What is distillation?
Distillation is a chemical separation technique prevalent throughout industry in processes such as:
- Acrylic acid production
- Petroleum manufacturing
- Pollution control
Chemical separation is achieved by vaporizing the chemical with the highest volatility, that is, the lowest boiling point, and leaving the other chemical in the liquid phase. The more volatile chemical will exit via the distillate, while the less volatile will leave in the bottoms.

Improvement options
One option for distillation column improvement was to modify the column shown in Figure 2, another was to purchase a new column. The last option was to resurrect the Corning distillation column which formerly stood in Gleeson Hall. The Corning column uses tray based separation, has little cost, and will make a great addition to the new lab space when Johnson Hall opens in September, 2016.

What do current senior chemical engineers work with?
- Column is 21" tall with a 1" ID
- Two equilibrium stages
- Limited separation
- Cannot control or adjust reflux

Figure 2. Current distillation column for senior chemical engineers

Figure 1. General distillation column with distillate and bottoms streams containing the high and low volatility chemicals, respectively.

Figure 3. Designated column space in Johnson Hall outlined in blue. Space is 11’4” x 2’4” x 8’4”

How do we reduce the column height from 20’ to 11’ and depth from 7’ to 28’?
- Cut from 9 ideal stages to 5
- Reconfigure feed and reboiler pots to sit at the same height

Key challenge - Fit the column in Johnson Hall

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