

Introduction:

Our department has a capstone design course, which is offered in both Fall and Spring semesters. It is a senior level course, which builds on what students learned in the rest of the curriculum and requires them to implement the knowledge by working on an independent project sponsored by industry or faculty. Design team is formed and the project is assigned. The industrial sponsor serves as the customer and provides design requirements. The design team will conduct the design following a design process commonly practiced in industry. At the end of the semester, a product that satisfies the sponsor's needs will be developed and evaluated. Final oral and poster presentations are given to a jury that consists of sponsors, industrial guests and faculty members. The complete design is documented in a project final report, which is available to the industrial sponsor.

We do:

1. Engineering
 - Specification development
 - Concept generation
 - Concept evaluation
 - Failure analysis
 - Feasibility and technology readiness analysis
2. Product Design
 - Design (material, form, manufacturing)
 - Design for strength, assembly, cost, manufacturing
3. Product Evaluation
 - Analysis based validation for all engineering targets
4. Process Control
 - Specification development (working with customers)
 - Conceptual design (design and evaluation alternative concepts)
 - Product design (design and evaluate the final product)
5. Engineering Management
 - Plan
 - Documentation
 - Proposal
 - Product development files (PDF)
 - Design notebook

- Final report
- Poster
- Engineering presentation
 - Proposal presentation (faculty and sponsors)
 - Final presentation to juries (faculty, students, sponsors, industrial guests)
- Assessment
 - Proposal (faculty and sponsor)
 - Final presentation and poster presentation (Jury)
 - Final reports (faculty panel)
 - Progress report, PDF, design notebook

We have accomplished:

We have completed many industrial sponsored projects in recent years. The companies involved include: Bishop Steering Technology, Eli Lilly, Geo-Flow, Zimmer, Peerless Pump, Best Access, St. Vincent Hospital, Cummins, and Roberts Salon & Day Spa.

Some of the projects include:

- *Design of a hydraulic press* (Bishop Steering)
- *Design of an agitator for a chemical reactor* (Lilly)
- *Development of a multi-angular drill shaft for assisting installation of Acetabular cup* (Zimmer)
- *Design of an impeller assembler* (Peerless Pump)
- *Design of an impeller fixture* (Peerless Pump)
- *Fixture Design for VR Steering Rack Bishop Steering Technology* (Bishop Steering)
- *Expansion Device for a Geothermal Heating System* (Geo-Flow)
- *Pressurized Chemical Reactor* (Lilly)
- *Bishop Steering Technology CNC Fixture Design* (Bishop Steering)
- *Patented Core Design* (Best Access)
- *Automatic Part Feeder for Bishop Steering Technology* (Bishop Steering)
- *Precision Measurement Device* (Bishop Steering)
- *Wheelchair Tilting Device* (Robert Salon)
- *Design of an Adjustable Sidelyer for Premature Infants* (St. Vincent Hospital)