



WHITE MOUNTAINS COMMUNITY COLLEGE

2020 Riverside Drive, Berlin, NH 03570

COURSE SYLLABUS

<u>MAT214</u>	<u>Statistics</u>
Course Number	Title
<u>Fall/Spring 2013-2014</u>	<u>Oxbow HS Bradford VT</u>
Semester	Location

Daniel Lemay  
Instructor

05/15/13  
Date

**COURSE NUMBER AND TITLE:** STATISTICS MAT214

**CATALOG DESCRIPTION:** Description: An introductory statistics course. Topics covered include methods of obtaining, analyzing and presenting data, elementary probability, probability distributions, confidence intervals, hypothesis testing, linear regression and correlation. 4 credits.

**PREREQUISITE:** College Math or permission of instructor/Oxbow Mathematics Department

Class Hours: 0.75 hours daily, full year

Lab Hours: 0

Credit Hours: 4

**INSTRUCTOR:**

Instructor:  
Daniel Lemay

Office Hours:  
W/Th 2:30 to 3:15 other times by  
appointment

**Email:** [dlemay@oxbowhs.org](mailto:dlemay@oxbowhs.org)  
**Phone (school):** (802) 222-5214 ext 202

**TEXTBOOK(S) REQUIRED:**

Triola, Mario Elementary Statistics Using the TI-83/84 Plus Calculator, 3/E ISBN 9780321641489

**GENERAL OBJECTIVES OF COURSE:**

- You will be able to organize and present data graphically.
- You will be able to calculate measures of central tendency and variation.
- You will understand probability theory.
- You will learn to calculate confidence intervals.
- You will perform hypothesis tests involving the mean and proportion.
- You will use technology to analyze and interpret data.

**LEARNING ACTIVITIES:**

Lectures, Guided practice, class/group explorations, Online and paper based homework

**LIBRARY RESOURCES:**

There are many library resources available in our library. Please contact the library staff for more information. In addition students who take advantage of the Running Start option available for this course and register for WMCC's course will have access to all the resources available to on-campus students at the WMCC Fortier Library (<http://www.wmcc.edu/services/lib/>) on the Berlin campus. These students will also be sent information about how to access electronic resources such as catalogs, books, database searches available to Running Start students through the Fortier Library.

## **GRADING POLICY:**

Every graded assignment will be awarded a designated number of points. Each marking period's grade will be determined using a running total of points earned by points possible. The average (mean) of each marking period, two 90 minute comprehensive exams and a culminating final project will determine your grade for Running Start WMCC credit.

In addition to homework, quizzes/tests, in class explorations, you are responsible for one project each semester. Details at the end of this syllabus.

Please note that for students taking the course for WMCC credit, WMCC assigns letters grades using these numerical equivalencies:

There is no B+ : 87-89    C+ : 77-79    D+ : 67-69    F: Below 60  
A+ grade.

A: 93-100    B : 83-86    C: 73-76    D: 63-66

A-: 90-92    B-: 80-82    C-: 70-72    D-: 60-62

## **INSTRUCTOR'S POLICIES:**

**ACADEMIC HONESTY** – Original thinking and intellectual honesty are central to a college education. Research projects require the ongoing use of existing works, but students must conduct themselves with proper regard for the rights of others and of the college, in a context of mutual respect, integrity and reason. Activities such as plagiarism and cheating are not acceptable and will not be condoned by the college. Students involved in such activities are subject to serious disciplinary action. The following are presented as examples of academic dishonesty:

1. Misrepresenting academic work done by someone else as one's own efforts, with or without permission of the person.
2. Providing or using prohibited assistance in assignments and examinations.
3. Unauthorized communication in any manner with other students during an examination; collaboration in the preparation of reports or take-home examinations; copying, giving aid or failing to follow the faculty member's instructions.
4. Tampering with or falsifying official college records.
5. Infringing upon the right of other students to fair and equal access to college library materials and comparable academic resources.
6. Falsification of data collected for and presented as part of course requirements.
7. Presenting as one's own ideas, another person's work or words without proper acknowledgment.

There may be other instances of academic dishonesty, which will be identified by a faculty member.

**REQUIRED TOOLS OR EQUIPMENT:**

TI-84-Plus or higher graphing calculator.

**SPECIFIC DIRECTIONS OR RECOMMENDATIONS:**

Please be advised that students currently receiving modifications in an IEP under the Individuals with Disabilities Education Act and Section 504 of the Rehabilitation Act will not be eligible for those same modifications in a college course in the Running Start program. While students may be eligible for accommodations through the college's Disabilities Services Office, students must be otherwise qualified to do college level work and address the essential elements of the course without fundamental alterations to the curriculum. If you have questions, please contact the Disabilities Coordinator at the White Mountains Community College or the Running Start Coordinator at WMCC.

**DISCRIMINATION POLICY:** White Mountains Community College does not discriminate on the basis of race, color, national origin, sex, age or handicap in admission or access to, or treatment or employment in, its programs and activities. Any persons having inquiries concerning White Mountains Community College's compliance with the regulations implementing Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, or Section 504 of the Rehabilitation Act of 1973 is directed to contact Peg Heaney, 2020 Riverside Drive, Berlin, NH 03570. Peg Heaney has been designated by White Mountains Community College to coordinate the institution's efforts to comply with the regulations implementing Title VI, Title IX and Section 504. Any person may also contact the Assistant Secretary for Civil Rights, U.S. Department of Education, or the Director, U.S. Department of Education, Office for Civil Rights, Region 1, 140 Federal Street, Boston, MA, 02110.

Course # MAT 214

**COURSE TIMETABLE**

Week of	Objectives	Assignment
08/28/13	How the class runs Registering for Moodle MathXL	
09/03/13	Identify Types of Variables and Collection Methods Triola Chapter 1	MathXL Assignment 1. Learning to use MML 2. Week 1 Assignment Moodle: HTLWS Chapter 1
09/09/13	Describing Distributions with Graphs: Shapes Triola Chapter 2	MathXL Assignment Week 2 Assignment Moodle: HTLWS Chapter 2
09/16/13	Measures of Center Triola Section 3.2	First Exam MathXL Assignment Week 3 Assignment Moodle: HTLWS Chapter 3
09/23/13	Measures of Spread Triola Section 3.3	Quiz MathXL Assignment Week 4 Assignment Moodle: HTLWS Chapter 4
09/30/13	Measures of Relative Standing Triola Section 3.4	Quiz MathXL Assignment Week 5 Assignment Moodle: HTLWS Chapter 5
10/07/13	Study for Exam 2 Marking Period 1 Data Collection Project	Exam 2 Data Collection
10/14/13	Correlation and Regression Part 1 Triola Sections 10.2 and 10.3	MathXL Week 7 Assignment Moodle: HTLWS Chapter 6 Working on your data project
10/21/13	Regression Part 2 Triola Sections 10.6	MathXL Week 8 Assignment Moodle: HTLWS Chapter 7 Working on your data project

10/28/13	Study for Exam 3 Put finishing touches on Data Collection Project	MathXL Week 9 Assignment Moodle: HTLWS Chapter 8 Finish Posting your Data Collection Project <b>End of Marking Period 1</b>
11/04/13	Examination Second Marking Period Project assigned Probability Basics Triola Sec 4-2	Exam 3 Moodle: HTLWS Chapter 9 Writing Your Mini-Proposal for Data Collection Project 2
11/11/13	Probability: Addition Rule and Multiplication Rule Triola Sec 4-3 and 4-4	MathXL Week 10 Assignment Moodle: HTLWS Chapter 10 Data Collection
11/18/13	Probability: Using Simulation to estimate Probabilities and Probabilities: Counting Rules(Permutations/Com binations/Fundamental Counting Principal) Triola Section 4-6	Quiz MathXL Week 11 Assignment Data Collection
11/25/13	Time in class to produce data tables and analysis of collected data. Produce wiki pages of your results.	<b>Fall project pages due by Thanksgiving Break</b>  <b>Peer review of two other people's projects due by Christmas Break</b>
12/06/13	Probability Distributions Triola Section 5-2	MathXL Week 12 Assignment Commenting on Data Collection Projects
12/09/13	Binomial Distributions Triola Section 5-3	MathXL Week 13 Assignment Commenting on Data Collection Projects
12/16/13	Binomial Distributions Triola Sections 5-4 Means/SD and associated probabilities	MathXL Week 14 Assignment Commenting on Data Collection Projects Due Friday 12/19/13
01/02/13	Review for Mid-year Exam	Exam Review both online @ MathXL and in class
01/06/13	Preparation for Mid Year Exams	Exam Review both online @ MathXL and in class

01/13/13	Mid Year Examination	Note This exam is 17% of the Final Grade for WMCC Credit
01/21/13	Normal Distribution Mechanics and Applications Triola Section 6-2/6-3	MathXL Week 15 Assignment
01/27/13	Assessing Normality Triola Section 6-5	Quiz MathXL Week 16 Assignment
02/03/13	Estimating Population Parameters (Proportions and means) Triola Sec 7-2 and 7-4	Quiz MathXL Week 17 Assignment
02/10/13	Significance Testing (Means and proportions) Triola Section 8-2, 8-3, 8-5	Quiz MathXL Week 18 Assignment
02/17/13	Catching up. Review / Practice Take an exam	Exam due by Midnight Tuesday night March 4th <b>Winter Break Begins</b>
03/05/13	Inference for two population proportions Triola sections 9-2	MathXL Week 19 Assignment
03/10/13	Inference for two population means: 9-3 and 9-4	Quiz MathXL Week 19 Assignment
03/17/13	Inference for regression/Multiple Linear regression Triola Sections 10-4, 10-5, 10-6	Quiz MathXL Week 20 Assignment
03/24/13	Chi-Square Goodness of Fit Triola 11-2	MathXL Week 20 Assignment Quiz Due Sunday night March 30
03/31/13	Contingency Tables and the chi-square test statistic Triola 11-3	<b>End of Quarter 3</b> MathXL Week 21 Assignment + Quiz Due Sunday Night April 6
04/07/13	One-way ANOVA and Post-Hoc testing Triola Sec 12-1	MathXL Week 22 Assignment +Quiz Due Sunday night April 13

04/14/13		Spring Break
04/28/13	Working with Non-Parametric Tests: Sign-Test and the Wilcoxon Signed Ranks Test for Matched Pairs	MathXL Week 23 Assignment and Quiz Due Sunday night 5/4
05/05/13	Wilcoxon Rank-Sum test for two Independent Samples, Kruskal-Wallis Test (ANOVA Replacement), the Runs Test	MathXL Week 24 assignment and Quiz Due Sunday night 5/11
05/12/13	Final Spring Project Design and data collection	MathXL final Exam Due June 5 at midnight
05/19/13	Working on final project	
05/26/13	Working on Final Project	
06/02/13	Presentations	Paper +Slideshow+Presentations due



## Fall Semester Project

See the Moodle Course Portal for a hyperlinked version

Think of two pairs of quantitative variables whose relationship you might be interested in studying. (Remember that a quantitative variable is any characteristic of a person or object that can assume a range of numerical values. Be very specific in describing these variables; identify the observational units 1 as well as the variables

Your final published article will involve creating and performing your own experiment. It must involve measurable quantitative bivariate data with some EXPECTED relationship. You should have at least 30 data pairs (only with permission may you have less). You must MEASURE THE DATA YOURSELF. In other words, you may not get it from a book, the Internet, a printed list, or by asking someone else, etc. Try NOT to pick a "perfect" scientific relationship.

In the past students have done such crazy things as:

How long it takes x numbers of chocolate chips to melt (See links)

How many days past the full moon vs number of student incidents in a classroom (See links)

Throwing Things: (See links)

Please do something you are interested in. Of course, since you only have two quantitative variables in this experiment, it will be limited.

Due 10/28/2011

Mini-Proposal

Write just enough so someone else can clearly understand what you are thinking of doing without having to ask you to explain it:

- What is the research question? Be very specific about exactly what you are going to measure. What is the case? What are the two variables?
- Try to be specific about where and how you are going to measure it (remember the word replicable). Of course this is a short assignment, so do what you can.
- State what type of association you expect between the variables and why.

We'll begin collecting data after next week. You'll have a few weeks to gather the data. No, you may not work together on this project.

Due 11/23/2011

Your new wiki page must contain the following:

1. A scatterplot of your collected data (Use technology to create it and include the graph on your page)
2. The correlation coefficient between your explanatory and response variables. (Use technology to calculate it.)
3. An analysis of what you found.

Due 12/2/2011

4. Two constructive comments left on the project page of another student

Scoring Guide:

Category	40 points	20 points	10 points	0 points
Types of Variable Chosen	You chose two categorical variables		You did not chose appropriate variables for this project	You did not complete this project
Data Collection	You demonstrated that your collected and measured the data yourself		You used a list of data someone else collected	You did not complete this project
Calculations/Display of data	You correctly used technology to calculate and display your data	You had an error in either your calculations / Use of software, but the rest of your work is correct	You could not correctly work with your data.	You did not complete this project
Analysis of Results	You correctly related your results back to your initial mini-proposal. You suggested possible sources of confounding influences.		You did not correctly link your results back to your mini-proposal.	You did not complete this project.

**SPRING SEMESTER:  
STATISTICS GROUP ASSIGNMENT**

This is a simple project. Your goal as a group is to prove to the class and to me that you have learned something about statistics over the course of this semester. The simple way to do this is to develop a hypothesis, design a study, collect some data, analyze the data, present the data, and defend your results.

What you choose to study is up to you. Perhaps you are interested in the heights of children in different parts of town. Perhaps you are interested in the numbers of students on the honor rolls at various schools in the area. The subject matter is up to you, but alpha will equal .05.

Whatever you choose to examine in your study must be checked with me. Each of you will write an individual paper presenting your results. You will also use the computer/projector to present your data and results to the class. At a minimum, you are expected to:

- a) State the purpose of your study
- b) Define your population
- c) Explain how your sample(s) was(were) selected
- d) Justify your selection process as being unbiased and/or fair
- e) Explain how your data was collected.
- f) Present your data graphically.
- g) State and explain your choices for type of test(s).
- h) Perform test(s) and summarize your results
- i) Use one or more concepts from the book "How to Lie with Statistics" to explain to the class how you might come to the opposite conclusion.
- j) Explain and detail any problems that may compromise your results
- k) Answer questions from the class

Your grade will be determined as follows:

15% Peer Review of your presentation.\*

15% My review of your presentation.\*

70% Your paper, which will be due on June 8, 2011 barring Snow Days extending the School year \*

**While I do need an e-copy of your paper, it MUST be handed in on paper, in class to be considered on time!**

\*All points will be determined using the following grid:

Award points based on the truthfulness of the following statements.	Possible Points
I know the purpose of this study.	5
I understand how they defined the population the way that they did, and it made sense.	5

They explained that their sample(s) were chosen appropriately and in an unbiased and fair process (and they were right).		15
The data was presented graphically and effectively.		15
They explained the how and why they picked the appropriate test for their situation (and they were right).		10
Their test result(s) agreed with their conclusion.		5
They understood the ideas in "How to Lie with Statistics"		10
Any problems and issues in data collection and/or interpretation were identified and their relevance explained.		10
They answered our questions accurately and effectively.	The paper is well presented and organized.	10
The presentation is well presented and organized.	The Statistical analysis and calculations are correct and appropriate.	15
Total		100

Course # BMAT214

Prepared by: Daniel Lemay

Date: May 15, 2013

Approved by  
Department Chairperson:  
Date: