

Design Engineering students put concepts into practice

BY MATTHEW FOX 12-27-06, Paso Robles Press



By the time students reach the Design Engineering course in the Endeavour Academy program they've learned the concepts and they're ready to put them into practice.

"This is the capstone class, the third in a sequence," said Endeavour Academy instructor Steve Kliewer.

"They've had experience with general engineer techniques, physics and electronics. At this level we're more into applying it."

This year's class is comprised of four students—Anna Chang, Natalina DeFusco, Tye Barba and

David Hood—all juniors. Though Kliewer said the group is smaller than it's been in past years, the students believe that's one of the best aspects of this year's class.

"We're a small class, but all four of us have known each other for a long time," DeFusco said. "We're a tightly knit group."

In fact, they don't really see it as a class at all.

"We tell people we're a team, not a class," Chang said. "We consider ourselves a team because we all work together on everything."

In year's past, the Design Engineering team has come up with projects such as the Aerial Imaging Remote Sensing System (A.I.R.S.S.), which was designed to allow agriculturalists to use multispectral imaging to analyze the needs of their fields.

This year's team first focused on an electronics kit they're hoping to manufacture for sale. They've worked on a balloon for the Endeavour Academy balloon launch that was held Dec. 21 at PRHS and following the break they'll begin working on a project involving a cosmic ray detector system that they can launch on a hot air balloon for the Balloon Fest in June.

"This is not just about engineering, it's about problem solving in general," Kliewer said. "These kids are getting an opportunity to develop their problem solving techniques."

The students choose their own projects and their own topics to pursue which, at times, has even spurred the learning process for Kliewer.

"Last year I had to learn all about light and color and how digital cameras work because that was a big issue," he said. "So it's challenging for me but that's the good part. That's why I teach, because I like to learn."

That love of learning is something Kliewer has in common with the students in his Design Engineering class.

"This isn't like a normal class where you sit down and the teacher teaches you things," Chang said. "We get to break into a group and work as a team. It's more independent; homework doesn't just come from a text book. It's one of the more challenging classes I've ever had and one of the most fun."

A lot of the projects the team works on requires a great deal of time spent hammering out designs and finishing projects together outside of class as well.

"There's always something to do," DeFusco said. "The homework for this class is

different than any other kind of homework I've ever had to do. You really have to think ahead and plan things out."

Though the projects are challenging and, at times, frustrating, the students have enjoyed the work.

"This is probably one of the most fun classes I've ever had," Barba said.

"You know you love doing something when it makes you feel every single emotion at once but you still love doing it," DeFusco said. "Frustration is all part of the process."

That dedication to the learning process is part of what makes it an enjoyable group to work with.

"They're always fun," Kliewer said. "They do a good job and they're always excited about what they're doing."

For more information about the Endeavour Program, visit www.pasoschools.org/endeavour.

Endeavour Academy holds balloon launch

BY JILL IVIE 12-27-06, Paso Robles Press



Endeavour Academy students from Paso Robles High School spent three weeks of intensive work focused on soaring off into the sky during their Hot Air Balloon Engineering Project, transforming tissue paper into a competitive flying aircraft.

Student groups spent weeks designing their hot air balloons, made entirely of tissue paper and tape, to compete for extra credit in one of four categories: highest flight, longest time aloft, most creative and most colorful design.

Teams from the Introduction to Engineering class had to safely fly and recover one egg. Team MALT won the longest time aloft category with their balloon that sailed for 50 seconds. Team Al Gore won the highest flight with a height of 13 meters. Noolab won the most creative/innovative award and Team La Migra won the most colorful design award for the Introduction to Engineering class.

"We put in a lot of extra effort," said Jasmine Galvez of Team La Migra. "The calculations were the hardest part of the project."

"We focused a lot on just making sure the holes were all covered," said La Migra teammate Wes Levonduslei.

Groups from the Mechatronics class were asked to design a similar project of tissue paper and tape capable of carrying two eggs into the air and deliver them safely to the ground. Team A.O.K.'s design won for the greatest time aloft with a flight time of 57 seconds. Team Windom had the highest flight run with a total of 13 meters. Team Jim won the most creative/innovative design and Team A.G. E. took the most colorful design prize.

"The goal of the design is to make sure the net upward forces is greater than 0 to get it up into the air," said Eli

Schoennauer.

Team The World, from the Engineering Design class, won the grand prize for their telemetered altitude system, recording a time aloft of 43 seconds and a flight height of 23 meters. Groups from the design class were asked to test a form of telemetry to report flight data with their projects. "This project allows students to choose their own level of creativity and challenge," said Steve Kliewer, instructor for the Endeavour Academy at Paso Robles High School. "This is a deceptively simple problem. Anyone can make tissue paper fly. However, designing and documenting an optimal solution is a much more challenging and rewarding project." At the close of the engineering projects, 17 tissue paper balloons were launched into the sky over the Bearcat track. The balloon launch was the culminating event of weeks of work for students working through the design process. Prior to the extra credit competition, student groups had to analyze the problem and potential solutions, propose solutions, document the design, get approval on their design package, build the design project, document and verify it just to ready for last week's competition.

Soaring: Designed to take flight 📷

By Leah Etling

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Tribune photo by David Middlecamp

Paso Robles High School teacher Steve Kliwer uses an instrument to measure the temperature of a hot air balloon before a flight at Paso Robles High School.

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With a propane camp stove doubling as a launch pad, squares of tissue paper glued together to form balloons and eggs as payload, about 50 Paso Robles High School engineering students were ready for takeoff Thursday.

The hands-on science project was the annual hot-air-balloon engineering experiment, in which Endeavour Academy students launch makeshift balloons on the school's soccer field.

After a last-minute rush to finish their projects — some students said they stayed up until midnight Wednesday to perfect their balloons — the payoff was in watching them take flight.

Cheers and shouts heralded each launch, a few of which were thwarted by slightly windy conditions.

But when the breeze stopped, some of the balloons went up to 60 feet over the field, with the teams of students who created them running underneath to catch them as they floated back down.

Teacher Steve Kliwer, whose three engineering classes participated in the project, said the purpose of the unusual activity is to practice engineering design.

His students said they fulfilled that requirement by spending hours on the drawings and calculations necessary to create their balloons, which were anywhere from 3 feet to 10 feet high.

"This is a deceptively simple problem. Anyone can make tissue paper fly. However, designing and documenting an optimal solution is a much more challenging and rewarding project," Kliewer said.

Sophomore Zach Nagengast and freshmen Isaac Andrade and Luis Espinoza said their math problems were especially time-consuming.

"We found the lifting force by using the lift hot air gives it versus the weight of the balloon," Andrade said. They also tested their construction by using a household hair dryer to inflate it.

Sophomore Andrea Carroll said that her favorite part was watching A-OK, the balloon she worked on with Octavio Garcia and Ki Park, take flight.

"It is so much fun to see your work go up in the air and stay there," Carroll said. Her team said they drew from what had worked last year to improve this year's balloon.

Students were asked to meet varying challenge levels. First-year students were required to carry just one egg as payload. The advanced design engineering students had electronic cargo that included a wireless elevation detector.

They competed to see who would have the highest flight and longest time aloft and who had the most creative and most colorful balloon.

The balloon christened by Brent Savage, Kevin Hahn and Ian Dingeler as AI Gore had possibly the most unusual name.

But the boys weren't alluding to using alternative energy to fly as the former vice president's new film "An Inconvenient Truth" might suggest. They picked the name because they were stumped.

"We couldn't decide what to name it," Ian explained. So they borrowed from the "gores," which are the triangular shaped patterns used to make the balloons.

AI Gore was one of the highest fliers of the day, much to the team's delight.



Tribune photo by David Middlecamp

Anna Chang exults at the liftoff of her group's tissue paper hot air balloon. It carried a electronic wireless payload to a height of 59 feet at Paso Robles High School.