Course Syllabus
Online PBIS MATH 109-Fall 2013
Introduction to Statistics

Description:
A study of topics which includes descriptive statistics and data analysis, elementary probability, binomial and normal probability distributions, the Central Limit Theorem, confidence intervals, elementary hypothesis testing, linear regression and correlation. A major goal of this course is an application of these topics to problems arising from the natural sciences, the social sciences, the health industry, and the business environment.

Learning Outcomes
Upon successful completion of this course, the student will be able to
• use analytical skills to research, interpret, and evaluate statistical data.
• perform basic calculations involving probability and statistics.
• use appropriate language specific to statistics.
• employ and interpret statistical graphs.
• use logical and analytical thought processes to solve complex problems involving interpretation, evaluation, analysis and inference.
• demonstrate the ability to solve real-life applications of probability and statistics.

Course Outline:
Chapter 1: Introduction to Statistics
  1-1: Review and Preview
  1-2: Statistical Thinking
  1-3: Types of Data
  1-4: Critical Thinking
  1-5: Collecting Sample Data

Chapter 2: Summarizing and Graphing Data
  2-1: Review and Preview
  2-2: Frequency Distributions
  2-3: Histograms
  2-4: Statistical Graphics
  2-5: Critical thinking: Bad Graphs

Chapter 3: Statistics for Describing, Exploring, and Comparing Data
  3-1: Review and Preview
  3-2: Measures of Center
  3-3: Measures of Variation
  3-4: Measures of Relative Standing and Boxplots

Chapter 4: Probability
  4-1: Review and Preview
  4-2: Basic Concepts of Probability
  4-3: Addition Rule

Chapter 5: Discrete Probability Distributions
  5-1: Review and Preview
  5-2: Random Variables
  5-3: Binomial Probability Distributions

MIDTERM (Proctored): chapters 1 - 5
Chapter 6: Normal Probability Distributions
6-1: Review and Preview
6-2: The Standard Normal Distribution
6-3: Applications of Normal Distributions
6-4: Sampling Distributions and Estimators
6-5: The Central Limit Theorem

Chapter 7: Estimates and Sample Sizes
7-1: Review and Preview
7-2: Estimating a Population Proportion
7-3: Estimating a Population Mean: \( \sigma \) known
7-4: Estimating a Population Mean: \( \sigma \) Not known

Chapter 8: Hypothesis Testing
8-1: Review and Preview
8-2: Basics of Hypothesis Testing
8-3: Testing a Claim about a Proportion
8-4: Testing a Claim about a Mean: \( \sigma \) known
8-5: Testing a Claim about a Mean: \( \sigma \) Not known

Chapter 9: Inferences from Two Samples
9-1: Review and Preview
9-2: Inferences about Two Proportions
9-3: Inferences about Two Means: Independent samples

Chapter 10: Correlation and Regression
10-1: Review and Preview
10-2: Correlation
10-3: Regression

FINAL EXAM (Proctored): chapters 6 – 10

Course Materials:
- Text \( \text{(optional)} \): Triola, Mario F. *Elementary Statistics with TI-83/84 Calculator*. Addison Wesley.
  - Textbook ISBN-10: 0321641485
This comes with the access code for My Stat Lab, so do not purchase separately.
- My Stat Lab \( \text{(REQUIRED)} \): a complete online multimedia resource to help you succeed in learning, including online access to the textbook above. The access code should come with the textbook or you can purchase it as a standalone copy: ISBN 0-321-19991-X. If you do not have a student registration code, you can purchase online access to http://pearsonmylabandmastering.com/ using a credit card and your instructor's course ID (see below).
- Scientific calculator \text{required}: TI-83 (or 84) Plus graphing calculator

This course has the same content and rigor as that found in a traditional (face-to-face) classroom.
Attendance Policy:
Students are expected to login to the online course at least once a week in order to view any announcements and to participate in the discussion board questions.

Homework:
Homework exercises will be completed through My Stat Lab (MSL). To initially register you will need the courseID: krueger45724. This online program provides resources to aid the student learning with videos, multiple examples, tutorial services and links to the instructor for questions on particular problems. Students may attempt each problem as often as needed in order to get it correct.

Quizzes:
Online quizzes (one per chapter) will be given through My Stat Lab. They can be attempted twice and the higher score will be used.

Discussion Board:
Students will be required to post 2 discussion board responses. One discussion board will have topics to choose from for a short answer that cover chapters 1 to 5. The second discussion board will provide choices of experiments/projects covering chapters 6 to 10.

Exams:
Two proctored exams will be given through the Desire2Learn course site. Proctored exams are administered by approved test proctors or testing centers. You are responsible for identifying a test proctor, and you must do this at the start of this class. Use the proctor approval form provided. You will submit the form to your instructor, who will then provide the proctor with the passwords for the exams.

Evaluation:
Students will be evaluated through assignments, quizzes, and tests. Grades will be determined as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Discussion Board</td>
<td>10% (3% Discussion 1 question, 7% Discussion 2 project.)</td>
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<tr>
<td>Quizzes (best 9 of 10):</td>
<td>20%</td>
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<tr>
<td>Midterm (Chapters 1-5):</td>
<td>25%</td>
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<tr>
<td>Final Exam (Chapters 6-10):</td>
<td>25%</td>
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Grading Scale:

<table>
<thead>
<tr>
<th>Final Grade</th>
<th>Percentage Range</th>
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<tbody>
<tr>
<td>A</td>
<td>92-100</td>
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<tr>
<td>A-</td>
<td>89-91</td>
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<tr>
<td>B+</td>
<td>86-88</td>
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<tr>
<td>B</td>
<td>82-85</td>
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<tr>
<td>B-</td>
<td>79-81</td>
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<td>C+</td>
<td>76-78</td>
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<tr>
<td>C</td>
<td>71-75</td>
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<tr>
<td>C-</td>
<td>68-70</td>
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<tr>
<td>D+</td>
<td>64-67</td>
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<tr>
<td>D</td>
<td>60-63</td>
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<tr>
<td>D-</td>
<td>55-59</td>
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<tr>
<td>F</td>
<td>&lt; 55</td>
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</table>
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MIDTERM (Proctored): chapters 1 - 5

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  10-1: Review and Preview
  10-2: Correlation
  10-3: Regression

FINAL EXAM (Proctored): chapters 6 – 10
**Assignments and Course Schedule: Sept 3 to Dec 13, 2013**

Throughout this course, you will

- take notes from the videos in *MSL*, study the assigned chapters in the textbook, [(ebook link)](link). Be an active learner.
- read and use the outlines for each chapter provided in *D2L*. Watch videos posted in D2L for chapter material and calculator usage.
- complete the assignments at *MSL*.
- select from the additional resources for assistance
  - *D2L Resources*: TI-83 links for guidance
  - *MSL: Tools for Success: Technology manual*
  - Graphing Calculator help is coordinated with the textbook chapters
  - *MSL resources found on each homework page*
    - § Help Me Solve This
    - § View An Example
    - § Video
    - § Tech Help--more guidance on the calculator
    - § Ask My Instructor
  - *MSL Study Plan*-builds on your homework and quiz results to let you know what areas you might want to study prior to testing.

The following is the schedule for keeping on track and finishing on time. **Homework can be worked on after a due date, if you wish to continue to improve the score, BUT Quizzes must be taken by the due dates. You have two attempts at each quiz. If you have questions on the first attempt, please ask before you take the second. Most of the second attempt questions will be the same, but some may be slightly different. Try to take the first attempt within a day of finishing the homework and then the second by the due date. You can take any quiz or exam early.**

The due dates are set based on prior experience with this course and time needed to complete each chapter. They are set as to number of days for each chapter, not based on which day of the week they fall. Examine the number of problems for each chapter assignment in MSL and space these out over the space allotted between chapter due dates however you wish to be done by the due date. Don't wait until day before a due date to get started on a chapter--not much learning is going to happen that way...concentrate on a few types of problems at a time. (5-10 problems a night, or 15 every other night...you decide.)

*MSL* submissions are automatic in the Pearson website. You do not need to do anything on your part for me to view your work. I can see what time, date and how long you spent on any particular assignment.

Due dates are final. Mark your calendars. If you are going on vacation, then get your assignments done early!

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Unit</th>
<th>Chapter</th>
<th>Assignments/Requirements</th>
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<tbody>
<tr>
<td>Sept 3</td>
<td></td>
<td></td>
<td>Enroll in <em>MyStatLab (MSL)</em>, instructor ID needed: krueger45724 Download proctor form and get submitted asap Begin Homework in Chapter 1 of <em>MSL</em></td>
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<tr>
<td>Sept 7</td>
<td>1</td>
<td>1</td>
<td>Complete Chapter 1 homework in <em>MSL</em> Chapter 1 Quiz in <em>MSL</em></td>
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<td>Sept 9</td>
<td></td>
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<td>Last day to submit Proctor form</td>
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<td>Sept 12</td>
<td>1</td>
<td>2</td>
<td>Complete Chapter 2 homework in <em>MSL</em> Chapter 2 Quiz in <em>MSL</em></td>
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<td>Date</td>
<td>Days</td>
<td>Tasks</td>
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<td>Sept 23</td>
<td>1</td>
<td>Complete Chapter 3 homework in MSL</td>
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<td>Sept 25</td>
<td>3</td>
<td>Chapter 3 Quiz in MSL</td>
<td></td>
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<tr>
<td>Sept 29</td>
<td>2</td>
<td>Complete Chapter 4 homework in MSL</td>
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<td>Oct 1</td>
<td>4</td>
<td>Chapter 4 Quiz in MSL</td>
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<td>Oct 6</td>
<td>2</td>
<td>Complete Chapter 5 homework in MSL</td>
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<td>Oct 8</td>
<td>5</td>
<td>Chapter 5 Quiz in MSL</td>
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<tr>
<td>Oct 7-14</td>
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<td>3% of grade: <strong>Answer 1 question out of the choices given</strong> (covering chapters 1 to 5) on 1st Discussion Board in D2L</td>
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<tr>
<td>OCT 8 - 14</td>
<td>1,2</td>
<td><strong>Prepare for and Take the Midterm with a proctor to be completed no later than Oct 14</strong></td>
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<td>1,2,3,4,5</td>
<td>Try the Practice Midterm in D2L: &quot;Other&quot; tab then Quizzes</td>
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<tr>
<td>Oct 27</td>
<td>3</td>
<td>Complete Chapter 6 homework in MSL</td>
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<td>Oct 29</td>
<td>6</td>
<td>Chapter 6 Quiz in MSL</td>
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<td><strong>Read the second Discussion Board Topics and begin to think of which project type might be of interest to you. The next 5 chapters will cover the material that is needed for those.</strong></td>
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<td>Nov 6</td>
<td>3</td>
<td>Complete Chapter 7 homework in MSL</td>
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<td>Nov 8</td>
<td>7</td>
<td>Chapter 7 Quiz in MSL</td>
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<td>Nov 18</td>
<td>4</td>
<td>Complete Chapter 8 homework in MSL</td>
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<td>Nov 20</td>
<td>8</td>
<td>Chapter 8 Quiz in MSL</td>
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<tr>
<td>Nov 25</td>
<td>4</td>
<td>Complete Chapter 9 homework in MSL</td>
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<td>Nov 27</td>
<td>9</td>
<td>Chapter 9 Quiz in MSL</td>
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<td>Dec 5</td>
<td>4</td>
<td>Complete Chapter 10 homework in MSL</td>
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<td>Dec 7</td>
<td>10</td>
<td>Chapter 10 Quiz in MSL</td>
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<td>Dec 12</td>
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<td>7% of grade: <strong>Post your results for second Discussion Board project</strong></td>
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<tr>
<td>Dec 9 -13</td>
<td>3,4</td>
<td><strong>Prepare for and Take the Final with a proctor, to be completed no later than Dec 13</strong></td>
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<td>6,7,8,9,10</td>
<td>Submit SOS evaluation in D2L--see announcement page</td>
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<td></td>
<td>Try the Practice Final in D2L</td>
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