I. ASCRC General Education Form

<table>
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<tr>
<th>Group</th>
<th>III Symbolic Systems</th>
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<tbody>
<tr>
<td>Dept/Program</td>
<td>Mathematical Sciences</td>
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<tr>
<td>Course #</td>
<td>444</td>
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<tr>
<td>Course Title</td>
<td>Statistical Methods</td>
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<tr>
<td>Prerequisite</td>
<td>Math 117 or C/I</td>
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<td>Credits</td>
<td>3</td>
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II. Endorsement/Approvals

Complete the form and obtain signatures before submitting to Faculty Senate Office

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<tr>
<th>Please type / print name</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Instructor</td>
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<td>Phone / Email</td>
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<tr>
<td>Program Chair</td>
<td>Dave Patterson</td>
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<tr>
<td>Dean</td>
<td>Gerald A. Fetz</td>
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III. Description and purpose of the course: General Education courses must be introductory and foundational. They must emphasize breadth, context, and connectedness; and relate course content to students’ future lives: See Preamble: http://www.umt.edu/facultysenate/gened/GEPreamble_final.htm

IV. Criteria: Briefly explain how this course meets the criteria for the group. See: http://www.umt.edu/facultysenate/ASCRCx/Adocuments/GE_Criteria5-1-08.htm

1. rigorously present a mapping between a real-world system and a human abstraction of the system. Uses probability models (discrete and continuous) to model real-world random phenomena including data collection by random samples.

2. applies analysis, reasoning and creative thinking in the understanding and manipulation of symbolic codes. Uses various models and statistical tests for one- and two-sample problems and regression to analyze data and make inferences.

3. utilizes alternative methods of communication, perception, and expression in order to encourage rigorous thinking. Uses graphical and numerical summaries to present and summarize data. Emphasizes written interpretation and communication of statistical results in the context of the real-world problem.

V. Student Learning Goals: Briefly explain how this course will meet the applicable learning goals. See: http://www.umt.edu/facultysenate/ASCRCx/Adocuments/GE_Criteria5-1-08.htm

1. demonstrate an understanding of the symbols and the transformations of the system. (refer to attached learning goals) Goals 2,5

2. relay and interpret information in terms of the given symbolic system. Goals 1,4

3. apply creative thinking using the symbolic system in order to solve problems and communicate ideas. Goals 3,6
Course: MATH 444  
Title: Statistical Methods  
Date revised: December 6, 2005

I. Purpose of the course: To introduce statistical methods in an applied setting to students conducting research in other fields. This is a service course primarily for graduate students in the life sciences, physical sciences, or social sciences.

II. Course description: The current catalog description is given below.

*Intended primarily for non-mathematics majors who will be analyzing data. Graphical and numerical summaries of data, elementary sampling, designing experiments, probability as a model for random phenomena and as a tool for making statistical inferences, random variables, basic ideas of inference and hypothesis testing. Prerequisite: one year of college mathematics including Math 117 or equivalent course in probability or consent of instructor.*

III. Credit Hours: 3

IV. Frequency of Offering: Every autumn

V. Audience: Primarily graduate students in the life sciences, physical sciences, and social sciences. Some undergraduate mathematics or sciences majors also take the course.

VI. Learning Goals:
1. To learn how to describe and explore sets of data both numerically and graphically.
2. To learn about the normal, binomial, and other basic models for the distribution of a single variable and the linear regression model for the relationship between two variables.
3. To learn the basic ideas of good experimental design and good sampling design.
4. To understand some basic probability theory, and the importance of the normal distribution and Central Limit Theorem to statistical inference.
5. To learn the fundamental ideas of statistical inference for means and proportions including both hypothesis testing and confidence intervals.
6. To learn how to critically evaluate scientific journal articles with respect to the material learned in this class.

VII. Typical Methods of Course Assessment: EX(IC), HW, PR

VIII. Course Format: 3 weekly lectures with occasional use of statistical software such as SPSS.

IX. Use of Technology (if any): SPSS used for homework assignments. This course is generally taken concurrently with Math 447, which meets once a week and is intended as the computing portion of the course.