

MIE Project Sponsorship Opportunities

Industry Sponsorship Benefits

These projects present an opportunity to:

- Introduce new concepts into your organization (e.g., optimization to reduce production time, simulation to compare various scheduling alternatives, Lean Manufacturing practices, data visualization and analytics)
- Attain significant improvements to your organization
- Identify bright, future engineers who will soon enter the workforce
- Access expertise of our faculty members who interact closely with the student teams and are at the forefront of their fields.
- Provide a low-stress, low-risk environment for employees to refine their project management skills and/or learn to use specific equipment and software.
- Support community and educational outreach as an integral part of your business plan.

For more ideas on how to make the most out of your sponsorship, check out the American Journal of Engineering Education article: [Industrial Sponsor Perspective on Leveraging Capstone Design Projects to Enhance their Business.](#)

You can view abstracts and presentations from our Spring 2021 capstone projects on our [department website.](#)

Industry Sponsorship Expectations

1. **At least one semester ahead:** Capstone project proposal (~1 page)
 - a. Define project in as much detail as possible
 - b. Identify available data and personnel to support project
 - c. Specify expected deliverables
 - d. Monetary commitment to capstone program (\$TBD)
2. **During the semester:** Regular meetings (bi-weekly is encouraged)
 - a. Students provide project updates to sponsor, ask questions and request information
 - b. Sponsor provides feedback, ensuring engineering assumptions are appropriate and in alignment with next steps
3. **End of semester:** Project deliverables
 - a. Students will provide a written report and presentation, as well as any prototypes (algorithms, designs, physical) they complete
 - b. Students present their work at the public end-of-semester project design showcase. Sponsor is encouraged to attend (and judge if interested).

Project Opportunities for Fall 2021

Mechanical Engineering Capstone Projects

What makes a good Mechanical Engineering Capstone Project?

- The projects should be of high potential value to your organization, typically something you want to do, but you do not have the resources or knowledge to do yourself.
 - It is NOT a pressing need for your organization

What topics and tasks would be appropriate?

- A **new design or redesign of a mechanical system** to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- The design (or some portion of the design) **must be prototyped** to help validate the design concept.
- Projects requiring the application of engineering design and analysis in **classic topics** such as: thermodynamics, fluids, statics, stress, dynamics
- Projects requiring the application of engineering design and analysis to **new topics** such as: additive manufacturing, materials, medical device design, machine learning, augmented reality, digital transition of manufacturing

Sample Projects

1. Custom chair to lift and lower a mobility impaired person from bed height to the floor.
 - Deliverables: Fabricated prototype
2. Traverse system to measure and calibrate the flow of water across a flume.
 - Deliverables: Fabricated, functional prototype that interfaced with control system.
3. High cycle fatigue test system
 - Deliverables: Fabricated, functional test fixture and control system to perform high-cycle fatigue testes on specimens.
4. Design of a low cost, purpose-built pick and place machine
 - Deliverables: Fabricated prototype 1.5 axis vacuum machine
5. Ergonomic improvement of foundry molding process
 - Deliverables: Analysis and prototype of mechanism to remove upper shoulder load from molding operator in a highly constrained factory floor.
6. Design of a parts feeding machine
 - Deliverables: Design of a feeding drum to orient and place candy, speed matched to a moving conveyor.

If you are interested in sponsoring, please contact Jim Lagrant jlagrant@umass.edu with your draft idea by August 9, 2021