MAT 130 – PROBABILITY AND STATISTICS   1/2020
4 hrs./wk. – 4 cr.   BEGINNING SRING 2020

Catalog Description: The fundamental principles of statistical methods. Descriptive statistics, correlation, regression, probability, binomial and normal distributions, sampling, hypothesis testing, confidence intervals and ethical issues in statistics are included. An introduction to the use of statistical software to analyze data will be emphasized.

Prerequisite: MAT 016 or MAT 060 or MAT120 or equivalent.

Text: Weiss, Neil, *Introductory Statistics,*10th ed. (Pearson).

Supplementary Materials: *Student's Solutions Manual* (Pearson)

Syllabus

Suggested Timeline	Text Chapter	Topics
		See attached notes regarding ethical reasoning and information literacy topics.
1	1.1 – 4	Overview; types of data, sampling techniques
2 – 3	2.1 – 5	Organization and presentation of quantitative and qualitative data, distribution shapes and misleading graphs
4-6	3.1 – 5	Measures of central tendency, measures of variation, Standard scores, percentiles, quartiles, outliers, 5-number summaries, box plots
7		Statistical technology (Minitab, Excel, R, graphing calculators, other)
8		**Test 1**
9 – 12	14.1 – 4	Descriptive methods in correlation and regression, Regression Identity
13-15	4.1 – 4.6, 4.8	Fundamentals of probability, Contingency Tables, Conditional Probability, Multiplication Rule, Counting Rules
16-18	5.1 – 3	Discrete random variables, probability distributions, Binomial distribution
20		Statistical technology (Minitab, Excel, R, graphing calculators, other)
21		**Test 2**
22- 24	6.1 – 4	Normal distribution, Assessing Normality
25	7.1 – 3	Sampling distributions of the mean; central limit theorem
26-28	8.1 – 3	Confidence interval for the mean (σ is known and unknown), margin of error
29		Statistical technology (Minitab, Excel, R, graphing calculators, other)
30		**Test 3**
31-34	9.1 – 9.5	Hypothesis tests for population mean (σ is known and unknown), P-values
35-38	12.1 – 12.2	Confidence Interval One Population Proportion, Hypothesis test for One Population Proportion
39-44		Statistical technology (Minitab, Excel, R, graphing calculators, Tableau, other) Technology Project (mandatory) / Presentation of Technology Project (optional)
45		**Final Exam**

Students are expected to adhere to the policies of the County College of Morris. These can be accessed at www.ccm.edu/academics/academic-policies/

Statement of Course LEARNING OUTCOMES

- **Distinguish** among different methods of random sampling used for data collection

- **Compute** measures of descriptive statistics

- **Construct** confidence intervals for the mean and interpret the results

- **Conduct** hypothesis tests for the mean and interpret the results when σ is known and unknown

- **Conduct** hypothesis test and confidence intervals for proportions

- **Construct and Derive** least-squares linear regression equations

- **Compute** binomial probabilities

- **Recognize** statistics presented in a misleading manner

- **Analyze and portray** statistical information in an ethical way

- **Evaluate and think critically** about statistical information and be able to use the information effectively

- **Use** technology and statistical software to **explore** and **analyze** data

- **Use** technology and statistical software to **construct** visual representations of data

- **Use** multimedia materials to teach and test students statistical knowledge and skills