Biomedical Engineering
UNIVERSITY OF COLORADO **BOULDER**

Biomedical Engineering Program
Discovery Learning Center
521 UCB
1095 Regent Drive
Boulder, CO 80305

Summary of intent of course and client matching process:

Student teams are paired with industry clients to design and build a system based on the needs and specifications of a client. Clients range from small companies to large corporations, from individual entrepreneurs to multi-national organizations, and from start-ups to well-established entities. Student teams are matched with industry sponsors by the instructor of the course using an in-depth survey. Teams and projects are matched to optimize the placement of student teams with clients and projects.

Sponsor Benefits

- **Products:** Sponsors obtain a functional prototype with documentation at the end of the project.
- **Ideas:** Sponsors benefit from new ideas and approaches undertaken by student teams.
- **Recruitment:** Close interaction with student teams provides sponsors with a unique opportunity for recruiting new graduates.
- **Collaboration**: Integrated teams comprised of faculty members, industry sponsors, and students focus on the successful completion of the project.
- **Outreach:** Sponsored projects are showcased to the local community as well as other companies at a public design exposition each spring (unless otherwise restricted by Sponsor for intellectual property reasons).
- The starting program fee of $5,000 is often an efficient expenditure on the part of the Sponsor as opposed to internally developing the ideas and prototypes that result from participation in the program.
- As may be appropriate, all BME senior design students become familiar with the sponsoring organization as the assigned team learns about the company's needs and goals to successfully complete the project and share this with the entire class.

What Project Sponsors Can Expect

Corporations, small businesses, national laboratories, R&D organizations, and non-profit organizations may become project sponsors. When defining a project, sponsors should understand that the purpose of the Senior Design curriculum is to provide undergraduate student teams with a real-life experience of delivering a tested and functional prototype and documentation in response to the Sponsor project definition. This experience is carried out by largely self-directed, but coached, teams that employ fundamental

engineering principles to make design choices, choose and apply state-of-the-art development tools, overcome design challenges, and seek to understand the development process they follow.

All project concepts should have a clear purpose with a recognized value to industry or society with specific functional objectives yet provide significant design challenges that allow students to explore various design solutions and make design choices based on sound engineering reasoning. At the same time, projects must have a level of complexity that is compatible with a 5-person team of BME seniors, working on average 15 hours per week each, for two semesters.

Within the framework of the course, all projects are conducted on a best-effort basis by students, guided by staff and in close collaboration with the sponsor. The sponsor should understand that our primary purpose is educational; as such, exploratory or proof-of-concept projects can be quite successful. Projects that are in the customer's critical path should not be submitted as senior design projects unless the customer takes full responsibility for the outcome. "Good-to-have" results and "proof-of-concept" engagements may be more suitable. The goal is to make every project a success, although the University of Colorado cannot take any responsibility for results deemed by the customer as "insufficient."

Student teams are required to have an organization chart detailing individual responsibilities. Each student must assume at least one type of leadership position. Since the teams are small, students typically assume multiple technical functions.

Each team will work directly with sponsors and course instructors, who will advise a particular team project and manage the team directly through weekly meetings. In addition, course instructors will review and evaluate various aspects of all projects throughout the two semesters. The BME Program faculty will support senior design teams on project- related questions, providing expertise and experience for the students and sponsors to draw upon. Students are also encouraged to seek out other sources of expertise, information, and advice from university staff, industry, and literature to support their project development. Teams work with their sponsors to identify the documentation and other materials needed to satisfy the project goals. Form and degree of detail of various documents including requirements statements, architectural and detailed design, test plans, etc. will be driven from course assignments and sponsor needs.

What is Expected from Project Sponsors

All sponsors are asked to be active participants in their sponsored project. Sponsors should provide a Technical Lead, or Mentor, who can dedicate at least one hour per week to the project. Close contact with the team during the project definition phase is

critical for success. Frequency of sponsor-team interactions will vary and is jointly scheduled by the sponsor and team. In addition, participation in the course requires the following financial commitment from sponsors:

Contract: A $5,000 fee is charged if your organization wishes to retain project-related IP and prototype hardware. In this case a contract will be created through the University of Colorado Office of Contracts and Grants (OCG). Students assigned to these projects will be made aware of the requirement to sign over their intellectual property rights.

Payment Terms:

- **Option 1:** Full payment can be provided upon full execution of the contract. No later than September 1 or the beginning of the course work.
- **Option 2:** Payment is divided into two payments of $2,500, with the first payment due on September 1st at the beginning of the course work in the Fall Semester, and the remaining $2,500 is due by January 1st, at the beginning of course work in the Spring Semester.

Please note, we cannot accept credit card payments.

Export Controlled Items: These projects are conducted by CU students of varying backgrounds and futures. The University of Colorado cannot receive any EAR or ITAR controlled information because we cannot control where these students go after they graduate at the end of the course.

Sponsor Participation Timeline

- **Aug 1:** Submit a required Project Description form
- **Early Sept:** Teams submit project proposals to sponsors. Each sponsor has 1 week to review team proposal and provide ranking of teams
- **Mid Sept:** Teams and sponsors are paired. Meet with project team to finalize project scope
- **September:** Contracts are fully executed by the CU Office of Contracts and Grants
- **Throughout fall semester:** Be available to help the team refine project goals and scope. Work with team to identify a meeting/communication pattern. Attend major presentations and provide feedback, such as: Spec & Planning, PDR, CDR and End of Term. Read and provide feedback on technical reports
- **Throughout spring semester:** Continue to be available to meet with team to track progress during fabrication and testing, as well as provide input when design issues arise
- **End of spring semester:** Attend the Design Expo to see the results of your support!

Project Proposal Submission

- Please complete the project proposal form and remit to Lisa.Romero@colorado.edu
- The 2025-26 AY submission deadline is June 30, 2025

Questions

Please contact Lisa Romero de Mendoza with project questions at Lisa.Romero@colorado.edu