



Elementary Statistics: Pennsylvania State University

(For a list of topics covered in the course, please see http://www.theNCAT.org/R2R/AcadPrac/Topics/PSU_ElemStat_Top.pdf.)

Elementary Statistics is a one-semester, four-credit course that covers the following topics:

Commercial Materials

- Textbook: *Mind on Statistics*

Author: Jessica Utts and Robert Heckard
Publisher: Thomson (Brooks/Cole Duxbury)
Edition: 2nd edition

- Software: *Minitab*

Source: Minitab, Inc.
www.minitab.com

Description: *Minitab* is a widely used statistical software package used in teaching and learning. A powerful graphics system helps students visualize and master the art of data analysis.

How to obtain: A variety of licensing and purchasing options are available. See the Minitab web site for more details.

- Videos: *Against All Odds*

Source: Public Broadcasting Service (PBS)
http://www.pbs.org/als/against_odds/index.html

Description: The videos (26 half-hour programs) provide an exploration of statistical processes, stressing data-centered topics rather than the more traditional path from probability to formal inference. Videos can be used to illustrate particular statistical concepts.

How to obtain: A variety of licensing and purchasing options are available. See the PBS web site for more details.

Materials developed by Penn State University

- Readiness Assessment Tests (RATS)

Description: Students are regularly tested on assigned readings and homework using Readiness Assessment Tests (RATs), which are short quizzes consisting of 13-15 multiple choice items that probe students' conceptual understanding. RATs are given as paper handouts five to seven times during the course and involve several steps. Students prepare to take the RATs outside of class by reading the textbook, completing homework assignments, and using additional resources available through the course web site. Then the students take the tests individually. Immediately following the individual effort, the students take the same test in groups of four or five, with weights of 2/3 and 1/3 on the individual and group parts, respectively.

<http://www.theNCAT.org/R2R.htm>.

In addition to motivating students to keep on top of the course material, RATs provide powerful feedback to both the students and the faculty member. RATs have proven to be very effective in detecting areas in which students are not grasping the concepts; the tests thereby enable corrective actions to be taken in a timely manner and prepare students for higher-level activities in the computer labs. The RATS are available as Microsoft Word files. At Penn State, RATs are machine graded using bubble sheets.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- Study Guides

Description: Penn State faculty have developed study guides keyed to the textbook chapters and the RATS, which provide guidance to students as they prepare for exams. These are available as Microsoft Word files or PDF files.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- Lab Problems

Description: The Penn State faculty have prepared more than 100 lab problems and data sets for them. A web hot button enables data to be imported into *MiniTab* worksheets so that students can manipulate the data as needed. For example, students might compare means of male and female GPAs. Some problems are ill-structured and some well-structured, depending on the nature of variables of the research questions (e.g., an ill-structured problem might include a story in journal article with a question about whether the conclusion was justified). The problems are available as text files in Microsoft Word. Data sets are text files and *MiniTab* worksheets, which are easily exported.

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- Homework and Lab Exercises

Description: The Penn State faculty have developed large exercises that require more time than just one lab period, usually a week or 10 days to complete each exercise. These require students to select the correct statistical procedure and conduct the analysis. For example, one homework set includes 20 story problems in which students must specify the hypothesis and choose the technique. The exercises are available as text files in Microsoft Word.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- Online Lab Quizzes

Description: Penn State faculty give 18-20 quizzes per term. Each quiz has 5-8 questions and the quizzes take 7-8 minutes to complete. These focus on important concepts and are used both to prepare students for exams and to check attendance. The quizzes have been developed in *Test Pilot* by Clear Learning (<http://www.clearlearning.com/>).

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- Projects and Capstone Activities

Description: The Penn State faculty have developed a range of projects and capstone activities that integrate topics from multiple chapters. Examples include studies such as those found in a Gallup poll or links to studies reported in *USA Today*. Another on music investigates opinions about and practices surrounding Napster, an issue that students find interesting. The projects and capstone activities are available as text files in Microsoft Word or as PDF files.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- Data Sets for Projects

Description: The Penn State faculty have created several data sets from surveys that they gave students. Examples include body measurements and other kinds of questions that generate different kinds of variables for assignments. These data sets are text files and *MiniTab* worksheets which are easily exported.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- PowerPoint Slides

Description: The Penn State faculty have developed PowerPoint slides to accompany each of the 15 lectures used in the course.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

How to obtain: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

- Daily Schedules

Description: Because there are many different aspects to the course, the Penn State faculty have developed daily schedules so that students are clear about what they need to do and by when. The schedules can serve as models that need to be adapted to the particular schedules of new institutions. They are available as text files in Microsoft Word.

How to preview: Contact [John Harwood](mailto:jth@psu.edu) at jth@psu.edu.

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