

## Flexible Manufacturing Cell

**Description:** With the grand opening of Norm Asbornson Hall in Spring 2019, the M&IE Department's Computer Integrated Manufacturing (CIM) Lab will move to a space in the new building. The M&IE department would like to upgrade its CIM Lab equipment to a level commensurate with the quality of the new facility in support the educational mission of the programs within the department. The task of this team is to research alternatives for automated conveyance with programmable logic control, design a flexible manufacturing cell (FMC) layout for the new space, and develop equipment specifications that can be sent out for quotation.

Some of the newer existing equipment will move to the new building, namely two FANUC robots (one with machine vision capability), an EMCO CNC mill and an EMCO CNC lathe. It is expected that these items will be incorporated into the flexible manufacturing cell. The cell will include automated material conveyance between stations, automated machine loading and unloading, and machine vision. It is anticipated that another robot will need to be purchased, potentially a collaborative robot. All parts of the system must integrate seamlessly.

At the same time, this project would entail the design of a part to be fabricated on the FMC to incorporate all of the technologies of the system. This part would be used to demonstrate the FMC to campus visitors and teach the various CIM technologies in an incremental fashion to engineering juniors and seniors.

The goal is the purchase equipment over the summer and install it in early Fall 2019 semester. The student team would test the system using in a laboratory class (EIND 371), collect data to demonstrate its effectiveness as an educational tool, and make suitable design revisions to enhance the system's performance and/or student experience.