118d Plant Design Project: Biodiesel Production Using Acid-Catalyzed Transesterification of Yellow Grease

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The Chemical Plant Design course is the last opportunity for students to practice, in an academic environment, the design and economic evaluation of industrial chemical plants. This course is an excellent opportunity to assign projects in which students synthesize and analyze renewable chemicals production processes. This paper describes the design and ChemCad simulation of a biodiesel (alternative renewable fuel) production facility prepared by students enrolled in the Chemical Plant Design Course. The class format followed an inductive approach.

The students were highly motivated the whole semester for working on a project to produce an alternative fuel. The students worked in groups of four and peer evaluations were conducted several times during the semester. As part of the course, students attended seminars and/or workshops on resume and interview preparation, entrepreneurship, ethics, and process simulation software (Chemcad). They applied Chemcad to prepare and optimize the process flow diagram and design each piece of equipment. The problem statement for the plant design was open-ended resulting in several different and viable designs. During the last week of classes students competed for the best design report and presentation. A panel of judges from industry and academia was organized to select the best presentation. The instructor selected the best report. The students felt that the course was a valuable experience for their next phase as employees in the chemical industry.