



Introduction to Statistical Reasoning: Carnegie Mellon University

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

Introduction to Statistical Reasoning is a one-semester, three-credit course that uses the following materials:

Commercial Materials

- Textbook: *StatTutor* (described below) can be used with any textbook.
- Software: *Minitab*

Publisher: Minitab, Inc.
<http://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. At CMU, *StatTutor* (described below) is used in concert with *Minitab*. *StatTutor* can work in parallel with any statistical software. Current CMU instructions are for *Minitab*, but these can be replaced by instructions for other statistics packages that instructors choose. For example, another institution is using *StatTutor* with Excel.

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

Materials developed by Carnegie Mellon University

- *StatTutor*

Description: *StatTutor* is a web-based intelligent tutoring system developed at CMU. *StatTutor* presents students with data analysis problems (background on a study, the corresponding dataset, and some questions to investigate) and supports them through the solution. *StatTutor* uses a "scaffolding" approach that provides immediate feedback to students as they navigate the learning environment step by step. *StatTutor* keeps students on course to avoid their wasting time on bad problem-solving strategies, while allowing for exploratory, active learning. Students learn problem solving approaches and strategies as they work through the assigned problems.

StatTutor was designed to address two pedagogical challenges in teaching an introductory statistics course: (1) the course elements (lectures, labs, homework) tend to be focused on particular topic(s). Students, therefore, often get lost in the details and lose sight of the "big picture". (2) Students have problems solving data analysis problems. In particular students have difficulties in choosing the appropriate display and analysis, interpreting the results in the context of the problem and taking a systematic approach.

Since the focus of *StatTutor* is not on teaching the content (e.g., how to construct a boxplot) but rather on how to apply the material in real life situations, *StatTutor* should be used as a supplement to the course (in homework, labs, etc.)

StatTutor can work in parallel with any statistical software. The current instructions are for *Minitab*, but these can be replaced by instructions for other statistics packages that the instructor chooses.

Technical Requirements: Windows, Internet Explorer 5.5 or higher, access to the internet and a statistical package.

How to preview: *StatTutor* is available for preview on the CMU web site at <http://www.cmu.edu/statututor/>.

How to obtain: CMU will host *StatTutor* on their web site. Redesign statistics projects that plan to use *StatTutor* may access it through a Web browser.