I. RATIONALE:

A statistical analysis is essential to modern management in criminal justice and to the development of modern criminological theory in Sociology. You will need to evaluate current research, local trends and local program performance. This course will begin to equip you with the tools you will need.

II. MAJOR INSTRUCTIONAL GOALS:

GOAL A:
The student will develop an understanding of the fundamental concepts that will provide them with the tools necessary to address routine statistical analyses.

Learning Outcomes: The student will:

A-1 Analyze and discuss basic numerical summaries of data (Central Tendency measures, Variation or Variability measures and Relative standing measures).
A-2 Analyze and discuss basic graphical summaries of data (Univariate and Multivariate).
A-3 Develop an understanding of the R statistical programming language.

GOAL B:
The student will be able to develop a professional position on the utility and limitations of statistical research.

Learning Outcomes: The student will:

B-1 Analyze and discuss the history of the null hypothesis significance testing paradigm in the social sciences.
B-2 Discuss alternative techniques to convey effectively the importance of data-analytic findings.
B-3 Compare and contrast the limitations and the benefits of using statistical methods.
GOAL C:
Students will be able to develop an understanding of the recent developments and debates regarding researching with integrity and ethically and complying with ethical requirements.

**Learning Outcomes:** The student will:

- C-1 Demonstrate an understanding of the practical value of thinking seriously and systematically about ethical conduct in social science research.
- C-2 Examine and discuss the ethical issues regarding the reporting of results (misrepresentation of findings, misrepresentation of credit, and failure to report results as a result of self-censoring or external censoring).
- C-3 Examine and discuss the ethical issues of conducting research (design, recruitment, causism, scientific quality, costs and utilities).
- C-4 Examine and discuss the ethical issues of data analysis (data dropping, data exploitation and meta-analysis).

GOAL D:
The student will be able to utilize a decision tree to select the appropriate statistical test for a given statistical task

**Learning Outcomes:** The student will

- D-1 Examine and discuss how continuous variables and categorical variables can impact the selection of the correct statistical test.
- D-2 Develop an understanding of the six inferential statistical techniques commonly used in criminal justice research and practice (t-test, Analysis of variance –ANOVA, Chi square, Pearson r, Spearman rho and Multiple regression).
- D-3 Perform a Decision Tree exercise to assist with the proper selection of a statistical test to analyze data

GOAL E:
The student will be able to develop an understanding of how and why bivariate inferential statistics are used in social science research.

**Learning Outcomes:** The student will

- E-1 Devise a useable survey instrument with a coding strategy and analyze the data.
- E-2 Calculate a simple 2 factor correlation (Pearson and Spearman).
- E-3 Calculate a simple 2 group comparison (Gossett’s Student T-Test).
- E-4 Calculate a simple chi square (Observed and Expected).
- E-5 Interpret computer output from ANOVA and Regression.