

RON ULSETH

Director of Academics and Research,
Iron Range Engineering

ENABLING STUDENTS TO CREATE REAL-WORLD ENGINEERING SOLUTIONS

When engineering professor Ron Ulseth imagines the “ideal classroom,” he envisions something completely hands-on. From his own experience as a student, he says he has “horror stories” about the traditional model of engineering education: In-class time was spent in lectures, and out-of-class time was spent answering close-ended problem sets on paper. “Go to lecture, do your homework set, take an exam, rinse, repeat,” Ulseth says. “There was very little opportunity to be creative.”

In 2009, this dissatisfaction drove him to help found Iron Range Engineering (IRE), a four-year degree program at Mesabi Range College, developed by Itasca Community College and Minnesota State University, Mankato. This past spring, IRE was recognized as one of the

top 10 emerging engineering programs in the world in a report by the Massachusetts Institute of Technology.

IRE is headquartered in the northern town of Virginia—a major hub for Minnesota’s mining operations. Ulseth envisioned a school where the fundamentals of structural engineering, for example, could be learned by addressing real-life engineering problems that were flummoxing engineers on Minnesota’s Iron Range.

In their junior and senior years, students in the program complete four large, open-ended projects for a company, and about half of them take one semester to apprentice with an engineering firm. This past year, Boswell Energy Center had an air-compressor problem at its Cohasset-based plant. No one at the electric utility company could figure out why their air compressors weren’t working at optimum capacity.

Ulseth dispatched three engineering students to Cohasset to find a solution. After a semester researching large-scale

cooling systems, the students not only presented their findings to the engineers at Boswell with design alterations, they had also learned the fundamentals of thermodynamics and polished their communication skills along the way.

IRE has since been replicated at metro-based Normandale Community College, as Twin Cities Engineering. In 2019, a new model of the program, called the Iron Range Engineering Bell Program, is set to enroll students in four semesters of apprenticeships, taking 150 students a year in addition to the original model’s 25. In this new model, students placed in industries nationwide will earn salaries that exceed the costs of tuition.

Even better, 50-60 percent of Ulseth’s 160 grads so far have found valuable engineering work right in northern Minnesota. IRE has stymied what Ulseth calls a “brain drain” problem, in which the region’s brightest minds are often pulled to universities, and then jobs, outside the region. Not anymore. —J.D.

