


# Advanced Structural Engineering Training for High School | eLearning Course

**Beam Deflection and Column Buckling - WB805-AA01XEN-E2**

Objective 7: Define Column Buckling and Explain Its Importance

**Define Column Buckling**



When a column is compressed, it can fail at much smaller loads than would be indicated by the column material's ultimate strength.

The failure is indicated by the middle of the column moving out of center and the two ends of the column coming together. This type of column failure is buckling.

As a column begins to buckle, the axial forces move outside of the centerline of the column and begin to form a bending moment. This causes the column to buckle more, which in turn increases the bending moment. This happens very quickly and will continue until the column totally collapses.

AMATROL Page 46 of 74

## eLearning Course: MB805

Amatrol's Multimedia Courseware - Structural Engineering 3 (MB805) covers a variety of foundational industrial topics including: concrete mixing, placement, and testing; how to control column and beam deflection; preventing columns from buckling; and designing buildings to both support normal loads and to stand up to environmental elements. These skills can be used to move into fields like construction, engineering, and architecture. Some of the major topic areas covered by the curriculum include beam and column design, the fundamentals of concrete, building design, and building construction. This interlacing of theoretical knowledge and hands-on skills builds learner competencies and gives them the knowledge to move on to more advanced structural engineering topics.

## Interactive eLearning

### Interactive Advanced Structural Engineering eLearning Curriculum

Amatrol's advanced structural engineering eLearning course features interactive eLearning curriculum that integrates various types of learning methods to create an engaging, effective learning experience. Amatrol's multimedia [eLearning](#) curriculum includes text with voiceovers, videos, 3D animations, pictures, and interactive activities, quizzes, and self-reviews. Specific structural engineering topics covered include: beam deflection & column buckling; deflection of beams; introduction to concrete; concrete mixing & placement; and building research, design, & construction. Within these topics, learners will study objectives like calculating the critical load for buckling a column; mixing and forming concrete beams with and without coarse aggregate; and determining building load paths.

### Free Learning Management System (LMS)

Amatrol eLearning is easy-to-use for both students and instructors. Its web-based interface is simple to navigate and available on any WebGL-compatible Internet browser. Instructors love Amatrol eLearning for its simple, yet sophisticated Learning Management System (LMS). The LMS allows instructors to create custom courses, monitor student participation, track course progress, assess knowledge levels prior to a course, and test knowledge levels after completion. Learners appreciate the fact that they can start and stop as needed, moving through each Amatrol course at their own pace. If a self-review reveals that they didn't understand a particular topic as well as they thought they did, they can revisit it before moving on.

