A quick scan of the engineering literature and a few conversations with engineering colleagues at other universities show that more and more, engineering faculty are involving industry in their classes and labs. Often the industry involvement in a course also signals a design project in the course. In the engineering literature, an article on the former will often include a discussion of the latter, or vice versa.

Who? Who is “industry” exactly? Most commonly, we think of representatives of for-profit engineering industries or businesses, but “industry” can also include representatives of the public service and the not-for-profit sector, faculty from other courses and departments, and other Faculties or units within the university (e.g. Physical Plant).

Why? The most common motivation to involve industry in a course is to inject some “real-world” input into the course for the students’ benefit. For students, seeing and working with the real-world context of the consulting office, the manufacturing floor, government departments, or the R&D company can increase their motivation, enhance their overall education, and expose them to various areas of engineering practice.

For industry, getting involved in a course can provide industry an opportunity to influence the engineering curriculum (“industry-driven education”), a sneak-peak at potential future employees (“workforce development”), and a chance to obtain concept development (“cheap labour”).

Industry involvement can also support faculty goals. It gives faculty members chances to enhance and develop connections to industry. It allows faculty members to change their teaching roles in the classroom and explore teaching innovations.

What roles can industry play in an engineering course?

Consider industry for a co-teacher or guest speaker in the class or lab. Higher on the “time-and-planning-intensive” scale are arranging mentor-mentee relationships between industry and students, organizing job-shadow opportunities, and longer co-op and internship placements. Job shadowing can be extended to faculty job-shadowing engineers in industry, or industry job-shadowing engineers in teaching & research.

In courses that involve projects, industry roles can include one or more of the following:

- Project provider, becoming the client or customer to the student or student team;
- Project sponsor, providing the project itself as well as project funding, equipment, materials, and/or technical expertise;
- Project liaison, providing the project itself as well as dedicated staff time to guide the student project team;
• **Consultant or technical resource** to the student project team, but no direct connection to the project;
• **Jury**, providing informal or formal assessment, critique, or evaluation of the project itself and the student project team; and,
• **Providing awards** to the student project teams.

Feeling ambitious? One university (Short et al., 2003) uses three types of industry involvement in the final year of the manufacturing & mechanical engineering program: At the end of third year, students take part in the *Industrial Problem Solving* course, a two week course divided into a week of training at the university (learning design and manufacturing technologies) and a week applying that training within a company. The fourth year curriculum includes *Investigative Projects*, in which pairs of students intern with a company for a two-week period at the end of the term, tackling a problem faced by the company and building on the semester’s worth of lecture material. Finally, *Teaching Days* are single days throughout the year where students spend a day within a company, selected to highlight a particular part of the course. The day includes a brief presentation by the host company, and then the students use the remainder of the day to tackle a problem relevant to the company.

**What are we doing in our Faculty of Engineering at the U of M?**

It seems that we have a running start in getting industry involved in the curriculum. A number of courses in various departments use industry as **project liaisons & sponsors, guest speakers, and co-teachers**. All of our programs offer **co-op education or internship options** to students. Our unique **Engineers-in-Residence** initiative gives us built-in industry right on-site.

John Kaye, P.Eng. in Electrical & Computer Engineering, Mal Symonds, P.Eng., Paul Zanetel, P.Eng., and Carolyn Geddert, P.Eng. in Mechanical & Manufacturing Engineering, Walter Saltzberg, P.Eng. & John Frye, P.Eng. in Civil Engineering, and Kris Dick, P.Eng. in Biosystems Engineering are available to all faculty members to collaborate on courses, labs, student technical societies, and research activities. As well, the **UM IDEA program** works over the summer to recruit projects and project liaisons from industry on behalf of our faculty members who wish to include projects in their courses.

**Want to read more?** Here’s a small sampling of articles that address industry involvement in some form in engineering courses.


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Feedback always welcome! Contact us at Design_Engineering@Umanitoba.ca