



CASE STUDY

Transforming Engineering Education with Cutting-Edge Keysight Labs

Around the world, countries view education in science and engineering as a foundation for technological innovation and economic growth. Undergraduate engineering programs are essential to the success of these initiatives.

Among the majors that are in high demand, current trends put computer science and engineering at the top, with mechanical engineering, electrical, and electronics engineering following close behind. Demand for new engineers spans a broad range of industries, but companies have one crucial aspect in common — they need new-hire engineers who are ready to step in and start contributing immediately.

Meeting this need presents many challenges for engineering departments at public and private universities alike. One of the most difficult challenges is to provide students extensive hands-on experience with the same equipment they will be expected to use in industry.

One public research university in the United States is embracing this challenge, while working to deepen the integration between theory and practice in its College of Engineering. The university also has an overarching goal to attract and retain undergraduate students in its engineering program.



Company:

College of Engineering, public university, United States

Key Issues:

- Develop industry-ready engineers
- Increase engineering student enrollment and retention

Solutions:

- Keysight test instruments, software and teaching/lab courseware
- Keysight RF and Microwave Industry-Ready Student Certification Program

Results:

- 30% increase in student enrollment
- 10-point increase in competitive ranking nationally and internationally
- Enhanced quality of excellence in engineering education
- Confident; better-prepared graduates with industry-ready knowledge, skills, and experience

The Key Issues: Cultivating Industry-Ready Graduates

With the pace that technologies such as 5G, Internet of Things (IoT), and Industry 4.0, are progressing and disrupting existing status quo around the world, demand for “industry-ready” engineering graduates able to hit the ground running on Day 1 has never been more critical. To stay competitive, the university knew it had to deliver a quality of excellence in fulfilling demand for students and supply for industry. With a higher student enrollment goal, university professors had to think of innovative ways to attract new students, retain those who were in the process of earning their degrees, and prepare future graduates for success. Students, on the other hand, gravitated toward studying courses they deemed exciting and purposeful. They needed to see real-world applications for the knowledge they gained while studying sometimes complex and tedious engineering subjects.

In embracing these challenges, the university believed it was imperative to revolutionize the teaching of engineering subjects and upgrade its lab equipment, as well as infrastructure.

The Solution: Outfitting Labs with Professional-Grade Hardware, Software, and Courseware

In the fall of 2018, the university opened a new facility for the College of Engineering dedicated to undergraduate engineering education. To populate the labs, the university was looking for professional-grade test and measurement instruments that would provide its undergraduates with a sufficiently meaningful hands-on experience. Because some of the facility’s labs had a small physical footprint, the university also needed to find the same set of test equipment in a compact form factor.

After considering multiple vendors, the university selected Keysight Technologies’ professional-grade test and measurement instruments rather than low-cost, limited-function alternatives from other vendors. The selected test equipment included 1000X and 6000 Series InfiniiVision oscilloscopes, digital multimeters, power supplies, function generators, and logic analyzers (Figure 1).

The university also partnered with Keysight to integrate industry-led curriculum into its engineering education, ultimately adopting both Keysight’s Internet of Things (IoT) Courseware and RF & Microwave Industry-Ready Student Certification Program. The IoT Courseware provides hands-on learning in designing an IoT device. The RF & Microwave Industry-Ready Student Certification Program teaches students to use PathWave Electronic Design Automation (EDA) software, the industry’s leading software for simulation, measurement, and analysis of communications components and systems. Each certified student acquires technical knowledge, design expertise, and hands-on proficiency with Keysight software and test equipment.

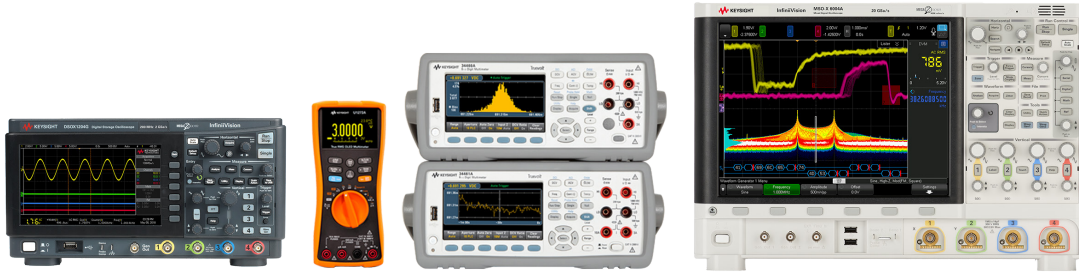


Figure 1. Keysight test and measurement instruments

The Result: Enhanced Quality and Excellence in Engineering Education

Since the inception of the new facility, the university has reported a 30% increase in student enrollment. A survey revealed greater excitement among the professors and undergraduate students thanks to the innovative learning techniques and technologies the university employed in its teaching of engineering subjects. The university's students are now more confident that they have the industry-ready knowledge, skills, and experience they need to succeed in the workplace. And, the university has risen 10 spots in its competitive ranking nationally and internationally.

The university's state-of-the-art labs, coursework, and programs are making the College of Engineering even more competitive in the national and international race to attract and retain well-rounded, industry-ready undergraduate engineering students.

Going Forward

Technology is constantly evolving, and the engineering faculty at the public research university is eager to acquire new equipment, software, and courseware to keep the engineering program relevant to future students and their potential employers. From digital communications to IoT, team-based projects and active-learning studios, the College of Engineering is poised to lead the way in molding future engineers. In support of this trajectory, Keysight is committed to continue with innovation that will enable researchers, educators, and students.

Related Information

- RF and Microwave Industry-Ready Student Certification Program
- IoT Fundamentals Courseware
- IoT Systems Design Courseware
- IoT Wireless Communications
- IoT Sensors and Power Management

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