

Mechanical Capstone Design Project (ENME 501/502)

Information for Proposing Capstone Design projects

2022-2023 academic year

University of Calgary

Department of Mechanical and Manufacturing Engineering

June 2022

Dear Project Sponsor,

We would like to thank you for considering the sponsorship of an engineering design project for fourth year students of the Schulich School of Engineering, University of Calgary. Our fourth-year capstone design courses bring groups of students together to apply their academic and engineering skills in a single unique project. Listed below are the potential benefits of your participation via project sponsorship.

- Give back to the community and create a strong corporate or research connection with the University of Calgary and our undergraduate students.
- Experience personalized professional development by mentoring a group of engineering students. Note that mentoring time from participating in this program can be reported as PDH with APEGA.
- Get help on back-burner type projects that have been lingering in your company.
- Find a new perspective on old issues by working with engineering students through a disciplined engineering design process.
- Gain recruiting exposure with the graduating class of engineering students.

Through our experience connecting industry and research labs with design education, we have found the following project criteria that help both the students, and the project sponsors succeed.

- Projects should involve the aspects of design, engineering analysis, and verification.
- Projects should have a scope suitable for a group of 4-6 students working over an 8-month period. The expected number of hours spent on all aspects of this course is 260 hours of work per student over an 8-month period. This includes individual studies, technical work, meetings, documentation, and project management.
- Projects should not have urgent or strict deadlines.
- Projects should be flexible and allow for multiple solution ideas to be explored.
- Project outcomes should satisfy a demonstrable need and have value to your organization.
- Projects leading to physical prototypes are preferred if prototype can be made at a reasonable cost and within the timeline of the course.
- Projects should use known technology – there is not enough time in the course for large technological uncertainties that relate more with research and developmental aspects.

If you agree to sponsor a design project, please fill in the Project Proposal Form circulated with the document, providing a clear description of the project, the expected outcome, the value to your organization, and

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deliverables, and the type of support (financial/technical) that your company/research lab/etc. will provide. Also, assign a representative who will be liaising with the students and the course instructor on a regular basis.

Based on experience, there is a clear correlation between the quality of the projects and the level of engagement of the project sponsor. It is expected that the students be provided with a reasonable amount of advice and mentorship from your side over the term of the project to make the project a success. The minimum expectation is for the students to meet the industry representative at least two times during the Fall and the winter semesters, respectively. Weekly meetings are also suggested and encouraged. The objective is to ensure the project's progress, and the outcome meets the sponsor's expectation. Furthermore, interactions with the project sponsor would provide students with the opportunity of working with fellow industry professionals and gain real-world problem-solving exposure and experience. The following are the contractual notes that apply to this sponsorship relation.

Contractual Notes	
Deliverables	While functional prototypes are sometimes developed through the completion of projects, the only deliverable that the Department of Mechanical and Manufacturing Engineering can guarantee is a final report drafted by the student group working on the project. Furthermore, we cannot guarantee that the report will contain significant findings.
Project Costs	While limited supports for the prototype development are available (e.g., materials, 3D printing and access to machine shop), the Department of Mechanical and Manufacturing Engineering will not provide any other financial support for completing the project (e.g., any unusual or major single item expenses involved with fabrication of the prototype). Costs need to be discussed, decided upon, and borne by the student group and/or the project sponsor.
Intellectual Property	It is the responsibility of the sponsor to take action to secure and protect any intellectual property that may arise.
Due Diligence	Since these projects are conducted by engineering students who have not yet been accredited with Professional Engineering status, the sponsor must perform due-diligence on any design or information that arises from the course before utilizing or implementing the design. Therefore, the University cannot take any responsibility for liability.
Mentorship	A company representative should meet with the student group at least three times: two times in the Fall term and at the final presentation. However, there is a strong correlation between sponsor engagement and project outcomes. In addition to a mentor, it is nice to have a champion within the company that is interested in the successful outcome of the project and can provide ongoing support and mentorship to the students.
Confidentiality	The Department and the University will not contract for confidentiality associated with the sponsorship of a project in this course. As an educational institution, we need to have the flexibility to discuss the project with the students and faculty project advisors. Further, we do not have the control over our students that occurs within an employee/employer relationship, making it difficult to maintain confidentiality.



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Educational Mission	In this course, the mission of the University is educational. While sponsors can derive great benefit from their involvement and sponsorship, ultimately the sponsor must be receptive to the course curriculum and support of the educational objectives.
Voluntary Financial Support	A design project involves various material and overhead costs (e.g., faculty / technician time, teaching assistants, course administration, building and testing prototypes, and design and simulation software). To sustain high-quality engineering design education, it is appreciated if the sponsoring companies can consider voluntary financial support.

Please do not hesitate to contact me (403-220-3632; aramirez@ucalgary.ca) if you need further information. We look forward to a rewarding relationship between your organization and our students over the course of this fourth-year capstone design project.

Special Notes about COVID-19

Due to the restrictions for COVID-19 being relaxed, we should expect the capstone projects to proceed in a traditional manner (e.g., in person meetings and project reviews).

Sincerely,

Dr. Alex Ramirez-Serrano and Dr. Joseph Thekinen
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