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REFRACTIONS

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Softening the Curriculum

The real world demands more than technical training.

There has long been tension between those who advocate teaching more of the softer side of our profession and those who insist on maintaining a curriculum filled with courses in mathematics, science, and engineering science. On campuses across the country, the latter side usually prevails.

However, engineers in industry who employ our graduates continue to tell us that it is softer skills, especially written and oral communication, that they find lacking in young hires. Knowing how to solve a differential equation and run a computer program is essential, of course, but engineering in the real world involves more than technical stuff.

Engineers are expected to be able to translate modeling and computational results into jargon-free English so their managers and their company's clients can grasp what has been done. The engineer is expected not only to be able to do this in written words on paper or screen but also to be able to do it in spoken words before a design conference or project review and, increasingly, interested citizen groups.

The time spent in college is only a small fraction of the time that most engineers will spend in the workplace, but the habits they develop as students play a large role in whether engineers are effective, successful, and satisfied in their careers. Encouraged to think that communicating in acronyms, equations, and technical specifications is sufficient for an engineer is no service to the engineer or to the profession.

How well or poorly engineers can communicate to a broader audience affects not only their effectiveness as engineers but also their profession's standing in the larger community. If engineers speak at city council meetings, say, as if they were conversing with their colleagues in front of a computer screen, not only is the message likely to be less effective — if it is understood at all — but it is likely to reinforce the stereotype of the profession as a collection of technogeeks.

Increasing movement to make a master's the entry-level degree for engineers seeking employment in the real world provides an opportunity for putting more emphasis on softer skills in the undergraduate curriculum, with the expectation that the harder aspects of engineering will be honed at the graduate level.

The legal and medical professions, which are often held up as paradigms for engineering to emulate if it wishes to gain more respect, certainly follow this model. But in addition, postgraduate training inculcates in lawyers and medical doctors-to-be the idea of what it means to be a professional. Doctors and lawyers certainly have to master their own jargon to practice and to advance in their careers, but they also are taught to act like doctors and lawyers, which means projecting a sense of professionalism that goes beyond what they learn in the classroom and in the

laboratory.

While doctors and lawyers may have to interact more frequently and more directly with those who consult them than engineers may have to with their clients, the most successful engineers can always be expected to be those who have the communications and people skills that enable them to come out of their cubicles and speak to ordinary folk like ordinary men and women.

It is imperative that the engineering curriculum and its adjuncts — student chapters of professional societies and other extracurricular activities — expose students to both the technical and the nontechnical, the harder and the softer sides of the profession. Otherwise, the stereotypes of engineers and engineering will tend to be reinforced by the very graduates who are expected to improve upon the image. They will lack the training necessary to do so.

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