

**Mathematics Department
University of Wisconsin Oshkosh**

**General Syllabus for
PBIS 189 Problem Based Inquiry Seminar
Statistics**

Course Description:

We live in the information age. The abilities to analyze and interpret information displayed in tables, graphs, and formulas are essential quantitative skills for success. This course places mathematics into the context of today's world. Topics include descriptive statistics, data displays, correlation and regression, probability and sampling distributions, confidence intervals, and hypothesis testing. These are used to solve problems in several diverse areas including industrial manufacturing, health care and medicine, politics, polling, and sports.

As a problem-based inquiry seminar, the course will emphasize processes; the approach will be intuitive and investigative. This is not a lecture-based course, and students are expected to be actively involved in the process of mathematical inquiry, including investigating, questioning, conjecturing, reasoning, and making mathematical arguments.

Prerequisite:

Math 103 with a grade of C or better or placement.

Description of Students Who Take the Course:

PBIS 189 satisfies the University minimum general education mathematics requirement. It is not intended for students whose programs require additional mathematics courses.

General Goals and Objectives for the Course:

This course focuses on critical thinking and active learning. Students will be engaged in problem solving and will come to understand that a "problem" is a situation that is unfamiliar and one for which a solution is not immediately evident. Being stuck is a natural state of problem solving and an essential part of improving thinking.

PBIS courses offer the opportunity to develop the ability to distinguish problem solving and critical thinking from exercises and routine thinking and to identify attitudes and beliefs that are conducive to success in challenging situations (and those which are not). The intent is to provide a strong intellectual experience that will enhance the university experience and form a solid base for life-long learning.

Specifically students will

- collect data, observe patterns, make and verify conjectures
- improve their ability to reason logically
- develop effective written and oral communication skills
- improve skills related to critical thinking, problem solving and creativity
- use and understand symbol systems and quantitative methods
- understand principles of mathematics and the sciences.

Textbook and Other Required Materials Recently Used:

The Basic Practice of Statistics, 4th edition by David S. Moore. Some sections require a specific graphing calculator or other technology.

Specific Course Content:

The following list is a suggested list. Course content may vary by instructor.

One Variable Displays and Summaries

- Histograms
- Means, Medians, etc.

Two Variable Displays and Summaries

- Scatterplots
- Regression

Probability

Sampling and Experiments

- Randomness
- Sampling Distributions

Statistical Inference: Confidence Intervals

Statistical Inference: Hypothesis Tests

Variation by instructor:

Although this course has a common content syllabus across sections and course coordination occurs, teaching methodology and evaluation policies may vary. Evaluation may include quizzes, exams, a comprehensive final, and the collection of homework. In addition, instructors of this course may assign projects and reading and writing assignments.

Students should consult the individual course syllabus for more information.

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