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## Students build, compete with race car

By **Jeff Samoray**, OU Web Writer

Mechanical, electrical and computer engineering students from Oakland University recently experienced the thrill of designing, building and racing their own Formula One style race car in the **2002 Formula Society of Automotive Engineers Competition** May 15-19 at the Pontiac Silverdome.

Held annually since 1981, the Formula SAE is considered one of the top student engineering competitions of its kind in the world. This year's event attracted over 1,000 student participants representing 149 teams and 97 countries, including Japan, Puerto Rico, South Korea, Mexico, Venezuela, Germany, Australia and the United Kingdom. Of the participating teams, 112 brought vehicles to compete in three different categories: static inspection and engineering design, solo performance, and high-performance track endurance.

OU won the EDS Outstanding Sportsmanship Award and took 51st in the acceleration event and 70th in the autocross and skid-pad events. The award earned the team \$1,000, which will be used to fund next year's vehicle. Cornell University finished first for the second consecutive year. The University of Wisconsin-Madison finished second and Georgia Tech came in third.

"I was very proud of the efforts of our students," said Brian Sangeorzan, associate professor of engineering and computer science and faculty adviser to the Oakland University SAE chapter, the group that built the vehicle. "This is the most competitive student design anywhere in the world and to just make it to the competition with a running car is an accomplishment."

About 20 students from OU's SAE chapter began building their rear-wheel drive, single-seat race car nearly two years ago, said Brad Sears, a senior electrical engineering major and OU SAE president.

"Our vehicle is powered by a 605 cc Honda motorcycle engine, weighs about 600 pounds and has about 100 horsepower," Sears said. "It's pretty close to a Dodge Viper terms of horsepower to weight ratio. Everything on the car is custom manufactured, except for the engine and transmission. We needed to custom design our own fuel injectors and the whole intake manifold. It was no simple task even to get the thing to run. A lot of teams work right up until the buzzer on their cars."

The vehicle took two years to complete and cost almost \$30,000. The students acquired funds from the student activities fee and received corporate sponsorship from Altair Engineering. OU provided work space in a garage next to the Police and Support Services Building, where the students worked side-by-side with an Australian team from the University of Wollongong, which finished in 28th place.

"The Australian team approached Professor Sangeorzan and asked if they could stay here and work on their car, since we're the closest university to the Silverdome," Sears said. "They shipped their car in a crate, stayed in our dorms and worked on it next to us in the garage. It was more of a camaraderie thing than competition between us. We exchanged a lot of ideas."

Three OU mechanical engineering students took turns driving the aluminum-wrapped vehicle through the driving and performance events. In the acceleration competition vehicle speeds were recorded over 100 yards. The skid-pad competition required drivers to navigate a figure eight course at high speeds without hitting race cones. Vehicles successfully completing the skid-pad were allowed to compete in the autocross event, in which vehicles were timed as they navigated a one-mile course through tight left and right turns. OU completed the first three events and queued up for the endurance competition, a timed series of 20 laps during which fuel economy is tracked. But this final portion of the driving and performance competition was cut short by rain.

"The guys were really disheartened by the rain," Sangeorzan said. "We were in the top half of vehicles in acceleration and autocross events. I believe that we would have done reasonably well, especially for a first-year team, if we could have gotten through the endurance event. We had a very reliable car that gave us no trouble during the other dynamic events."

The students can take a lot of the knowledge they acquired during this year's event and apply it to the next year's competition, but they'll have to do so with a new vehicle. The rules of the competition stipulate that teams must bring a new car each year, Sangeorzan said.

"You have to rebuild the car from scratch," he said. "Essentially, you have to redesign the frame, suspension, body and drive train. That involves a considerable amount of work. We're going to take two weeks off because there were a lot of overnights in preparing for this event, then start over. We already have a preliminary suspension design and during the summer we'll redesign the frame.

"Our students really have a great deal of commitment to this project. A lot of other teams have large residential campuses and consequently have very large teams. Some have up to 50 students working on their cars. We had eight hard-core guys and 12 others also involved. And many of our team members are holding down part-time jobs and commuting to campus.

"Getting through the events we were able to was a highly worthwhile process because the students have to learn how the events are run and scored. It will only help them as they prepare for next year."

For more information on the competition, visit the [SAE Collegiate Design Series](#) Web site.

#### **SUMMARY**

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