

Teacher: Dustin Cogar

Course: Energy and Power

School: Lewis County High School, Weston, West Virginia

Principal: Tim Derico

Students Get a ‘Lift’ From a Hydraulics Project

Students at Lewis County High School (LCHS) in West Virginia can see clearly into the future, and the picture is rosy. These students are following a new Energy and Power pathway leading to further education and high-tech careers. “They will be able to find good jobs in engineering technology without leaving the state,” said teacher Dustin Cogar.

Cogar is piloting the first of four full-year courses in Energy and Power in 2013-14 at LCHS, a school of 730 students in Weston. These courses were developed by SREB and West Virginia as part of the Advanced Career (AC) curricula that are growing rapidly in nine states and will be offered to every state in the future. While LCHS delivers Energy and Power as a yearlong course, other schools may offer the AC courses in a semester format. Leading industry representatives and educators are working with SREB to identify high-demand career fields and match current and future opportunities in the nine states.

“We saw a lot of people going into the gas and oil business in our state and wanted our students to be prepared for those fields,” Cogar said. “Our school needed to add a program of study dealing with energy and power, and the AC curriculum is the right thing at the right time.”

Summer Training

Cogar has been a career-technical faculty member at LCHS for seven years, teaching cabinet making, construction, fundamentals of drafting, transportation systems and foundations of engineering. He received two weeks of summer training on the first Energy and Power course and will continue to go each summer until all four courses are offered at LCHS.



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“I see the AC foundational course taking the place of the foundations of engineering course we have been teaching,” Cogar said. “AC is much more in-depth and project-based.”

Each of the four full-year Energy and Power courses engages students in six hands-on projects. Cogar described one project that was assigned in fall 2013: Students designed a hydraulic lift system to move coal from ground level to a conveyor belt to feed it to a final destination such as burning or stockpiling. The goal was to reduce manpower by using hydraulics.

The class of 16 students is balanced between freshmen and sophomores. "I put the freshmen on teams with sophomores, who would know how to use higher-level mathematics and science skills," Cogar said.

Teams Take Off With Research



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The teams took off with their research for the project, using the Internet as well as traditional research sources. "Students found that there are easier ways to locate information," Cogar said.

Instead of lecturing and going through a text, Cogar gave prompts and students looked up the information. "They answered the prompts in their own words and cited the sources," he said.

When students were ready to build and test their model hydraulic systems, they discovered there are many variables. "If they changed one thing, the system would do something different," Cogar said. "They liked being able to manipulate the outcome."

Presenting Their Work

The next steps were to write a formal design brief and present the project to a group of professionals from energy and power. Students made presentations of their work and answered questions from the expert panel as they learned to think on their feet.

"If you do six projects a year for four years in Energy and Power, that will be 24 opportunities for you to meet and connect with experts in the engineering technology field before you graduate from high school," Cogar told the students in encouraging them to consider the importance of the projects and the presentations to their lives in the future.

The students clearly want to be in the course and in the engineering field. They tell their friends about it and have helped put up posters of their work in the school. "Their math skills were pretty good, but they needed help with the written content," Cogar said. An English/language arts teacher briefed on the AC curriculum became his "support system" to improve students' reading and writing skills. They read other design briefs from the field to gain extra literacy experiences.

Other LCHS teachers have given positive feedback. Science teachers see their students using Ohm's Law and other science knowledge in real-life projects. Mathematics teachers know that what they are teaching is being put to work in another classroom.

Cogar's biggest challenge was to adjust to being a facilitator rather than a class lecturer. "Students take responsibility for the projects and move ahead," he said. "Sometimes I wonder if I'm on top of what they are doing and need to hold them in check, but then I realize, 'Wow, they got it!'"

For information on AC projects at Lewis County High School, contact Dustin Cogar at dcogar@access.k12.wv.us.

For information on adopting this AC curriculum or others available in fall 2014, visit sreb.org/AC or contact: Gene Bottoms, SREB Senior Vice President at (404) 875-9211 or gene.bottoms@sreb.org, Marna Young at marna.young@sreb.org or Jim Berto at james.berto@sreb.org.