COUNTY COLLEGE OF MORRIS
Course Information Outline

Course Title__Probability and Statistics II____ PREFIX&NUMBER____MAT 210____

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**

   This course is a continuation of statistical analysis from Probability and Statistics. Techniques for collection and analysis of data, emphasizing estimation and hypothesis testing, analysis of variance and regression analysis are included. Also included are nonparametric testing and an introduction to multiple regression. A focus on analyzing large data sets using statistical software.

2. **Prerequisite(s)**

   MAT 124, MAT 130 or MAT 183 (grade "C" or better) 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.
   R Study Card: ISBN-13: -78-0-321-59283-5   ISBN-10: 0-321-59283-2

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)

- Review of the normal curve and sampling distributions, Assessing Normality
- Confidence intervals for one population mean when σ is known and unknown
- Introduction – Hypothesis test
- Hypothesis tests for one population mean when σ is known and unknown, Students' t-distribution; P-values
- Nonparametric Methods – Wilcoxon Signed-Rank Test – symmetric distribution but not normal
- Type II Error of Probability

- Sampling distribution for the difference between two sample means for independent samples
- Inference for two population means using independent samples (σ assumed equal, σ assumed not equal)
- Mann-Whitney Nonparametric Test / Wilcoxon Rank and SumTest – non-normal but the distribution is same shape
- Inference for two population means, using paired samples
- Paired Wilcoxon Sign Rank Test

- Inferences for one population standard deviation
- Inferences for two population standard deviations, using independent samples
- Confidence intervals for one population proportions, hypothesis test for one population proportion
- Inferences for two population proportions, using independent samples·
- Chi-Square distribution; Goodness-of-it
- Contingency tables, association; Chi-Square Independence Test

- Descriptive methods in regression and correlation
- Regression model, analysis of residuals
- Inferences for the slope of the population regression line
- Estimation and prediction, multiple regression, Correlation Matrix
- Inference in correlation, testing for normality
- F-distribution, ANOVA
- Statistical Technology

8.   Statement of Course LEARNING OUTCOMES

- **Create** confidence intervals for several statistical parameters (μ, σ and proportions)
- **Perform** several hypothesis tests for several statistical parameters (μ, σ and proportions)
- **Perform** non-parametric test for several statistical parameters
- **Perform** goodness of fit test and testing for normality
- **Analyze** a correlation matrix and an ANOVA table

- **Create and interpret** the t-distribution
- **Create and interpret** a Chi-Square distribution
- **Create and interpret** the F-distribution

- **Construct and derive** the multiple least-squares linear regression equation

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9. **Statement of Relation to Curriculum(s)**

Probability and Statistics II is an optional mathematics course in any program.

10. **Format for offering the course (check all that apply)**
    ☒ Traditional   ☒ On-Line   ☒ Hybrid