

# Introduction to Statistical Methods STAT 1772 (800:072 ) Syllabus

## MEET YOUR INSTRUCTOR

### Dr. Michael Prophet, Associate Professor of Mathematics

As an undergraduate, I was a math major at Shippensburg University of Pennsylvania (near Gettysburg, PA) from 1983-87. After graduating I worked as a computer programmer near Philadelphia; but I missed doing mathematics too much and went back to school. I enrolled in the Ph.D. program in Mathematics at the University of California at Riverside in 1988. I finished my degree in 1993 and went to work at Idaho State University. From there I went to Murray State University (Kentucky) and then to the University of Northern Iowa.

## COURSE OVERVIEW

Statistics is the study of collecting, organizing and interpreting data. This study plays a vital role in multiple areas of many professions. Economists, financial analysts and government leaders depend on statistics involving inflation and unemployment; physicians must understand the implications of statistics appearing in medical journals; engineers develop standards of reliability based on statistical analysis of experimental data. These are just a few of the examples that illustrate the value of learning statistics.

### Course Objectives:

The objective of this course is to introduce the student to the methods and techniques of descriptive and inferential statistics; in addition, the student will learn basic probability theory and set theory.

Specifically, we will learn:

- several ways to produce graphical summaries of qualitative and quantitative data
- several techniques of building numerical measurements for describing quantitative data
- the fundamentals of probability assignment
- the fundamentals of discrete probability distributions
- three specific probability distributions
- the fundamentals of continuous probability distributions
- how to work with normal probability distributions
- the fundamentals of sampling distributions
- how to make point and interval estimates of population parameters
- how to construct and perform a statistical test of hypothesis

### Textbook:

W. Mendenhall & R.J.Beaver. *Introduction to Probability & Statistics*, 11th edition.

This course requires that you purchase a course packet. Course packets are available from Copyworks. Call 319-266-2306 to order your course packet over the phone with a credit card. Packets are available electronically or through hard copy.

## COURSE ORGANIZATION

This course will be delivered over the World Wide Web, utilizing web pages and a learning management system (**eLearning**). The course is organized into 14 Assignments (each containing an Online Assessment as well) and 4 Exams.

### Course Outline:

Descriptive Statistics  
Assignment 1: Graphical Descriptions

Assignment 2: Numerical Descriptions  
Assignment 3: Bivariate Data  
Exam 1  
Probability and Discrete Probability Distributions  
Assignment 4: Basic Probability and Simple Events  
Assignment 5: Counting Rules and Conditional Probability  
Assignment 6: Intro to Probability Distributions and the Binomial Distribution  
Assignment 7: The Poisson and Hypergeometric Distributions  
Exam 2  
The Normal Distribution, Sampling Distributions and the Central Limit Theorem  
Assignment 8: Calculating Probabilities  
Assignment 9: Sampling Distributions and The Sample Mean  
Assignment 10: The Sample Proportion  
Exam 3  
Inferential Statistics  
Assignment 11: Point Estimation  
Assignment 12: Interval Estimation  
Assignment 13: Hypothesis Testing and the Population Mean  
Assignment 14: Hypothesis Testing: Differences in Mean and Binomial Populations  
Exam 4

### **Online Assessments:**

Each Assignment consists of readings from our text and problems from the exercises. The solutions to the exercises are included in the course packet. Also in each Assignment is a section entitled "Overview" - these are additional descriptions of the topics under discussion. You will probably find the overview most helpful after you have completed the corresponding reading assignment from the textbook. Each Assignment concludes with an Online Assessment.

The details for completing the Online Assessment are:

- the Online Assessments are based on the readings and exercises

- you have an unlimited amount of time for each Online Assessment

- you may use your book and notes while completing the Online Assessment; keep in mind, however, that the exams are closed-book

- each Online Assessment consists of 4-7 multiple-choice questions

- the Online Assessments are graded and count toward your final grade

- Need help?** See the [eLearning Tutorials](#) for instructions on how to submit an assignment that is in a quiz format.

### **Exams:**

- you may use any scientific calculator while taking exams

- you have 90 minutes to take each exam

- each exam has 12-14 questions

- the questions are mostly short-answer type; there are a few multiple-choice questions.

- all exams are closed-book

- each exam comes with a Formula Sheet (included in the course packet). You may **not** write additional notes on any of the Formula Sheets - except for the Exam 3 Formula Sheet

- the Exam 3 Formula Sheet is (intentionally) blank - you may write notes/formulas on this sheet for the test. This is the only Formula Sheet on

which you can write notes.

## **GRADING**

Please note that UNI Guided Independent Study requires that you submit all assignments and complete all exams to receive a grade in the course.

There are a total of 590 points available; they are summarized below:

Online Assessment 1	10 points
Online Assessment 2	14 points
Online Assessment 3	10 points
Exam 1	110 points
Online Assessment 4	8 points
Online Assessment 5	12 points
Online Assessment 6	14 points
Online Assessment 7	8 points
Exam 2	110 points
Online Assessment 8	12 points
Online Assessment 9	12 points
Online Assessment 10	8 points
Exam 3	110 points
Online Assessment 11	8 points
Online Assessment 12	12 points
Online Assessment 13	12 points
Online Assessment 14	10 points
Exam 4	110 points