About ALEKS (from the company)

ALEKS was developed at New York University and the University of California, Irvine, by a team of software engineers, mathematicians, and cognitive scientists with the support of a multi-million-dollar grant from the National Science Foundation. At the heart of ALEKS is an artificial intelligence engine that assesses each student individually and continuously.

ALEKS is based upon original theoretical work in a field of study called "Knowledge Space Theory." Work in Knowledge Space Theory was begun in the early 1980s by Dr. Jean-Claude Falmagne, an internationally renowned mathematician and Professor of Cognitive Sciences who is the Chairman and founder of ALEKS Corporation.

How does ALEKS work?

ALEKS avoids multiple-choice questions and instead uses flexible and easy to use answer input tools that mimic what would be done with paper and pencil. When a student first logs on to ALEKS, a brief tutorial shows him how to use these ALEKS answer input tools. The student then begins the ALEKS Assessment. In a short period of time (about 45 minutes for most courses), ALEKS assesses the student's current course knowledge by asking him a small number of questions (usually 20-30). ALEKS chooses each question on the basis of his answers to all the previous questions. Each student, and therefore each set of assessment questions, is unique. It is impossible to predict the questions that will be asked.

By the time the student has completed the assessment, ALEKS has developed a precise picture of her knowledge of the course, knowing which topics she has mastered and which topics she hasn't. The student's knowledge is represented by a multicolor pie chart.

The pie chart is also the student's entry into the Learning Mode. In the Learning Mode, she is offered a choice of topics that she is ready to learn (she has the prerequisite knowledge to successfully learn these topics). When she chooses a topic to learn, ALEKS offers her practice problems that teach the topic. These problems have enough variability that a student can only get them consistently correct on understanding the core principle defining the topic. If a student doesn't understand a particular problem, she can always access a complete explanation. Once she can consistently get the problems for a given topic correct, ALEKS considers that the student has learned the topic and the student chooses another topic to learn. As the student learns new topics, ALEKS updates its map of the student's knowledge. The student can observe the most current summary of what she knows and what she is ready to learn.

To ensure that topics learned are retained in long term memory, ALEKS periodically reassesses the student, using the results to adjust the student's knowledge of the course. Because students are forced to show mastery through mixed-question assessments that cannot be predicted, mastery of the ALEKS course means true mastery of the course.