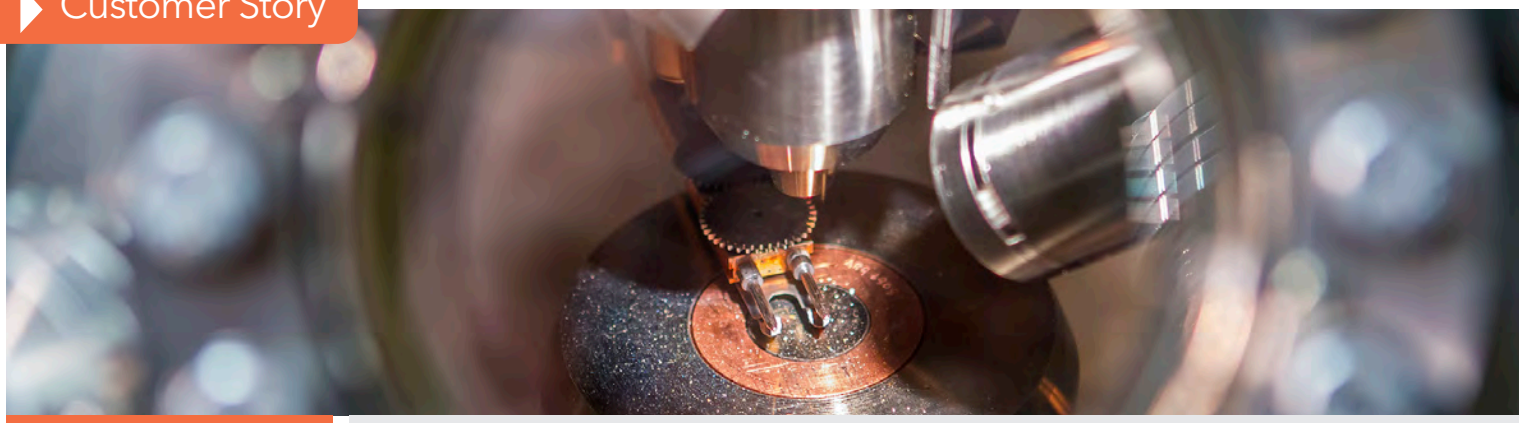
Customer Story



University of Oregon

Challenge

Slews of talented young people graduate each year with bachelor's degrees in physics, chemistry and engineering, but for new graduates, the path to becoming a professional scientist is often unclear.

A launchpad for young scientists propels them to industry careers

The University of Oregon produces industry-ready graduates who can hit the ground running in real-world jobs

When the Master's Industrial Internship Program was launched at the University of Oregon (UO) in 1998, there were few programs designed specifically to facilitate students' transition from academia to employment with applied science companies. "There was an unmet need in industry for master's level scientists," explains Stacey York, PhD, Director of the Master's Industrial Internship Program. The university has long maintained robust corporate partnerships and it was by listening directly to voices from industry that administrators realized there was a growing market for "students who had sector-specific understanding but also an interest in gaining hands-on experience with the type of work being done [in the industrial setting]," York says.

Over the past two decades, the program has developed further in tandem with the evolution of the job market. "The fields of chemistry and physics are really broad," notes York. That's why, in order to meet the demands of the industry, the faculty began to discuss which sub-fields of chemistry or physics would help make UO graduates most employable. "Three different tracks are currently offered with others on the horizon; the photovoltaic and semiconductor device processing track [which was first founded in 1998], polymer science and most recently optics," York says. "We build [our curriculum] around an industry sector that has significant career opportunities."

"In the Master's Industrial Internship Program, we really emphasize experience," says manager of the photovoltaic and semiconductor program Fuding Lin, PhD. "Students get that experience by going through the process together with very close guidance from us. Before joining the program, students don't necessarily know how to do the research and development work… or have the skill and confidence to work independently. Our courses allow them to acquire a more complete skillset directly relevant to what they will need in their careers."

Work-ready graduates must be proficient in DOE and JMP®

Throughout the evolution of the Master's Industrial Internship Program, York, Lin and their colleagues looked to the university's industry partners for feedback on the curriculum: Was it relevant? Were new UO graduates entering the workforce prepared to make an impact? "It was through their feedback, and through my assessment of early career positions [around two years ago], that we decided that a design of experiments (DOE) course using an industry standard software such as JMP was going to give our students an edge," York says. "They're only here for a finite amount of time – and we have a finite amount of resources to work with. So [adding a DOE course] was also a strategic decision: What would have the largest return on investment in terms of students' marketability?"

A key part of the program's experiential philosophy is the belief that, while they are at UO, students should preferably work with the same tools they will later encounter in the industry. So when York and Lin began investigating software needs, they again consulted the program's corporate partners. "Direct feedback from partners showed that JMP was the software they were using," says York. "When I try to understand what an early career would look like for one of our graduates – what the semiconductor scientist or polymer scientist or optical engineer needs –

jmp® Statistical Discovery.™ From SAS.

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>
> Stacey York, PhD, Director of the Master's Industrial Internship Program

you can clearly see a pattern. It typically shows up in the preferred qualifications: JMP (software)-based DOE experience."

Lin now teaches the program's DOE elective, a course that has burgeoned in popularity with a majority of students enrolling each year. But before they get to the statistics, Lin says, students receive a crash course in JMP. "I project my screen whenever we're using JMP in class. That way, I can show them how to do the [exercises assigned to them] and they can follow in realtime with the JMP software installed on their laptop. To make learning statistics more fun, we play with dice and use the data to demonstrate important concepts such as central limit theorem, confidence interval and hypothesis testing. Once they have the basic statistics and principles of DOE down, we then move on to class projects that most people can easily relate to."

Applying new DOE skills to advance the industry standard

Trevor Shear is an alumnus of the Master's Industrial Internship Program, and former intern with the Los Alamos National Laboratory (LANL) in New Mexico. After hearing from industry recruiters that DOE would be an important skillset to master while in graduate school, he enrolled in Lin's course and learned to use JMP. "I never took stats as an undergrad because I wasn't required to. But [once I got to UO] my mindset was that I wanted to make myself as valuable as I possibly could to an employer," Shear recalls.

After previewing the projects he would be working on at LANL, Shear was convinced his experience using JMP for DOE would be beneficial. Upon beginning his internship at LANL, however, Shear learned that his new colleagues were using a different software package. But after reviewing LANL scientists' experimental designs, he quickly pinpointed an opportunity to reduce both cost and experimentation time. "I prepared a DOE in JMP and walked them through what the work could be like," he says.

Shear's use of DOE was so effective that JMP was rolled out across his working group at LANL, and eventually they even upgraded to JMP Pro. "Working with x-ray tomography," Shear explains, "we could actually use JMP's statistical function and obtain a distribution of the void space in high explosives that would previously have taken [my colleagues] three or four days to process. But it took me about a half an hour with JMP. LANL management was really happy with that result."

Economic and academic indicators show the program has widespread impact

There is no question that the Master's Industrial Internship Program has been a success; 98 percent of those students enrolled undertake successful industry or government lab internships, York says. "In the past three years we've worked with 75 plus organizations, from start-ups to Fortune 50 companies to national labs. And the average internship salary this past year was $54,800." Since 2012, she says, students in the program have been funded in the magnitude of $11 million set forth by both industry and government labs. "This metric alone shows the commitment outside of academia to our educational model." And then there is the success of program graduates. York says 90 percent of participants are employed within three months of receiving their master's.

In 2017, the Master's Industrial Internship Program became part of the new Phil and Penny Knight Campus for Accelerating Scientific Impact, a $1 billion initiative announced in 2016, made possible by a $500 million gift from Nike co-founder Phil Knight and his wife, Penny. "It's a pretty monumental time to be at UO," says York. "The Knight Campus is designed to accelerate scientific impact. And our [Master's Industrial Internship] program has been at the heart of that effort all along; using an experiential educational model to get students really prepared to make an impact."

Solution

The Master's Industrial Internship Program is designed to help students launch their careers through a combination of experiential learning and on-the-job internships. Students hone skills valued highly by the industry and master JMP software, an industry favorite.

Results

Competitive internship and 90 percent post-graduation employment rates for graduates are indicative of the widespread positive impact the program is having on individual students and the companies that hire them.

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