

STAT 216 Introduction to Statistics Spring 2016

Course Coordinator & Instructor:

	Office	Phone	e-mail - BEST WAY TO REACH ME!
Cindy Leary	Math 214	243-6712	cindy.leary@mso.umt.edu

Stat 216 on Moodle: All information for this course will be posted on Moodle. Here you will find all handouts given in class and all notes covered during lecture. This includes all lab worksheets, “hand-in” homework assignments, and the solutions to all assignments. The lecture notes have significant amounts of material intentionally omitted so that we may cover this material during class. If you miss a class, check Moodle for any announcements made that day, and copy the notes from a classmate. We will not provide you with copies of notes you missed. A course pack containing the blank notes is available in the bookstore.

Course Format: 3 lectures/week: MWF 9:10-10 or 10:10-11am, North Underground Lecture Hall (NULH 101).
1 discussion/lab section per week: Thursday at the times listed below.
Attendance at discussion sections is mandatory.

Prerequisite: M 115 (Probability and Linear Mathematics, previously labeled MATH 117)

STAT 216 Discussion Sections

9:10 lecture				10:10 lecture			
Section	Time	Room	Instructor	Section	Time	Room	Instructor
1	8:10	MA312	Denis Shchepakina	11	8:10	MA103	Zor Aliyev
2	9:10	MA312	Denis Shchepakina	12	9:10	MA103	Zor Aliyev
3	10:10	MA312	Ellie Bayat Mokhtari	13	10:10	MA103	Joyce Schlieter
4	11:10	MA312	Ellie Bayat Mokhtari	14	11:10	MA103	JonAlan Osborne
5	12:10	MA312	Quy Cao	15	12:10	MA103	JonAlan Osborne
6	1:10	MA312	Quy Cao	16	1:10	MA103	Erik Kappelman
7	2:10	MA312	Joyce Schlieter	17	2:10	MA103	Mike O’Lear
8	3:10	MA312	Joyce Schlieter	18	3:10	MA103	Mike O’Lear

STAT 216 Instructors: You may go to ANY of the instructors for help during their office hours (please see Moodle for up-to-date hours):

Name	Office	Phone	Email
Cindy Leary	Math 214	243-6712	cindy.leary@mso.umt.edu
Zor Aliyev	Corbin 357	243-5470	intizor.aliyev@umontana.edu
Ellie Bayat-Mokhtari	Corbin 369	243-4469	elham.bayatmokhtari@umontana.edu
Quy Cao	Corbin 367	243-4469	quy.cao@umontana.edu
Erik Kappelman	Corbin 256	243-2383	erik.kappelman@umontana.edu
Michael O’Lear	Math 212	360-1995	m.olear@mso.umt.edu
JonAlan Osborne	Corbin 356	243-4483	jonalan.osborne@umontana.edu
Joyce Schlieter	Corbin 266	243-2755	joyce.schlieter@umontana.edu
Denis Shchepakina	Corbin 361	243-4489	denis.shchepakina@umontana.edu

Learning Outcomes

Upon successful completion of STAT 216, a student will:

1. be able to describe and explore sets of data both numerically and graphically.
2. know how to use the normal model for the distribution of a single variable and the linear regression model for the relationship between two variables.
3. know the basic principles of good experimental design and good sampling design.
4. know the fundamental ideas of statistical inference for means and proportions including both hypothesis testing and confidence intervals.
5. be able to interpret confidence intervals and P-values in the context of real problems.
6. be a critical consumer of statistical studies reported in the media.

Computing Information: **StatCrunch** statistical software will be used by the instructor during class and will also be required for some homework problems throughout the course. This software can be accessed within MyStatLab. Instructions for using StatCrunch are given at the end of the chapters within the course notes when applicable.

REEF Polling or iclicker: REEF Polling is a cloud based learning and assessment system that we will use during the lecture portion of this course. REEF Polling is providing us with free access so do not pay the registration fee. You will need a wireless capable smartphone, tablet, laptop, or iclicker2. A traditional iclicker will also work most of the time, but you won't be able to submit occasional numeric answers with it. This technology allows me to assess your understanding of the material, make the course more engaging, and collect data for our class to analyze. Your responses will also constitute a portion of your grade (5%). Your REEF Polling grade will be partially based on attendance and partially based on correct responses. While these responses are worth 5% of your grade, you also have the option of using your overall exam average as your REEF Polling grade.

Textbook: Intro Stats (4th ed. Custom), by DeVeaux, Velleman, & Bock. Please note that this is a custom edition. It will most likely be cheaper to purchase this from the bookstore rather than buying the full edition from somewhere else. It is completely acceptable if you have the full edition or a used book from somewhere else, but you will still need to get access to MyStatLab. An online version of the textbook is provided within MyStatLab.

Calculators: Since Math 115 is a pre-requisite for this course, it is expected that you already own a calculator suitable for this class and that you also know how to use it. Your calculator should, among other things, be able to calculate probabilities from the Normal and t-distributions. All in class demonstrations will be done with a TI-83, TI-83 Plus, or TI-84 Plus. If you need to purchase a calculator, you would probably be most comfortable with one of the TI's just listed. A list of other calculators is provided on the Moodle course page. Please note that calculators with a QWERTY keyboard, smart watches, and cell phones are not allowed for use during exams.

Incomplete (I) Grades: Incompletes (I's) are given at the discretion of the course coordinator (Cindy Leary) only. See the 2015-2016 UM catalog for the conditions under which an "I" may be given.

Credit/No-Credit Grades: A D- grade is required to receive credit under the Credit/No-Credit option. You will be allowed to change your grading option from Credit/No Credit to Traditional or vice versa up until May 6th. **Note: A course taken to meet a general education requirement (such as Stat 216) CANNOT be taken as Credit/No Credit.** See the 2015-2016 UM catalog for more information.

Grading: Your overall percentage for the course will be computed using the weights to the right. I will also drop some of your lowest scores as indicated in the table. The +/- grading system will be used to assign final grades. There is no strict grading scale for this course; however, the table below indicates the worst-case scenario for the letter grade breakdown. For example, if you earn an 80% in the course, you are guaranteed no worse than a B-, and it could be higher. No extra credit will be available.

Grade Category	Weight	# Dropped
MyStatLab Homework	10%	2
Hand-in Homework	8%	1
Reef Polling (or Exam Avg)	5%	5 Days
Worksheet/Lab Grade	8%	1
Exam #1	23%	0
Exam #2	23%	0
Exam #3	23%	0

Grade	A- to A+	B- to B+	C- to C+	D- to D+	F	CR (Credit)
Percentage	90-100%	80-89%	68-79%	57-67%	Less than 57%	57-100%

“Hand-in” Homework: Weekly assignments will be posted on Moodle as a word document. It is expected that you **type** the answers into this document or **neatly** write in your work when appropriate. This course largely focuses on teaching you how to interpret and analyze data. We expect you to use **correct grammar and spelling** while providing **clear and concise** explanations. These assignments will be handed in at the **beginning** of your lab on Thursdays. **LATE HOMEWORK WILL NOT BE ACCEPTED FOR ANY REASON.** We will not regularly accept homework assignments via e-mail, but you may e-mail an assignment if you are sick and cannot make it to campus. Homework is not only a fairly substantial portion of your grade, but it is vital to your success in this class. Working with other students on homework is allowed and encouraged, as long as you **hand in your own work**, and do not simply copy someone else’s work. Solutions to all problems from each assignment will be posted on Moodle.

MyStatLab Homework: You will also be expected to complete online homework assignments through MyStatLab. You should access MyStatLab through <http://pearsonmylabandmastering.com/>. You will need the access code that came with your textbook and the courseID (umstat50154). **When registering for MyStatLab please use your name as it appears on Cyberbear.** Any assignments completed after the due date will only receive 50% of the points earned.

Recommended Problems: Additional recommended problems will be assigned but not collected from each chapter, with answers provided in the textbook. You are **STRONGLY** encouraged to work all of these problems. Solutions to homework and worksheets will also be posted on Moodle.

Labs/Worksheets: During the discussion sections, you will have the opportunity to ask questions about course material and work on problems with other students in small groups. You will complete a worksheet most weeks during the discussion section. The intent of the worksheets is to have you practice using statistical methods and to promote cooperative learning. Completing the worksheets in groups will allow you to discuss ideas and problems with other students. Your worksheet grade will reflect both your own work and the work of your group. ***** Make-up worksheets will not be given for any reason.**

Test	Date	Time
Test #1	Thursday, March 3rd	6:00-7:30pm
Test #2	Thursday, March 31st	6:00-7:30pm

Tests: There will be 2 **evening** tests during the semester given in NULH and Urey lecture halls.

You **must** take the test in your assigned location and time. More will be said about the exams at a later date. If you cannot make it to an exam, you must let us know **BEFORE** the exam is given. No make-up exams will be given without a documentable reason for missing the exam.

Final exam: The final exam will emphasize later material but will also cover some of the key elements from earlier chapters. The final exam place and time will be announced in lecture, but is tentatively planned for 5:30-7:30pm on Wednesday, May 11th in the North Underground and Urey lecture halls. In any case, please plan on taking the final exam on **Wednesday evening** of finals week. Makeup exams will not be given due to travel plans.

Study Advice: COME TO CLASS! STUDY THE NOTES! BE AN ACTIVE LEARNER! Read through the notes to be covered **before** coming to class and review them after class. Either print the notes from Moodle or purchase a course pack from the bookstore. This will reduce the volume of notes you will need to take in class and you will get more out of the lecture. Read the textbook to solidify your understanding of the topics introduced during lecture. Doing your homework as well as the additional recommended problems **conscientiously** will greatly increase your chance of success in this class. There will be **STUDY JAM** sessions held most Monday and Wednesday evenings in the U.C. commons (6:30pm-9:00pm). ****Plan to spend 2 hours outside of class for each hour of class****

Adding/Dropping the Course: February 12th is the deadline for students to drop or change a grading option via CyberBear. After this date, a student is allowed to make changes **only by petition**. I will sign petitions to change your grading option to credit/no credit up until May 6th, but I will not sign a drop slip after the **March 28th deadline** unless there are extenuating circumstances. The final deadline for any and all changes is May 6th. These policies are listed in the UM catalog at <http://www.umt.edu/catalog>.

Students with disabilities: Students with disabilities may request reasonable modifications by contacting me (Cindy Leary). The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). “Reasonable” means the University permits no fundamental alterations of academic standards or retroactive modifications. For more information, please consult <http://www.umt.edu/disability>.

Academic Misconduct: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. This includes, but is not limited to, copying answers on homework assignments, cheating on exams, and any type of dishonesty in your work.

All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://www.umt.edu/vpsa/policies/student_conduct.php.

Date	Day	Chapter	Topics Covered (Tentative!!)
1/25	Monday	1	Course Introduction, Data
1/27	Wednesday	1,2	Categorical Data, StatCrunch demo
1/29	Friday	2	Categorical Data Displays & Distributions
2/1	Monday	2,3	Displaying & Describing Quantitative Variables
2/3	Wednesday	3	More Displaying & Describing Quantitative Variables
2/5	Friday	3	Mean and Standard Deviation
2/8	Monday	4	Comparing Distributions, Boxplots
2/10	Wednesday	4	Comparing Distributions, Boxplots
2/12	Friday	5	z-scores
2/15	Monday	5	President's Day - No Class
2/17	Wednesday	5	Normal Model and the Empirical Rule
2/19	Friday	5,6	More on Normal Models, Scatterplots
2/22	Monday	6	Correlation
2/24	Wednesday	7	Linear Regression, Residual Analysis, & R^2
2/26	Friday	8	Regression Wisdom: Outliers, Influential Points
2/29	Monday	8	Transformations in Regression
3/2	Wednesday	7,8	Regression Examples
3/3	Thursday		EXAM from 6:00pm to 7:30pm
3/7	Monday	9	Randomness & Simulation
3/9	Wednesday	10	Sample Surveys, Simple Random Samples
3/11	Friday	10	Other Sampling Designs
3/14	Monday	11	Observational Studies, Experimental Designs
3/16	Wednesday	11	More on Experimental Designs
3/18	Friday	12	Randomness & Probability, Law of Large Numbers
3/21	Monday	15 (Skip 13,14)	Sampling Distribution of \hat{p}
3/23	Wednesday	15	Central Limit Theorem (CLT) for \hat{p}
3/25	Friday	16	Confidence interval for p
3/28	Monday	16	Confidence interval for p
3/30	Wednesday	17	Hypothesis testing introduction
3/31	Thursday		EXAM from 6:00pm to 7:30pm
4/4 to 4/8			Spring Break
4/11	Monday	17	Hypothesis Testing for p
4/13	Wednesday	17	Hypothesis Testing for p , P-values
4/15	Friday	15	Central Limit Theorem (CLT) for \bar{y}
4/18	Monday	18	Inferences about means, t-procedures
4/20	Wednesday	18	Inferences about means, t-procedures
4/22	Friday	19	Statistical vs Practical Significance
4/25	Monday	19	More about tests, P-values, Type I & Type II errors
4/27	Wednesday	20	Comparing two proportions
4/29	Friday	20	Comparing two proportions
5/2	Monday	20	Comparing two means
5/4	Wednesday	20, 21	Comparing two means & Paired Data
5/6	Friday		Putting all inference procedures together with examples
5/11	Wednesday		FINAL EXAM from 6:00pm to 8:00pm