Learning to fly

Students enrolled in Mohawk Valley Community College's two-year Remotely Piloted Aircraft Systems Program have the opportunity to fly the Microdrones md-4 1000 as part of their studies, giving them valuable experience in the field.

by Renee Knight

A demonstration of the Microdrones md-4 1000 for new students **(left)** and Professor Bill Judycki working with the local sheriff's department **(right).**

Leaders at Mohawk Valley Community College (MVCC) are always looking for ways to keep the New York based engineering school on the leading edge, and to put their students in a position to land quality jobs after graduation. That's why they decided to add a two-year Remotely Piloted Aircraft Systems (RPAS) Program to their curriculum in 2015.

Professor Bill Judycki, an electrical engineer and a licensed pilot, was tasked with developing and leading the program, which he said is one of only four in the country that allows students to design, build, test, program, fly and apply RPAS technology. Students have access to a fabrication lab modeled after MIT's, a top-notch flight simulator room, GIS classes, and a variety of local companies and organizations that are working toward moving RPAS technology forward.

Giving students the opportunity to fly a drone in the field is one of the most important elements of the program, and for it to be successful, Judycki knew he needed

to invest in a modular, reliable system that's easy for new operators to use. It didn't take long for him to select the Microdrones md-4 1000 as the program's solution. Not only is the company's U.S. office only 15 minutes from campus, the system comes with all the features Judycki wanted for his students, including easily swappable payloads, durability, long flight times and high accuracy.

"Field work is extremely important," Judycki said, "and I can't think of a better aircraft for my students to fly than the md-4 1000."

Why Microdrones

When looking for a drone, Judycki wanted a solution the students could use for a variety of missions including mapping, surveillance and crop monitoring. He knew buying one system for every application would be too cumbersome, as well as lead to maintenance and integration headaches.

"I have one platform that can perform multiple applications, and with the modular approach I can snap out one payload, snap in another and we're off to another application," he said. "That's the best part about it. It's easy to program and easy to fly. The learning curve is very short with this copter."

Different sensors can be swapped in and out of the system in less than five minutes, Judycki said. The first package the students use allows them to create accurate high-resolution maps, and the second incorporates LiDAR for accurate 3-D mapping. Students have created "some really high-tech maps" for local colleges and a variety of agencies, Judycki said, including fire departments, police departments and Homeland Security.

"We can shoot the high-res map with the first package then switch to LiDAR to create a 3-D point cloud," he said. "We can then take the first map and throw it over the point cloud to get a nice 3-D model."

MVCC is located in a rural area, which means there are plenty of ranches and farms for the drone to fly over, Judycki said. The third package, which features a MicaSense multispectral camera, can provide local farmers with valuable information about crop health. The final package is used for surveillance and inspection, and comes with a thermal camera that features high-power zoom capabilities.

Not only does Microdrones make it easy to change out payloads on the md-4 1000, the company also offers a level of support Judycki hasn't found anywhere else.

"Our team is absolutely positively ecstatic about the great support Microdrones offers," he said. "I've bought a lot of different aircraft from different vendors and most of the time they sell you stuff then say 'bye, don't bother me.' Microdrones has gone way above and beyond with their support and are great to deal with. They're always just a phone call away. They also provide excellent training."

The Future

The school's RPAS program is in its third year and already has one class of graduates. That class consisted of about 15 students, but that is a number Judycki expects to grow as deploying drones for commercial applications becomes more and more popular, opening up a variety of job opportunities.

"I'm seeing an awful lot of interest," he said. "There's outreach to be an explosion. If it doesn't happen this year it will be next year. The applications are unlimited and there's quite a bit of excitement about the technology."

MVCC is even working with the nearby Syracuse City School District through the Syracuse Pathways to Technology (P-TECH) program, which Judycki describes as a "direct pipeline" to MVCC's RPAS program that gives students a head start on their degree.

As MVCC's program expands and the technology behind drones evolves, the team will continually make updates to the curriculum to ensure students receive the best education and hands-on training possible. They'll infuse as much new technology into the program as they can, Judycki said, and will continue to keep up with the latest advancements in this growing new job market.

"It's a great emerging technology, and I tell everybody one of these days we're going to be flying these things back and forth to work," he said. "They certainly make life very easy and they're a hot topic with pretty much everybody we talk to. We try to stay on the leading edge, and that's what led us to Microdrones. We have yet to find anything that comes close to the quality, durability and of course the performance of what we have with the md-4 1000." ◆

md-4 1000 features

- Up to 45 minutes of flight time, depending on conditions and payload
- The durability to withstand harsh environments, including strong winds, magnetic fields, high temperatures, voltage and humidity
- The ability to carry a payload of up to 2.7 lbs.
- The ability to carry a variety of sensors that can be quickly and easily swapped out when it's time to switch applications

The system is also available with direct georeferencing (DG), a technology that provides cost savings and enables access when images must be georeferenced in challenging locations.