

## Appendix

### Contextual Information on Carolina Core Learning Outcomes

*Posted October 13, 2009; Revised Feb 8, 2011; Revised August 2011*

#### **II. Analytical Reasoning and Problem-Solving**

<b>Core Component</b>	<b>Learning Outcome</b>
<i>Analytical Reasoning and Problem-Solving</i>	Upon completion of the Carolina Core, students will be able to apply the methods of mathematics, statistics, or analytical reasoning to critically evaluate data, solve problems, and effectively communicate findings verbally and graphically.

**Context:** Many of the complex problems facing individuals, families, organizations, communities, and society require both qualitative and quantitative analyses and responses. University of South Carolina students must be able to employ both qualitative and quantitative methods to recognize, analyze, and solve problems, and communicate findings and solutions verbally, symbolically, and visually.

Students must understand and apply, as appropriate, principles of analytical reasoning using as a foundation the knowledge of mathematics, statistics, logic, and/or algorithmic principles. They must be able to recognize and use connections among mathematical, logical, statistical, and algorithmic methods across disciplines. They must develop skills in identifying and describing problems using quantitative data and models, elucidating relationships among variables for descriptive or predictive purposes, distinguishing relevant from irrelevant data, evaluating the authority and accuracy of information, and assessing the appropriateness of quantitative methods for the available data. Ultimately, decisions must be made and defended through effective means of communication.

**Foundational courses** that support this learning outcome teach students how to do some of the following: use analytical reasoning with appropriate technology to solve problems; test conjectures; formulate valid arguments; judge the validity of arguments; check answers to determine reasonableness; reflect on both the statistical and practical significance of findings; and communicate the reasoning and the results.

In a Carolina Core **integrative course** in the major, students might demonstrate, for example, the ability to distinguish relevant from irrelevant information, identify missing and faulty information, and determine appropriate and inappropriate means for gathering data and making inferences. Students might apply advanced methods to evaluate evidential and argumentative claims and propose solutions to complex problems.

Students who achieve this learning outcome will be able to:

1. Demonstrate understanding and use of the basic principles, concepts, and terms of the discipline.
2. Identify a problem and define associated variables, expressing quantitative relationships among the variables.
3. Apply basic quantitative methods and analytical reasoning principles to evaluate and solve problems, using appropriate technologies.
4. Evaluate, interpret, and describe data from a variety of sources and in a number of forms (numbers, tables, graphs, and equations.)