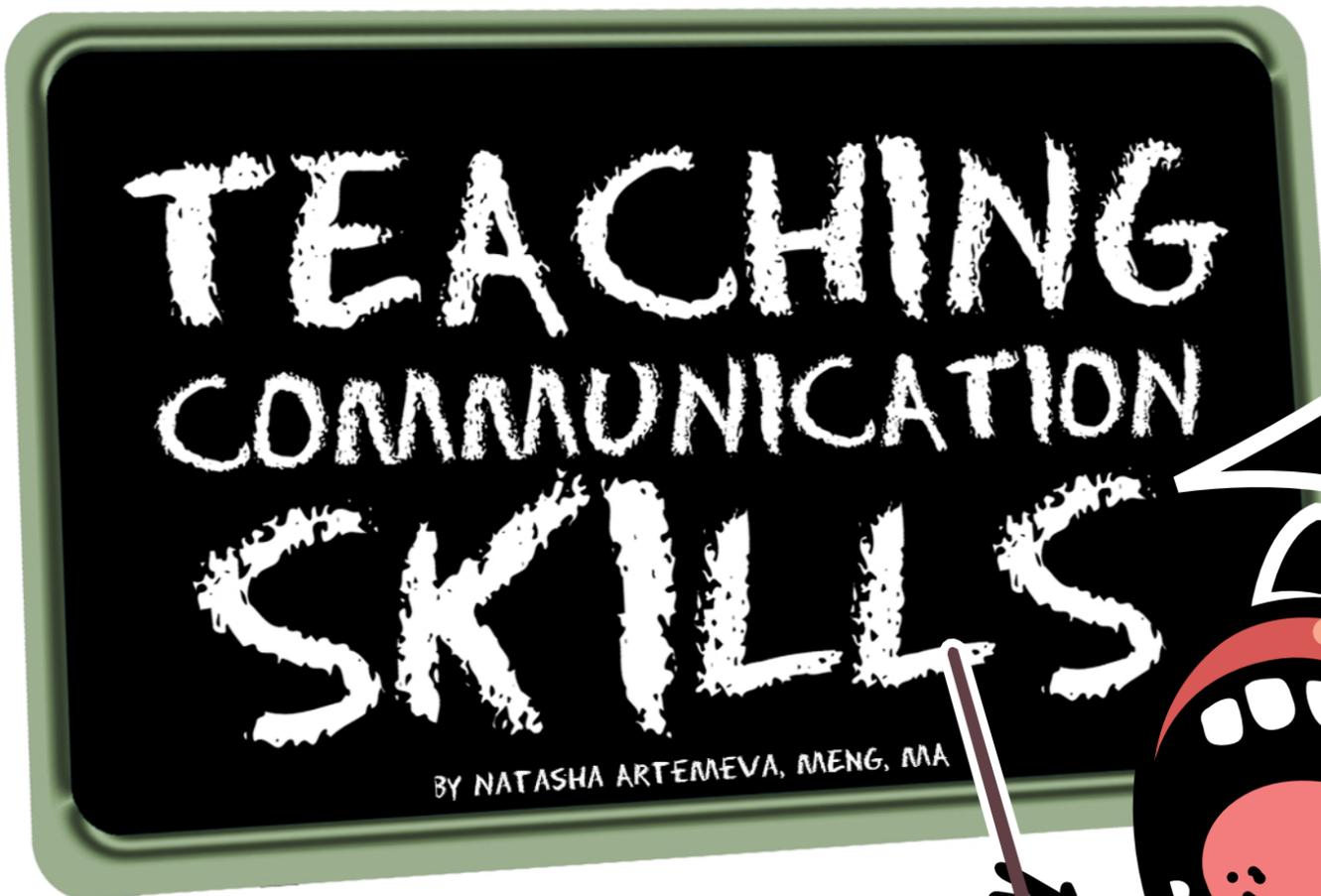


BEYOND THE LANGUAGE BARRIER



Communication skills training can be a hard sell among busy engineering students, but as professionals they won't get far without it. In fact, communication skills are the lifeline of any career. Carleton University has found a way to get the message across.

Today, it's not enough to have topnotch engineering skills. Employers looking to hire engineers often stress the importance of good technical communication skills, both oral and written. They expect new graduates to be able to communicate successfully with colleagues, managers, technicians and clients and to adapt technical information to the requirements of such diverse audiences.

The Canadian Engineering Accreditation Board, the standing committee of the Canadian Council of Professional

Engineers responsible for accrediting engineering degree programs for licensing purposes, has officially recognized the importance of communication skills for the profession. Its policy on the purpose and criteria for accreditation of engineering programs states: "Accredited engineering programs must contain not only adequate mathematics, science and engineering, but they must also develop communication skills..."¹

To respond to this growing demand for engineering graduates with a cross-section of skills, in 1997, Carleton University intro-

duced into its engineering curriculum the "Communication Skills for Engineering Students" course. Compulsory for all Carleton engineering students, the course is offered in the first and second year of their studies. Its major goals are to introduce students to professional engineering communication and to prepare them for a smooth transition to upper-year engineering courses and the workplace, including co-op and internship terms.

OVERCOMING RESISTANCE

First- and second-year engineering students tend to resist the notion that engineering as a profession requires extensive written and oral communication. Our three-year study of students' attitudes toward the role and place of technical communications in engineering school curricula shows that students often dislike technical communication courses, labeling them as "English" courses that have the least priority in their busy schedules.

Universities are using new ways of teaching technical communication courses aimed at overcoming this resistance and involving engineering students in problem-solving communication tasks that have real value for them. Some specific formats in use include courses that involve students

in engineering projects with real clients, courses that are team taught by engineering and technical communications professors and courses that are offered simultaneously with co-op terms.

In designing our communications skills course at Carleton, we assumed that the best way for students to learn how to communicate properly is to practise communication that allows them to achieve discipline-specific goals. We moved away from the traditional approach to teaching technical writing courses, which requires students to pretend that they are working for an imaginary engineering company and to produce decontextualized documents that have no real value for them.

Instead, we ask students to choose

an engineering course they are taking concurrently with the communication course, focus on a specific component of this selected course (a theoretical topic, a solution of a problem, a computer program, an experiment, etc.), and explore this component in depth during the term.²

To complete the course, students are required to write proposals and progress and completion reports on their projects, and to deliver oral presentations. This approach allows us to offer a project-based communication course that helps students both learn more about an engineering subject and practise their communication skills.

COMMUNICATING ONLINE

The division of Computing Services at Carleton University automatically creates an electronic newsgroup (discussion group) for each undergraduate and graduate course. These newsgroups are used in conjunction with common newsreader programs such as Netscape Newsreader or Microsoft Outlook Express, or with an internally set up university network called CHAT (Carleton Hotline for Administration and Teaching).

To help our students to integrate into the engineering student community at Carleton and to provide them with the opportunity to discuss questions related to their course work, we include an electronic newsgroup as an integral component of the course. The newsgroup enables students to receive peer feedback on their topic selection for the communication project, publish drafts of their assignments for peer review, provide online peer feedback, share information about various engineering issues, ask questions, etc. It also gives students the opportunity to practise engineering-related communication in an electronic medium.

In addition to being used as a sounding board for students' ideas and drafts, the newsgroup also allows our students to reflect on the usefulness of the skills acquired in the communication course for their engineering courses and careers. Following are a few comments from students about the course, taken from newsgroup postings:

"The communication course helped me tremendously in my engineering course work [in the following areas]: writing up the progress report and final report for my fourth-year project; learn-

PUTTING IT INTO PRACTICE

The following real-life example illustrates the approach used in Carleton University's technical communication skills course for engineering students.

Responding to the instructor's request to choose an engineering course that presents the most interest and/or the most challenge to students, Amy decides to focus on Mechanics I, a first-year course taken by all engineering students. She writes about her choice to the newsgroup, asking other students and the instructor if it's appropriate and, if so, what aspect of the course may be worth exploring. After receiving feedback from her peers and the instructor and considering several possible topics, she chooses to explore bridge design using the concepts learned in Mechanics I. Through the exchange of newsgroup messages, class discussions and consultations with both the communication and mechanics instructors, she narrows down her focus to the analysis of forces acting on truss bridges.

Amy then drafts and submits a formal proposal to the instructor. After the proposal has been accepted, she proceeds with her project, researching the topic, calculating the forces, continuing to communicate with her peers on the newsgroup, and building a model bridge for class demonstration.

The next assignment she produces is a progress report accompanied by a formal oral presentation. At the end of the term, building upon the feedback received from the peers and the instructor, Amy delivers a major oral presentation and submits a completion report on her project.

While working on the project, Amy continuously uses the newsgroup and in-class peer conferences to make sure she is on the right track and communicating appropriately with her audience—her classmates and the instructor.

The project allows Amy to experience different modes of technical communication as an integral part of an engineering-related activity. By being engaged in a project on an engineering topic that captures her interest, Amy improves her writing and oral skills, and learns the conventions of engineering writing. She also improves her understanding of the concepts taught in the engineering course and expands her knowledge of relevant material beyond what is learned in the classroom.

*The student's name has been changed for the purposes of publication.

ing the 'secrets' of giving effective presentations, which coincidentally were required for the other courses I took; handling group discussions more effectively; and generally, being more conscious of spelling, grammar and flow in written and oral communication."

 "I found that taking the course helped me become more confident when doing presentations for either employers or professors."

 "I currently own a Web design and development company. I write several proposals a week. These proposals are often aimed at different audiences—clients, investors, internal staff.... Information from the communication course has been particularly helpful in this area."

 "I worked at [an engineering company] this summer, where I automated several procedures. Once the code was written and testing was completed, it was my duty to update the procedure manuals.

The concise and precise writing learned in the communication course was very helpful, since the manuals were to be read and used by non-technical operators."

 "I have been working for a telecommunications contractor. With every project we do for [the corporation], we have to write a document called a hardware description. One of the course skills I found useful was the ability to describe something at a level that anyone with an interest in the subject could follow. These documents need to be written in such a way that ... the software people can understand [them], without having a background in hardware design."

Our former students continue to contact us on their own initiative, giving suggestions for the course, bringing us examples of their university and workplace writing, and sharing their experiences as professional communicators. The level of comfort our former students display communicating in the workplace shows that the skills acquired in the course continue to

help them long after the course is over. ♦

Natasha Artemeva is engineering communication program coordinator for Carleton University's School of Linguistics and Applied Language Studies in Ottawa and is vice president of the Canadian Association of Teachers of Technical Writing. She also works as a writing consultant for the Carleton University Writing Consultants, a group that provides writing training to public and private sector organizations.

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