



Rick Geisheker, a design engineer for Briggs & Stratton in Milwaukee

Back in 2003, Rick Geisheker, a design engineer for Briggs & Stratton in Milwaukee, didn't mind driving to the University of Wisconsin–Madison once or twice each year to attend seminars on the engine industry. But when Kevin Hoag, the director of continuing engineer education for the College of Engineering, told him about a new opportunity to earn a master's degree in engineering through his personal computer, he knew the university was onto something.

"For a mid-career engineer who wants to brush up his skill set, you have a choice of many, many seminars that are available in our field," Geisheker says. "Rather than take an untold number of these courses, here was a chance to get a degree in a program that would have a lot of structure to it, that would cover not only the basics of engine design, but where engines are headed in the future."

Four years later, Geisheker is one of 10 students, and one of six from Wisconsin-based companies, in the first graduating class of **UW–Madison's Master of Engineering in Engine Systems (MEES)** program.

According to Hoag, who is also the MEES program's former director, the idea grew out of a lunch meeting with UW–Madison faculty and industry professionals. The program's curriculum developed, he says, as companies realized that most of their workers naturally specialized in one of two main areas of engine research: mechanical development or thermal science.

"Every company said the same thing — that they can see their engineers kind of falling into one of those areas," he says. "Well then, the next question that comes in is, [if] you've got a new engine program where you want a chief engineer to lead designing a new engine from a clean sheet of paper, who do you want to lead that program and what kind of expertise do you want? Well, you want somebody who has both of those backgrounds."

While most students specialize in these two areas, Hoag says the holistic nature of the program, as well as the evolving engine industry, allow students with entirely different sets of skills to be a part of the program. For example, one graduating student, Raj Chawla, is a software specialist in engine controls working for MotoTron Corporation in Oshkosh. Improving electronic controls and increasing sustainability, Hoag says, are major areas of advancement for the engine industry that the MEES program incorporates into its curriculum.

"We think of [engines] as a smokestack industry, that engines have been around for 100-plus years," Hoag says. "But it's a complex product, it's a product we're still learning a lot about, and for somebody who is going into mechanical engineering, it's one of the few products that virtually every subject that you learn in mechanical engineering applies to that product."

Faculty expertise

Another important component of the program, he says, is UW–Madison's Engine Research Center (ERC), the largest research program of its kind in the country. "If you're going to offer a whole master's degree program focused on a particular industry, you need the faculty to teach it," Hoag says. "[The ERC] gave us a base of faculty and expertise that we'd need in order to do a master's degree. There's certainly no other university in the U.S. that could provide that level of expertise."

Wayne Pferdehirt, interim director of the MEES program and director of distance degree programs for the College of Engineering, adds that the

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— Wayne Pferdehirt,
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programs, UW–Madison
College of Engineering



Rick Geisheker is a member of the first graduating class of UW–Madison’s Master of Engineering in Engine Systems (MEES) program in May 2007. This degree, uniquely tailored for engine-industry professionals, enabled Geisheker and classmates to achieve their degree primarily online while focusing on the latest standards and future directions in the engine industry. Wisconsin is a national leader in small engine manufacturing.

Photo: Pete Amland, Information and Media Technologies, University of Wisconsin–Milwaukee

Web-based format of the program evolved from the success of another online degree program, the Master of Engineering in Professional Practice, which has won several awards for its distance-learning methods. “It really shatters folks’ perception of what online learning is ... [they] think of online learning as them sitting in front of a computer and watching some video, and, in fact, that’s what a lot of programs are — but it doesn’t have to be that way,” he says.

Geisheker also praises the program’s methods, singling out the introductory course on Web-based learning for preparing students for the demands of on-line learning. Due to the online nature of the program, he says, nothing in his personal or professional life has kept him from class during the past four years.

“I have an adopted daughter from China, and I was able to travel to China with my wife to get our daughter while I was doing coursework,” he says. “Likewise, my business takes me to Japan about twice per year, and I never missed any classwork because anywhere you can connect to the Internet, you can be in the classroom.”

Three-way communication

Students can communicate three ways while taking a course, Geisheker adds. They can discuss what they’re learning in an online discussion forum, schedule conference calls to collaborate on projects or participate in a weekly Web conference brings students together at a time that’s convenient to everyone’s schedules.

“We’re probably in closer communication about the coursework than students who are living on campus,” he says.

Because each student is required to spend two years in the engine industry before entering the MEES program, Hoag says students often end up discussing real-life applications for their coursework that can range from smaller lawn-and-garden engines to larger engines for boats that require a ladder to reach. One student, Mike Mihelich, exemplifies the diversity of applications in his career alone; he has worked on aircraft engines for the U.S. Air Force as well as small and mid-sized four-stroke boat engines for Mercury Marine.

Rolf Reitz, former director of the Engine Research Center and a professor in the MEES program, says this real-world experience provides both an opportunity and a challenge for online learning. While students were able to draw from their work experience in class discussions, designing lessons on the highly technical material for those who had not been in school for many years was a hurdle.

“We had to revise [the material] quite a bit, and at the same time, try not to water it down at all because these are technical courses,” he says. “So that was quite a challenge, and I think we can improve it as we go along.”

Global collaboration

Still, Pferdehirt says, the increasingly global nature of the engine industry means that the MEES program’s Web-based communication is much more of an asset than many realize. “Being able to work at a distance is a need that they have that we can actually help them with,” he says. “Students from both these programs graduate not only with the technical knowledge that they’re looking for, but with an ability to work in a highly collaborative manner with folks who are distributed all across the world, because that’s how we work in the classroom.”

While many companies that have enrolled students in the program are Wisconsin-based, Hoag says the program is becoming more international, with two non-graduating students taking courses from Dominica and India.

“The world’s becoming a smaller place, and the boundaries of Wisconsin can be seen as going worldwide,” he says. “The companies that call Wisconsin home are worldwide companies.”

—by Kristin Czubkowski