

80a Using Teamwork and Case Studies in-Class to Teach Chemical Engineering Safety

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Unit Operations and Design courses which feature open-ended assignments designed to help further develop the creative problem solving, critical thinking, and communication skills of outgoing senior Chemical Engineering students helps them achieve a well-rounded learning experience. Oftentimes, Chemical Engineering Safety is a topic that is often lectured, but is viewed by students as perfunctory and in terms of a set group of “common sense” rules that need to be followed. In these Unit Operations and Senior Design courses, a major emphasis is placed on teaching students laboratory and plant safety in the most effective, “active” way possible. In the Unit Operations course, along with class discussions of the worst engineering disasters of all time, students are exposed to the top eight worst chemical engineering plant disasters of all time. Students are given information provided from SChE and become experts on one case study. They then form in-class jigsaw groups to share their findings with other students. Their understanding of this material is assessed through a written exam. In the Senior Design course students are asked to assemble a hydroxylamine plant block flow diagram. The dangers of hydroxylamine are revealed and a case study discussion of the Concept Sciences disaster follows. This inductive learning approach demonstrates the importance of proper HAZOP and Potential Problem Analysis.