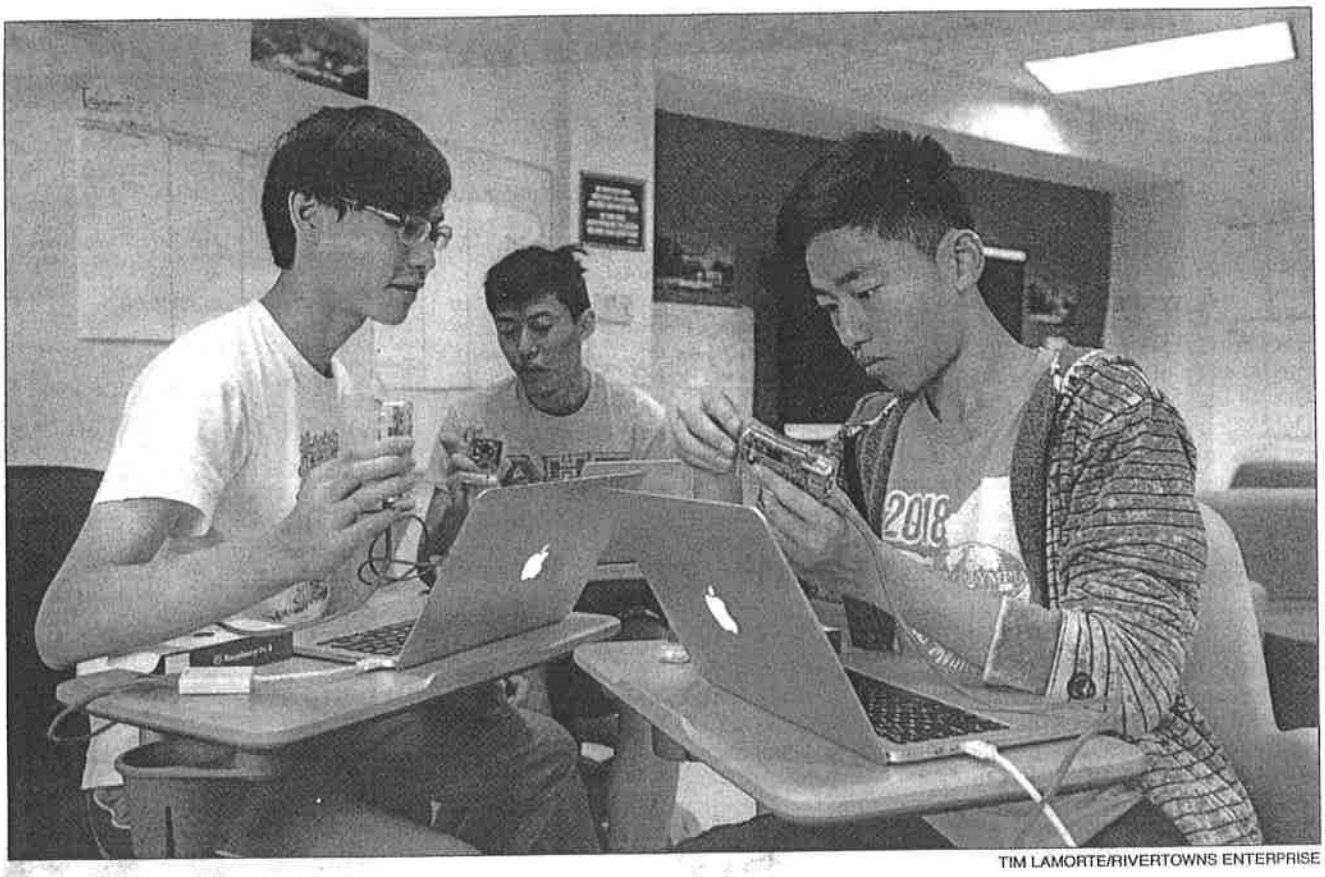

TIM LAMORTE/RIVERTOWNS ENTERPRISE

Yu-Chen Lung, Liam Shen, and Patrick Sheng connect Raspberry Pi mini computers to laptops.

New class unlocks cybersecurity know-how

By Kris DiLorenzo

In Ardsley High School's new cybersecurity class, 14 students — six sophomores, three juniors, and five seniors — are learning about the risks and security measures involved in communicating through cyberspace.

The students also earn three credits (for which they each pay $336) from Syracuse University's School of Information Studies, transferrable to any college that accepts them.

In a recent interview, computer science teacher Brandon Milonovich, who is in his fourth year teaching at AHS, cited the school's reasons for offering such a cutting-edge class.

"The school wants courses that are interesting to kids, and the number of jobs out there in cybersecurity are critically important," he said. "You see in the news every week about hacks and information data leaks. Even if kids don't go on to study cyberspace as a field, it's important to have an aware group of citizens, and know ways we can protect ourselves."

Milonovich knew from his own experience that students would enjoy

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Cybersecurity

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the subject. As a student at Broadalbin-Perth High School in upstate New York, he participated in the Syracuse University program, then went for training at Syracuse as he was developing the AHS course.

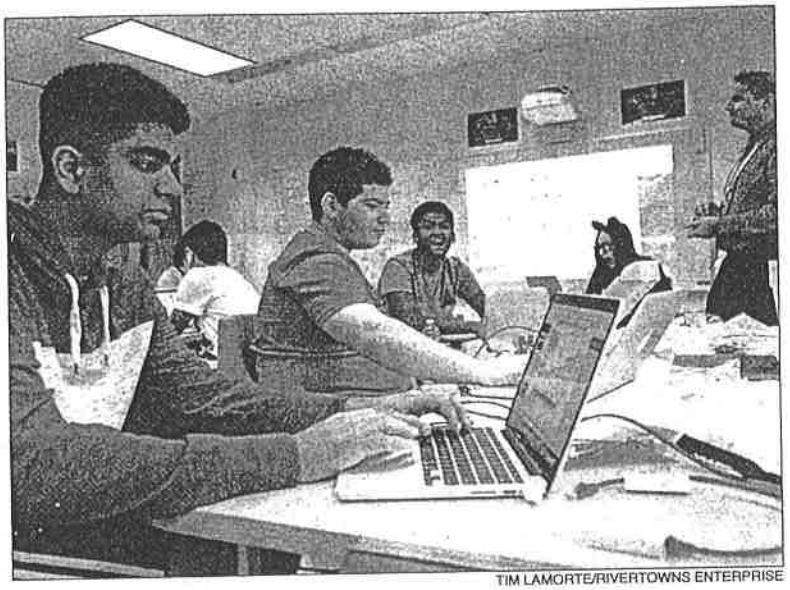
The cybersecurity class deals with practical issues: managing passwords, encrypting information over the Internet, keeping wireless networks secure, avoiding scamming, and dealing with malware attacks and phishing.

Working in teams, the students solve problems using the technology industry's "scrum" technique of project management, organizing their workflow, and the timing of tasks to reach their goals.

They're also learning the hacker's mindset, "thinking about how your adversary would think," Milonovich explained. "There are two types of hackers: 'black hats' and 'white hats.' Black hats are trying to sneak into your WiFi, get into servers, get your passwords — all those illegal things. White hats are hacking for good."

He gave an example of the latter. "Companies hire 'penetration testers' to try to get into their systems to see where the vulnerabilities are, and report back to the company. They work on solutions: a policy or a new style of encryption to help combat them. It's a matter of who can figure out the vulnerabilities first: the bad guys or the good guys."

The students are also learning the significance of cybersecurity in the world, through researching current events and discussing issues such as the precedent-setting 2013 hacking of Yahoo by two Russian intelligence officers and two hired Russian hackers, in which 3 billion customer names, e-mail addresses, and passwords were exposed. On a smaller scale, local public networks are also at risk.



TIM LAMORTE/RIVERTOWNS ENTERPRISE

Shreyesh Sanchala, Alex Shapiro, Muaaz Siddiqui, Maya Cohen, and teacher Brandon Milonovich

"When you go to Starbucks and sign into their WiFi, someone could be 'duping' the Starbucks network and scamming people," Milonovich said. "For example, I could be sitting outside in my car with a wireless router that has a more powerful signal than theirs, and can broadcast a sham signal. They'll connect with my device thinking it's the Starbucks network. I'd have access to anything that's unencrypted, and there's really not much Starbucks can do about that. It's kind of an impossible problem with a lot of places."

To make sure his students finish the course with a "moral compass" and don't don black hats, Milonovich stresses ethics, which he considers one of the key aspects of the class. He recognizes that curiosity might inadvertently lead someone into potentially harmful actions. "It's easy to end up on the dark side without them even realizing they've gotten to that point," he asserted.

He'll also touch on the topic of careers. Because of the burgeoning need for cybersecurity experts in government and the private sector, some major institutions have created cybersecurity programs and degrees. For example, New York University Law School, in conjunction with NYU's Tandon School of Engineering, offers a master's degree in cybersecurity risk and strategy.

More than 70 colleges, including NYU, participate in the U.S. Office of Personnel Management (OPM) CyberCorps: Scholarship for Service program, which may provide full tuition and fees plus a $22,500 annual stipend for undergraduates, and a $34,000 stipend for graduate students, depending on the school.

As of press time, a random sampling of jobsite listings for non-governmental institutions offering cybersecurity jobs included Google, Microsoft, the University of Baltimore, Deloitte and Ernst & Young (two of the world's four biggest accounting firms), Symantec (cybersecurity software), Unisys (global information technology services and software), and Kimberly-Clark (paper-based consumer products).

Many students enrolled in the class for its long-range benefits.

Sophomore Yu-Chen Lung said, "I think that the addition of a cybersecurity course in our school is a step in the right direction. As the generations who are in high school right now are going to grow up in an environment where more things in their daily lives will start to get connected to the 'internet of things,' digitally we need to be able to protect ourselves, or at least understand the risks associated with more connectivity."

Zachary Arce, a junior, plans to pursue information security as a career. "The intricacies of defending a network from breaching makes me wonder about the concept as a whole. I'm excited to learn how it all works."

Milonovich said that most of his students are interested in computer science in general, but this course doesn't focus on programming. Students participate in activities such as "capture the flag" competitions (digital versions of the childhood game), puzzles requiring them to work toward a goal, and problem-solving using encryption and algorithms.

Using "scrum," students have created lists of tasks to be done, tasks currently underway, and tasks completed, and lists of meetings and time frames. Milonovich described the result: "There are papers hung up all around my room. It's cool to see kids take ownership of their learning and how to get things done."