Introduction to Probability and Statistics (4 credits)
MA109-06 (82273) MWRF 12:00 – 12:50pm JXJ 2317
MA109-07 (82274) MWRF 1:00 – 1:50pm JXJ 2317

Instructor: Dr. Carol Bell
Office: JXJ 2212
Office Phone: (906) 227-1603
email: cbell@nmu.edu
Office Hours: MWRF 11:00 – 12:00, 2:00 – 3:00, or by appointment

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 resources, and
  StatsTools.
• Download R at [https://www.r-project.org](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.

STUDENT INSTRUCTIONS FOR SAPLING
1. Find the Sapling Learning content section on your instructor’s course page in
   EduCat.
2. Click on the first link to see instructions on setting up your Sapling account.
3. Click on the second link to see instructions on registering for the Sapling course.
4. You are now enrolled in the course and can access future assignments.
5. To access your ebook, 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.
6. 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/](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 Homework (20%)**: Homework is online. You should keep a homework journal of your written work so that you can ask questions on the problems you do not understand. Be sure to write down the question along with all your work done in completing the problems.
- **Attendance/Participation (10%)**: Read each section, watch the videos, and do the corresponding problems (StatTutor) prior to class. I will not be spending time lecturing on the material. Instead, we will work examples together so you can ask questions and learn R. You will then spend time doing problems in class so you can work with classmates and solidify your knowledge of the concepts.
- **Tests (50%)**: Each test will consist of questions from the material discussed in class. A university-approved excuse is generally a prerequisite for rescheduling any test. **Make-up tests are not given**. If you miss a test, half of your raw score on the final exam will replace the missed test. Additional tests missed are scored as 0.
- **Final Exam (20%)**: The final exam is cumulative. Below are the dates of the final exam.
  - 12:00 Class: **Tuesday, December 10, 12:00 – 1:50pm**
  - 1:00 Class: **Thursday, December 12, 12:00 – 1:50pm**
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 – 95.0: A
- 94.9 – 89.5: A-
- 89.4 – 86.5: B+
- 86.4 – 82.5: B
- 82.4 – 79.5: B-
- 79.4 – 76.5: C+
- 76.4 – 72.5: C
- 72.4 – 69.5: C-
- 69.4 – 66.5: D+
- 66.4 – 62.5: D
- 62.4 – 59.5: D-
- 59.4 – 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 – 5:00).
3) Go to All Campus Tutoring (generally available on the weekends). Check their walk-in tutoring schedule at https://www.nmu.edu/tutoring/.

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.

Important Deadlines:

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