

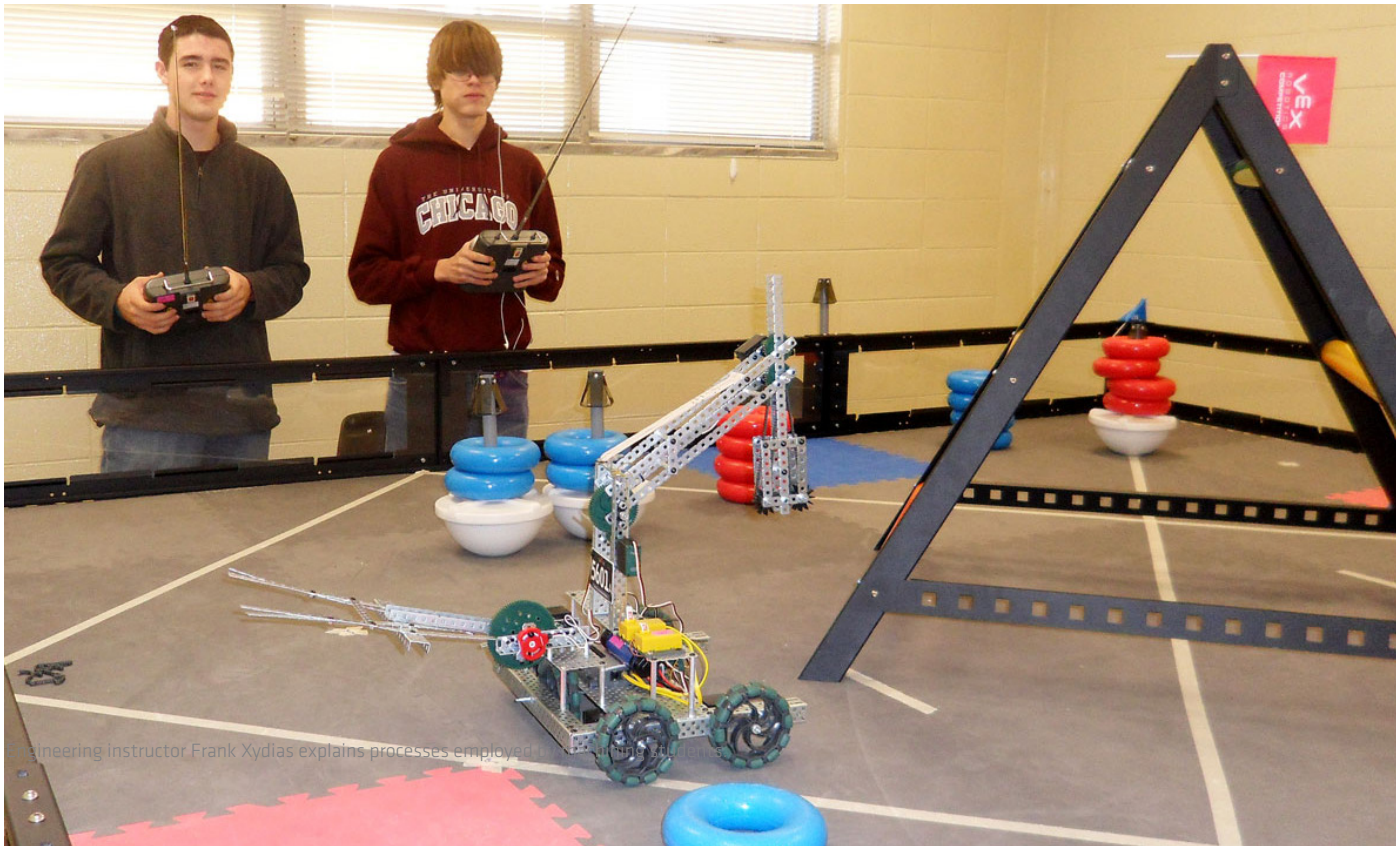
# CARROLLTON HIGH SCHOOL



An innovative STEM class harnesses collaboration to inspire students

# CARROLLTON HIGH SCHOOL

Carrollton High School in Georgia integrates innovative teaching strategies, technology and professional development in a truly pioneering STEM program.



The call for improving science, technology, engineering and mathematics (STEM) education has challenged educators to produce innovative solutions. Funding for new programs is essential, yet often times, finding effective ways to implement those funds has been even more challenging. Real innovation is required, as well as ongoing support for the teachers in the front lines of the battle to improve student outcomes. One school in Georgia has integrated all three elements – funding, innovation and teacher training – into an effective STEM program.

Carrollton High School in Georgia received American Recovery and Reinvestment Act funding to improve and enhance their offerings in STEM education. With a vision to deliver STEM education in a way that combines academics with application, Carrollton formed a program embracing collaboration across the STEM disciplines of science, technology, engineering and mathematics. The program brings together three teachers – a math teacher, a science teacher and an engineering teacher – together in one class to join forces on development and delivery of STEM instruction.

The CHS STEM class, started in Fall of 2010, seeks to give students a taste of engineering, while offering an elective credit. For those that take to it the STEM class can be a pathway to an engineering career

“We thought it would be great to have home grown engineers,” explains Kasey Austin, an Engineering teacher recruited to be one of the instructors in the STEM class. “We target the high flying students in hopes that we get them hooked on engineering early, they go to college to further their education and come back to Carrollton and go to work in the community.”

Joining Austin in the classroom are Science instructor Kristie Bradford-Hunt, and Math teacher Will Melton.

“We create stuff together, communicate it to students together, grade together,” says Melton.

“Three is better than one!” adds Austin, “By bringing all the disciplines together we’re able to look at one single project at the same time and bring in principles from science, principles from math, and make sure all those core principles are included.”

“If I had to do it myself, I might not be so concerned with the math and science, Kristie might not be so concerned with the engineering and technology, Will might not be so concerned with science and technology. We all put our heads together and the different perspectives make it more versatile for the students. They get more out of it because we have different backgrounds and share the planning time.”

With the funding in place and collaboration as the guiding concept, the next challenge was to find curriculum and lab equipment that would meet their goals.

“We decided our focus would be on engineering,” explains Austin.

“We had to have something for the first year,” says Melton. “We had CAD that directly applies to engineering, but we had literally nothing else to go with. So we started from scratch as far as that goes.”



**LEARN MORE ABOUT CHS STEM PROGRAM AT SCHOOLTUBE!**

<http://bit.ly/YhyK02>

The teachers took note of the success Carrollton students had in afterschool ROV (remotely operated vehicle) competitions.

“We had the ROV team, and they had been successful, and because of the type of companies that surrounded our community we narrowed it down to the manufacturing side of that,” says Austin.

“Curriculum was a huge thing we were looking for - and training - professional development,” says Bradford-Hunt.

After searching through STEM offerings on the market, Carrollton High selected intelitek’s Engineering Program, centered on the LearnMate® learning management system and featuring VEX® robotics. This provided the content framework for the entire fall semester. Looking forward to spring, they will implement CAD/CAM/CNC and industrial robotic courses.

A vital element to intelitek’s program was the training and support that came with the program. The CHS team knew that this would be essential to their success.

“We didn’t want to go buy a piece of equipment and have it just sit there because no one knows how to use it,” says Austin.

“We had a CAD teacher, a math teacher, a science teacher,” explains Melton. “We didn’t have any connections on how to teach this exact content.”

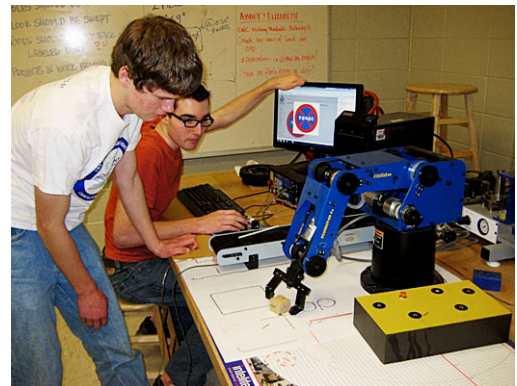
After attending factory training at intelitek’s headquarters in Manchester, NH, the teachers felt fully equipped to put the program to work.

“We were a bit overwhelmed by all we needed to accomplish in creating a brand new engineering program,” says Austin. “After attending the training we were much less overwhelmed. The training was just spot on, exactly what we were going to do back in the classroom. We actually got to build a robot! That was really helpful to starting our program.”



“By bringing all the disciplines together we’re able to look at one project and bring in principles from science, math, and all those core principles are included.”

**KASEY AUSTIN, ENGINEERING TEACHER**



“LearnMate allows the kids to be self paced. We can come in and help them when they need it”

**KRISTIE BRADFORD-HUNT  
SCIENCE INSTRUCTOR**

"We felt pretty confident and continue to feel more and more confident the more we learn from the training we get," adds Melton.

"The professional development is huge. This training was hands on, the people know what they are doing. The customer service is another huge part of it for us, because we can pick up the phone and get somebody – it's been extremely helpful," says Bradford-Hunt.

The online engineering content also proved to be a great asset for the first year of such an innovative program. With core concepts delivered online, followed by leveled activities using the VEX® robotics hardware to put those concepts to use, the Robotics Engineering Curriculum provided the flexibility they would need in the maiden year.

"LearnMate was huge for the first year," says Melton. "It's flexible enough that if we need to slow something down or speed something up or do something different compared to what's in LearnMate, we could easily pull that together based on what they had already been taught."

"LearnMate allows the kids to be self paced," Bradford-Hunt adds. "We can come in and help them when they need it, when they have questions or we see they aren't doing exactly what they are supposed to be doing."

Austin notes another advantage to the online delivery of the content: "The interface prepares them for the next step because you see a lot of that in college – it's all online. You navigate it yourself, talk to your peers through the email portal – it's nice they can get a taste of that before they leave high school."

Will Melton is happy that the program's project-based approach helps students to realize an important element of education: application.

"We have found that even though almost all the kids are top of their class, really smart, and making good grades, sometimes they don't have a way to apply that to the engineering context," Melton says. "It's going to inspire kids to move towards engineering – they will get to use stuff for the first time that they didn't know they had within them. This is a new opportunity that they never would have had: to see that direct application with the hands-on stuff we do every day."

"We were also able to target a lot of girls," says Austin. "With the robotics there is that design element that can hook them."

After the first semester, the STEM teachers are impressed with the student outcomes.

"We finished our first semester with 21 kids who went through the program. Those students were able to shine," says Melton. "At the end of the semester the culminating project was to build a robot that could compete in the VEX competition. The kids built some really good competitive robots that are ready to go. They put together some awesome stuff. We were impressed with what they did."

As the program develops, the teachers are setting their sights on expanded activities. They hope to move beyond the classroom competitions and compete in local competitions including TSA®, SkillsUSA®, VEX® and other events sponsored by local high schools.

"Going even further, our goal is to implement STEM in K-12 so they get it early and get a taste of it at all levels," says Austin.

With the first semester behind them, the STEM class teachers agree that this collaborative model has improved student outcomes exponentially.

"Collaboration adds a lot to what this class has become," says Bradford-Hunt.

"It helped us get a lot further than we would have gotten on our own," says Melton. "It definitely was a huge help to actually integrating all the parts of STEM."

Such inspiring early results show what can be accomplished by collaborative efforts across all interests. Adequate funding, innovative vision and focused professional development can combine to produce new opportunities for students, opening up pathways to successful educational experiences.



**WILL MELTON  
MATH TEACHER**

"The first semester project was to build a robot that could compete in the VEX competition. The kids built some good competitive robots. They put together some awesome stuff."

#### RECOGNITION OF SUCCESS

Since the CHS STEM program launched, the class has received much recognition including the following:



- AP STEM SCHOOL
- AP STEM ACHIEVEMENT SCHOOL
- TECHNOLOGY ASSOCIATION OF GEORGIA STEM FINALIST FOR HIGH SCHOOL PROGRAMS
- TECHNOLOGY ASSOCIATION OF GEORGIA STEM FINALIST FOR PUBLIC-PRIVATE PARTNERSHIPS
- LETTER OF COMMENDATION FROM GEORGIA GOV. NATHAN DEAL
- RECOGNITION AT THE GEORGIA STATE BOARD OF EDUCATION FOR OUTSTANDING STEM PROGRAM.
- RECOGNITION AT THE GEORGIA ASSOCIATION FOR CAREER AND TECHNICAL EDUCATION SUMMER LEADERSHIP CONFERENCE
- TITLE II D STEM LAB GRANT RECIPIENT

