COUNTY COLLEGE OF MORRIS
Course Information Outline

Course Title Probability and Statistics **PREFIX&NUMBER** MAT 130

Lecture Hours 60 **Laboratory Hours** 0 **Credit Hours** 4 **Course Fee** 0

Department Chairperson Approval Alexis Thurman A. Thurman **Date** 4/10/14

Division Dean Approval Patrick Enright **Date** 4.11.14

General Education Information:

Categories:

☐ Communications ☐ History ☐ Humanities ☒ Mathematics
☐ Science ☐ Social Science ☐ Technological Competency
☐ Diversity *(check if course also meets diversity category)*

Integrated Goals: *(check all that apply)*

☐ Ethical Reasoning and Action ☐ Information Literacy

1. **Catalog Course Description**

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

2. **Prerequisite(s)**

   MAT 016 or MAT 060 or MAT 120 or equivalent.

3. **Co-requisite(s)**

   None

4. **Textbooks**

   Weiss, *Introductory Statistics*, 9th ed. (Addison-Wesley)

5. **Supplementary Books and/or Materials**

   Supplementary materials: Students' Solutions Manual to accompany Weiss' *Introductory Statistics*, 9th ed.
   Technology Resource Information Card (optional):
   Minitab: ISBN-13: 978-0-321-59282-8 R: ISBN-13: 978-0-321-59283-5

6. **Specialized equipment, supplies, facilities, for classes limited by enrollment or restricted by accreditation and/or equipment limitations.** (Information will be used to determine differential funding category.)

   None

7. Course Content (List of Topics)

- Overview; types of data, sampling techniques
- Organization and presentation of quantitative and qualitative data
- Distribution shapes and misleading graphs
- Measures of central tendency
- Measures of variation, standard scores, percentiles, quartiles, outliers
- 5-number summaries and Box Plots
- Descriptive methods in correlation and regression, Regression Identity
- Fundamentals of probability, Contingency Tables
- Conditional Probability, Multiplication Rule, Counting Rules
- Discrete random variables, probability distribution, Binomial distribution
- Normal distribution, Assessing Normality
- Sampling distributions of the mean; central limit theorem
- Confidence interval for the mean (σ is known and unknown), margin of error
- Hypothesis tests for population mean (σ is known and unknown), P-values
- Confidence Interval One Population Proportion, Hypothesis test for One Population Proportion

- Statistical technology (Minitab, Excel, R, Graphing Calculators, other)
- Technology Project (mandatory) / Presentation of Technology Project (optional)

8. 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

9. Statement of Relation to Curriculum(s)

Probability and Statistics is an optional course in Business Administration and other programs.

10. Format for offering the course (check all that apply)

☒ **Traditional** ☒ **On-Line** ☒ **Hybrid**