Exam.