



SHAWN SPROUSE

## NEW FACULTY MEMBER

# Perfecting the Undergraduate Experience

If there's one thing Scott Dunning wants prospective students to know, it's that they don't have to choose between their classroom education and access to top researchers. Virginia Tech's ECE department has a dual focus, with faculty members committed to providing a foundation of academic rigor while staying at the forefront of their research domains.

This gives students the value of an incredible education, and the ability to interact with top researchers in the classroom and in the lab, said Dunning, who joined ECE as a collegiate professor and director of the undergraduate program in 2020.

### BEYOND THE RED GRANT

Five years ago, ECE received a National Science Foundation (NSF) Revolutionizing Engineering Departments (RED) Grant to redesign its undergraduate curriculum by rethinking how to teach key concepts and emphasizing problem-based learning. "We want students who have the skills to solve problems using today's technology," says Dunning, "but also understand the fundamentals and theory so they can solve tomorrow's problems."

Project-based learning, which is now integrated throughout the freshman and sophomore ECE courses, enhances students' ability to retain material and adapt to challenges they have never encountered before. From their first ECE classes, students are expected to solve open-ended design challenges that pull from all the knowledge they have acquired in the courses they have taken—or are taking.

The period of the RED Grant is nearly complete, and Dunning was hired to capitalize on the department's momentum. This year, he has helped ECE set up processes to revise and update the undergraduate program, drawing on students' grades and evaluations—as well as comments from employers of recent ECE grads—to ensure the department is constantly tweaking its curriculum to prepare students for tomorrow's engineering challenges.

### PREPARED FOR TOMORROW

"We have 12 different academic majors within the ECE department—I don't know of any other program in the country that can say that," says Dunning. This additional level of specialization ensures that ECE graduates will hit the ground running—they won't need extensive training on the job.

Ideally, employers will report back to the department that its graduates are better prepared thanks to the curriculum redesign, says Dunning. "We have alumni that are part of our Industrial Advisory Committee," he says, "and they are very happy with the changes that we've made, and especially with the majors."

### ALWAYS IMPROVING

Dunning brings more than 25 years of teaching experience to Virginia Tech and considerable administrative experience as well: for thirteen years prior to joining ECE, he served as the director of the University of Maine's School of Engineering Technology.

Dunning has enjoyed a career of refining academic programs, and he approaches

## INTRODUCING

# SCOTT DUNNING

- › Director, University of Maine, School of Engineering Technology, 2007-2020
- › Professor, University of Maine, 1991-2020
- › Former President and Fellow of the Association of Energy Engineers
- › Former Commission Chair and Fellow of ABET
- › Senior Member, IEEE
- › Ph.D., Electrical Engineering, University of Maine, 1999
- › M.S., Electrical and Electronics Engineering, University of Maine, 1991
- › B.S., University of Maine, Electrical and Electronics Engineering, 1988

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—Scott Dunning

his research with the same mentality—always looking for ways to evaluate and refine how things are done. He researches energy efficiency and helps industry partners identify areas for improvement.

For eight years, Dunning led a University of Maine team that performed energy audits. The team would regularly identify ways to use energy waste streams to make a product that impressed clients. “But,” he explains, “they would say, ‘We really need somebody to help us set up our process or develop a prototype, and we don’t have the equipment or the resources to do it.’” So, he and his team led a drive culminating with

a successful \$9 million bond from the state to create a new Advanced Manufacturing Center to meet this need. The 30,000 ft<sup>2</sup> facility showcases the equipment and capability to build prototypes for clients and promote energy efficiency.

### CULTURAL STUDIES AND ENGINEERING EDUCATION

Dunning also has a passion for interactions between culture and technology that he plans to share with ECE students through short study abroad programs. He has led courses examining society and business in Germany in conjunction with Aalen

University. The courses ended with two-week trips to the country and tours of major factories (Porsche, Mercedes, BMW, Zeiss) to study exchanges between culture, labor relations, politics, and technology.

He has also led trips to Peru to study relationships between ancient Incan culture and engineering practices and to show how these historical dynamics continue to influence contemporary Peru. He hopes to continue these study abroad trips to broaden the perspective of Virginia Tech engineering graduates to better prepare them for the global marketplace.

A PHOTO of Machu Picchu in Peru

