Northern Michigan University
Mathematics and Computer Science Department
Introduction to Probability and Statistics (4 credits)
MA109-03 (81558) MW 4:00 – 5:40pm MCLIN 106

Instructor: Chad E. Leisenring **Office:** JAMR 2209
Email: cleisenr@nmu.edu **Office Hours:** T 4-6pm, R 4-6pm

Prerequisite
MA100 (passed with a C- or better) or satisfactory score on the Mathematics Placement Exam.

Course Description:
The study of descriptive and inferential statistics, with an emphasis on hypothesis testing and an introduction to linear regression and ANOVA in a statistical package such as R.

Text and Other Requirements:
- Text: *The Basic Practice of Statistics*, 8th edition; Moore, Notz, and Fligner. W.H. Freeman: Macmillan Learning. (**e-book** or hard copy)
- SaplingPlus – access to e-book, online homework, multimedia, and StatsTools.
- Download R at https://www.r-project.org.
- A scientific or graphing calculator may be useful to aid in working some of the problems. You may not use a CAS graphing calculator – they are too strong.

STUDENT INSTRUCTIONS FOR SAPLING
(I copied these instructions. Please let me know if they aren't working)
1. Click on this link to access Sapling Learning: https://www.saplinglearning.com/ibiscms/login/
2. Click "Create Account" to begin creating your Sapling account.
3. Fill out your information using your @nmu.edu email, and when prompted to, verify your email with Sapling.
4. After email verification, log in to your account and select "Northern Michigan University" as your Institution and "Introduction to Statistics", "Quarter 1", and then go select our section "Northern Michigan University – MA109.03 – Fall20 – Liesenring"
5. Either enter your Sapling Access Code purchased online / from the Bookstore, or purchase Sapling access now. You will have 14 days as a free trial to begin the semester.
6. You are now enrolled in the course and can access future assignments.
7. **To access your e-book**, click on the image of the cover on the right sidebar of your course site. Create an account or log in with an existing Macmillan Learning eBook account.
8. **Need Help?** Answers to many common questions are found in our Student Support Community. If you need direct assistance, you can also contact technical support: https://macmillan.force.com/macmillanlearning/s/.

Learning Outcomes:
1. Read, use, and interpret correct vocabularies of probability and statistics.

2. Apply basic principles of data collection to observational study and experimental design. This may include (but is not limited to) topics such as randomness, sampling error, sampling techniques, bias, blinding, and types of data.
3. Summarize, present, and interpret data graphically and numerically. This may include (but are not limited to): frequency distributions, pie charts, boxplots, stem plots, histogram, measures of central tendency, and measures of dispersions.
4. Perform basic probability computations. These include (but are not limited to): the addition rule, the multiplication rule for independent events, and the complement rule.
5. Solve problems by applying appropriate probability distributions, which may include (but are not limited to) discrete, binomial, and normal probability distributions.
6. Use the Central Limit Theorem to model sampling distributions and compute probabilities based on sampling distributions.
7. Construct and interpret confidence intervals of proportion or mean for one population.
8. Construct and interpret confidence intervals for the difference of proportions or means for two populations.
9. Formulate and test hypotheses about parameters for both one and two populations for both n means and proportions
10. Analyze bivariate data. This includes (but is not limited to) generating and interpreting scatter plots, line of best fit or ANOVA as appropriate, and the related r and r^2 values.
11. Interpret and apply output from a statistical software package, such as R.

Learning outcomes will be assessed using assignments and tests.

Assessment Format: Specific information on each assessment is below.

- **Online Learning and Work (24%):** Online work is split into two parts: completing your StatTutor assignments each week (12%), and completing your homework assignments each week (12%) Homework is online, but I am always happy to answer questions about it. There will also be quizzes tossed into the homework grade. I typically use my exams as a "gut check" to see how you are with the material before its exam time. Be sure to write down the question along with all your work done in completing the problems – this helps me see where you're at and can help you easier!
- **Attendance / Participation (10%):** You get (5%) of these points for coming to class and the other (5%) for completing each week's Learning Curve on Sapling. We meet twice a week rather than four times a week, so attendance is even more important than usual! We will work examples together so you can ask questions and learn R.
- **Exams (36%, 3 total):** Each test will consist of questions from the material discussed in class. A university-approved excuse is generally a prerequisite for rescheduling any test.
- **Final Exam (30%):** The final exam is cumulative. You must score above a 60% on your final exam to receive a passing grade for the exam.

Grading Scale (%): Your course grade will be weighted according to the percentages outlined under Assessment Format. Corresponding grades based on a percentage are below.

100 – 91%	A
89 – 81%	B
79 – 71%	C
69 – 61%	D
59 – 0%	F

How do I get help in the class?

1. See me during office hours or set up an appointment.
2. Go to the Math Tutoring Lab in Jamrich 2100 (M-F 9:00 am – 6:00 pm). See EduCat for their schedule. Certain tutors have more experience in certain courses.
3. Go to All Campus Tutoring (generally available on the weekends). Check their walk-in tutoring schedule at https://www.nmu.edu/tutoring/.

University Policies

NMU's Non-Discrimination Statement:
Northern Michigan University does not unlawfully discriminate on the basis of race, color, religion, sex, national origin, age, height, weight, marital status, familial status, handicap/disability, sexual orientation, or veteran status in employment or the provision of services, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities.

Anyone having civil rights inquiries may contact the Equal Opportunity Office, 502 Cohodas Hall, telephone number 906-227-2420.

ADA Statement:
If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Dean of Students Office at 2001 C. B. Hedgcock Building (227-1737 or disserv@nmu.edu). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.

Mask Accommodation ADA Statement:
Certain students may qualify for alternative face-covering accommodations due to a variety of health conditions. These students have gone through a qualifying process with the Office of Disability Services. Faculty have been notified of which students receive these accommodations in their class. If you have concerns regarding this topic please contact the faculty member outside of class. Please do not question or confront fellow students in the classroom who are using alternative or modified face coverings.

** This Syllabus is subject to change with notice*