

DATA109: Introduction to Statistics

Course Instructor: Skylar Korf

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Office Hours: 2pm - 4pm, MW

Office: Jamrich 2234

Web: educat.nmu.edu

Class Hours: MTWR 4pm-4:50pm

Class Room: The Science Building (TSB) 3801

Prerequisites

Prerequisites: MA 100

Learning Outcomes

NMU General Education Learning Outcomes for Quantitative Reasoning and Analysis (QUAR)
Students will demonstrate:

- Critical thinking
- Interpretation of quantitative data leading to conclusions

Course Objectives

This class assumes no prior instruction of probability or statistics, or a working knowledge of R programming, and serves to achieve the following outcomes:

1. Read, use, and interpret correct vocabularies of probability and statistics.
2. Apply basic principles of data collection to observational studies and experimental design, including topics such as randomness, sampling error, sampling techniques, bias, 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, and measures of central tendency.
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 means or proportions for one population, and for the difference of means or proportions for two populations.
8. Formulate and test hypotheses about parameters for both one and two populations for both n means and proportions
9. 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.
10. Interpret and apply output from a statistical software package, such as R.

Course Materials

This course will be utilizing the Achieve website provided by Macmillan for the textbook, online homework and other supplementary learning materials. When you go to educat.nmu.edu, you will need to click on the topic titled **Student Registration - Start Here**, under the 'Resources & Links' tab, and you should be prompted to log in with your NMU account and password.

You will also need to download the statistical software you will be using for homework, quizzes, and exams. First, go to <https://posit.co/download/rstudio-desktop/> and download and install R (this is the programming language), then you will download and install either Positron or RStudio (the software where we will be coding in R). Think of R as the engine providing all the horsepower for your calculations. The steering wheel and pedals that you will directly use are in Positron/RStudio, which is the program we will be doing much of our work in.

Online Homework

Online homework for this class will be comprised of standard homework assignments and Learning Curve assignments, both in Achieve. Homework will be due on Sundays, with the material in the homework being covered in class that week. By having the homework due on Sundays, this allows you to get help in office hours, the Math Lab, and in class in the days leading up to the homework being due. Homeworks will be made available in the weeks prior to them being due to allow you to work ahead, should you elect to.

Grading Policy

Overall course grade:

90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
0 - 59%	F

Grade breakdown:

Final	30%
4 Exams	40%
Homework	20%
Quizzes	5%
Participation	5%

Suggestions

Learning is an active process composed of struggles and mistakes until you finally understand the concept. Since learning requires this trial and error process, it is best to work together and help each other learn. Not only do you have your classmates, but you have time to ask questions in class (and don't be afraid to ask!), my office hours, and the free tutoring services on campus (the Math Department's Math Lab in Jamrich 2100, and NMU's All-Campus Tutoring in Harden Hall and the Woods). I encourage you take advantage of **all** of the resources at your disposal!

Aside from using your resources, it is important that you attend class and be mentally present, ask and answer questions, and be engaged in the activities. There is a direct relationship with effort and academic success, so use your resources to help translate your effort into the grade you want.

Accessibility

If you have a need for disability-related accommodations or services, please inform the Coordinators of Disability Services in the Dean of Students Office at 2001 C. B. Hedgcock Building (906-227-1737 or disability@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.

Note on Flexibility

- Homework: All homework for this course is online. The typical homework assignments are taken care of by the Macmillan portal.
- Exams: All exams will be in person unless special exception is needed, please let me know well in advance.
- Attendance: All class lectures will be in-person at our allotted time. PowerPoint slides are made available at the beginning of the sections.

Final Disclaimer

I reserve the right to alter the policies and contents of this syllabus upon adequate notification of you, the student.