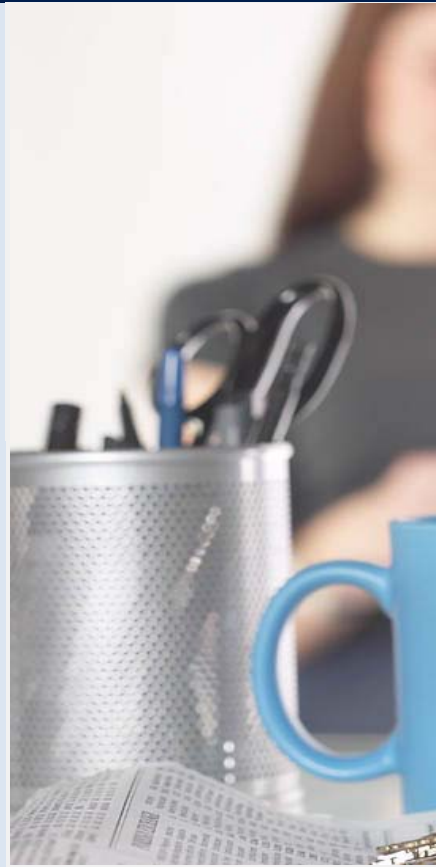


BYU

CAPSTONE

Liaison Engineer Guide



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“Research indicates that students work harder and more creatively when their projects are authentic and of real consequence to a company”



Welcome to Capstone

We are excited to partner with you this year in Capstone! Brigham Young University’s Capstone course (ME 475 & 476) has gained a reputation as one of the finest mentoring experiences for students of its type in the country. Your role as liaison engineer is integral to each student’s educational success and positive outcomes for your company. With your help, we know that this will be a successful year. We are excited to work with you to help these remarkable students become leaders in learning a practical design process while focusing on completing a successful design and build project with high quality documentation.

Dr. Robert Todd – Director

Dr. Carl Sorensen – Co-Director

Jim Trent – External Relations Manager

Paula Harper – Administrative Assistant

Capstone Overview

The Capstone course, or the Integrated Product and Process Design program is a two semester educational program for senior students. This program enables cross-functional student teams from a variety of disciplines (Mechanical Engineering, Manufacturing Engineering Technology, Electrical and Computer Engineering, Industrial Design, and others) to work on real, industry-sponsored projects.

Each team is assigned a faculty coach and works closely with a liaison engineer from the sponsoring company. Research indicates that students work harder and more creatively when their projects are authentic and of real consequence to a company. Over the two semesters, students are taught a structured design process and are then given a chance to use this process to design and build real hardware.

The faculty coach and team develop a relationship with you as the liaison engineer and come to appreciate the needs and wants of your company. Capstone is a course of study that includes class time, lab time, and independent work time as teams. Many activities that students participate in help them progress towards their goal of a solution for their project.

Capstone students will participate in the following:

1. Create a team name and logo
2. Determine customer needs, develop a project plan including a project objective statement, and develop functional specifications
3. Provide regular communication with the liaison engineer via e-mail, telephone, and other means
4. Generate and select design concepts to meet customer needs
5. Develop proof-of-concept hardware and analysis for design concepts
6. Create a design proposal package which justifies the chosen concept
7. Develop a detailed part and process design
8. Participate in design reviews
9. Formally present their work
10. Prepare a final documentation package consisting of all project information appropriate for the sponsor. This material will be delivered to the project sponsor in April.
11. Complete project hardware

Liaison Engineer Responsibilities

As a liaison engineer, your support is vital to helping the student project teams succeed in the Capstone course. We do not want you to jump in and do the project, but we do want you to be an effective advocate for the wants and needs of your company. The responsibilities of the liaison engineer fall into four general areas:

1. Monitoring project progress
2. Maintaining a proper and effective relationship with the faculty coach and team
3. Evaluating project results
4. Providing regular & honest feedback

The common thread that unites these responsibilities is effective communication! Each of these responsibilities is discussed in a separate section below.



“Your support, as a liaison engineer, is vital to helping the student project team succeed”



“Project progress can be effectively monitored by liaison engineers through contact with the Capstone team and team leader”



“We encourage liaison engineers to arrange at least one visit to the sponsor facility for the Capstone project team and faculty coach and more where possible. Experience has shown that frequent contact between the team and sponsor increases positive project outcomes”

1. Monitoring Project Progress

As the team liaison engineer, you are the primary person at your company who monitors the progress of the project. We do not want you to consider the project a faculty project; it is and must remain a student project. Project progress can be effectively monitored by liaison engineers through contact with the Capstone team, team leader and faculty coach.

a. Contact with Capstone Team

Experience has shown that teams have limited success when the team works on their own without frequent contact with the project sponsor. This leads to surprises for both the company and the team. The company is surprised when the work of the team fails to meet their needs. The team is surprised when the company is disappointed with their efforts. Through regular, effective contact with the team, both of these problems can be avoided.

For companies that are close to Brigham Young University (BYU), we recommend that you attend team meetings on occasion. Consider having some of these meetings take place at your company, where other personnel can be in attendance. At these meetings, we hope you will let the team leader be in charge, but we want to ensure that your needs and wants are brought up so that the team can work with you to meet them. For companies that are not located near BYU we have speaker phones and web based meeting capabilities available for use by the team. It is also possible for the team to use a video conference room. This should allow the team to have meetings with you, even though you are at a remote location.

We would also like to make sure the team visits your facilities. For companies outside of Utah, we hope to arrange at least one trip. For local companies, we expect to have multiple trips. Where it is possible, we like to have teams make final presentations of their work at the sponsor site. Please keep in mind that all travel by the team outside the state of Utah is to be paid for by the sponsoring company, so these trips should be carefully planned between you and the team.

b. Contact with Team Leader

In addition to your contact with the entire team, we suggest that you contact the team leader on a frequent basis. We will try to have the leader contact you weekly to update you on the project status and to get your feedback. If you are not getting weekly calls, feel free to call the team leader at your convenience. We will provide you contact information for each team member and the faculty coach.

During your weekly calls with the team leader, you may feel free to discuss your perceptions of the team performance and give any advice you have to the team leader. It would be best if this advice were correlated with the team coach first, so that the leader hears a consistent voice between the company and the faculty coach.

c. Written Communication

Teams prepare a progress report that is emailed weekly. These weekly progress reports will often have attachments including results relating to the project team's work on the project to date. Teams also have send and receive FAX capability at (801) 422-0516. If you are dissatisfied with the progress of the team or feel they have a misunderstanding of your needs, an email from you that carefully lays out your best thinking on the problem at hand can be of great help to a team. Not only does it provide a written report that the team can read over and over again, but it also serves as a basis for future discussions with the team.

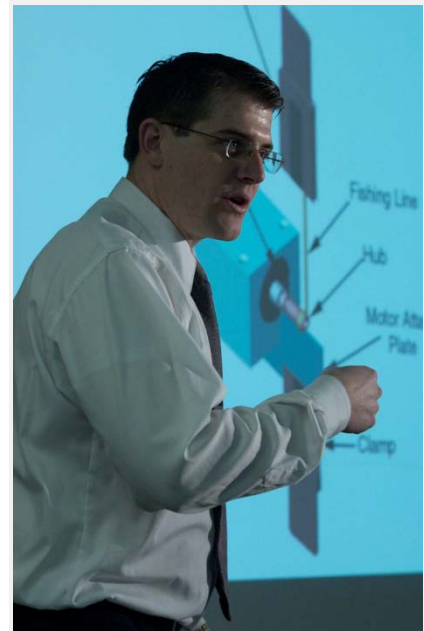
2. Maintaining a Proper & Effective Relationship with the Faculty Coach and Team

One of the most important things you can do to help the team succeed with the project is to maintain a good working relationship with the team coach. The coach has the strongest effect on the team from the BYU point of view. Your relationship with the coach will include meeting the coach, maintaining an appropriate project scope, and ongoing communication.

a. Meeting the Faculty Coach

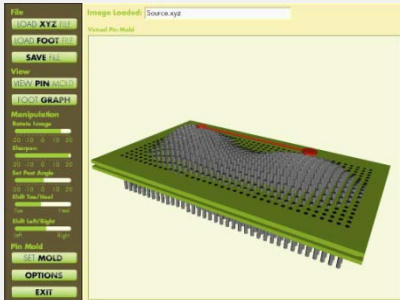
Before the start of school, a faculty coach will be assigned to your project. To give the coach more information about the project, we will provide them a copy of the Proposed Project Summary Sheet that the company filled out. Part of the information on this sheet will be your name. As soon as they receive the sheet, the coach will give you a call. He/she will discuss the project with the company and come to some preliminary decisions as to what will be an appropriate scope for the project.

“Regular communication with the Captone project team helps improve the positive outcomes for the project”



“One of the most important things you can do to help the team succeed with the project is to maintain a good working relationship with the team coach”

Project Sponsor



*Project Objective Example:
Create an automated workstation capable of producing a pair of custom foot orthotics in 30 minutes by April 1, 2008*



b. Scoping the Project Properly

As part of the project acceptance process, the Capstone Directors and External Relations Manager will have done what they can to scope the project properly, based on the information provided on the Proposed Project Summary Sheet and other communication with the sponsoring company. However, as you meet with the faculty coach and team, you will need to teach them more about the project and the scope that the company envisions.

A vital key to the success of the project is scoping the project properly. If the scope is too small, the team will not see the project as important and may not invest their full efforts. If the scope is too big, the company will expect the students to spend too much time on the project. The students will either be resentful or will fail to do what the company expects, due to the time constraints. We invite you to work closely with the project team and faculty coach to ensure that the project scope is appropriate throughout the project duration. The Capstone External Relations Manager is also available to help resolve issues or concerns about project scope.

As rough guidelines, you should expect that the student team can spend 600 to 800 hours working on the project. Remember that students will be less efficient than practicing engineers, particularly early in the project. Remember also that the team will be expected to produce detailed designs in addition to hardware prototypes. As a rule of thumb, generally projects that require over 30 or so major components are too complex for a Capstone project.

If the scope of the project appears too large to the faculty coach and the team, they will negotiate with the company to see what can be done to reduce the scope. They may choose to take only certain subsystems and allow the company to take the rest, or they may agree to do system design and leave some of the details to the company. Whatever the final agreement, we hope you and the coach will do your best to make sure that the team will have the opportunity to design, build, and test some kind of hardware.

Each year we seem to have a project or two that requires a computer interface. We have learned that it is inefficient to have our design teams work on extensive software design. If your project has extensive software, we recommend that the team specify the software and supervise its delivery. In addition, the team may have a number of additional resources to complete the software. They can hire a student or an outside company to develop the software, with the sponsor agreeing to pay these costs. They can try to purchase commercial software that will meet your needs. In each of these cases, the student team is responsible for specifying and obtaining the software, rather than building it.

c. Ongoing Relationship with Faculty Coach

Once you have established good relationships by meeting with the faculty coach and scoping the project appropriately, it requires only a little effort to maintain these relationships. We suggest that you should talk with the coach weekly. If the coach does not call you, feel free to call them. In these discussions, share with the coach your feelings about how the team is doing. During these conversations, you should be an ally in moving the team forward. If you are unhappy, let the coach know about it. If you feel like the team needs to hear some specific comments, tell the coach. Together, you and the faculty coach can have a tremendous effect on the progress of the team. We invite you to work with the coach to make sure you are partners in helping the team succeed.

“You and the faculty coach can have a tremendous effect on the progress of the team. We invite you to work with the coach to make sure you are partners in helping the team succeed”

3. Evaluating Project Results

Working towards tangible results for a real industrially-sponsored project is important in meeting the educational outcomes of the Capstone course for our students. Your project is a key in helping facilitate student learning throughout the design process. To increase the likelihood for a successful project outcome, it is important that you review project results throughout the two semesters. Your review along with the team’s coach is important to help facilitate a positive outcome for the students and the project.

We encourage you to provide prompt and careful attention to the results provided by the project team. Please be sure that they are addressing your needs and if not, contact the faculty coach and team to develop a strategy to help the team accomplish its task.

Students value your opinion and are generally eager to address concerns that you may have. If you expect the team to produce quality deliverables on time, let them know this. You'll tend to get what you expect.

4. Providing Regular & Honest Feedback

Throughout the two semesters, you will be asked to provide feedback to Capstone. This will include three feedback surveys (October, January, and May) to assess the performance of Capstone, the project team and the coach. We encourage you to provide honest feedback that will help Capstone know what it is doing well and to identify potential areas for improvement. The first two surveys will enable Capstone, the team, and the coach to make appropriate corrections to increase the potential for a successful project outcome. In addition to the surveys, you will have an opportunity to communicate on a regular basis with the project team. We encourage you to provide feedback throughout the project to help facilitate a positive outcome.

Evaluation Rubric Example

Category	Pts
To what extent has the team clearly described the current status of the design project?	5
To what extent has the team clearly discussed the most pressing development issues?	5
To what extent is the team resolving (or has developed a plan to resolve) the most pressing issues?	5
To what extent is the team on track in meeting the sponsor’s needs?	5
To what extent is the team’s presentation of materials professional?	5
Total	25

“We encourage you to provide honest feedback that will help Capstone know what it is doing well and to identify potential areas for improvement”

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Keys to Success as a Liaison Engineer

In addition to the above responsibilities, we have some brief hints for finding success as a liaison engineer. These include the following:

1. Support the design process as taught in the class. You may want to add your own strengths, but please don't take off on an extremely different approach.
2. Clearly communicate your perception of how the team is progressing with the faculty coach and team. If you are unhappy, let them know about it. If you feel like the team needs to hear some specific comments, tell the coach.
3. Develop an expectation that the project will be successfully completed on time.
4. Make time available for your team. Communicate with the coach and team weekly.
5. Let the team know you are counting on their work. Explain the impact that the project will have on the company.

We are embarking on a great adventure of teaching students the practice of engineering. We hope you enjoy the journey as much as we do!

"We look forward to another successful year with your Capstone project support"

