



The racecourse in Ocala, Fla., had a number of deep streams that presented flotation challenges for Binghamton's team.

THE CHALLENGE

The Mini-Baja Project is one way — and for some, the most invigorating way — of fulfilling an eight-credit capstone design course, which requires all engineering seniors to work in teams, over two semesters, on a challenge presented by local industry.

The emphasis on teamwork is key, says the project's faculty adviser, Bruce Murray, associate professor and director of Materials Engineering, because it prepares students to be effective right out of school. In workplaces today, he explains, "typically you'll work with other engineers in designing projects and testing."

The Mini-Baja Project also builds technical acumen and resourcefulness. Through written reports, oral presentations and marketing initiatives, students pitch their skills and insights — communication abilities expected of today's engineer, according to alumnus Chris Richardson '02, who now works in engineering and sales for a Dallas-Ft. Worth company that designs freezers and coolers. "It used to be [an engineer was] a guy with a pocket protector sitting in the corner," Richardson says. "Now you have to be well-rounded."

Richardson, who was one of the Baja project's co-founders seven years ago, says he and fellow students looked for a senior project that was more complex than drafting garage doors. "We wanted something cool that had design we could sink our teeth into," he says. The Baja project caught their eye because of its hands-on aspect and feasibility.

Murray notes that although students have at least one lab class each year, the Baja project offers challenges they savor. "The engineering curriculum is

fairly theoretical," Murray says, "so [they] really look forward to designing a complicated system like this one."

FUNDRAISING TO DEFRAY COSTS

Faced with a bare-bones University operating budget of \$600, Baja teams in the startup phase look for ways to defray their full costs. This year, the Kiwanis Club helped the team with its \$6,400 in expenses.

Past teams have sold T-shirts and candy to raise money. Such national and local sponsors as Polaris Industries, Haun Welding Supplies, Binghamton Honda and Empire Plastics have donated parts and services in return for a chance to advertise their business names on the racing vehicle.

Teams divvy up design tasks, as well. This year, one engineer worked on suspension; two handled the engine, transmission and wheels; one focused on brakes; and another handled steering. A sixth person designed the frame within the first month. Blueprints were made with computer software.

Sander, who cited time management as a valuable lesson, says the computer lab is organization central for the team. "We always had checklists going," he says. "We started crossing things off as we got them done, to make sure we weren't forgetting anything and to keep the project from becoming too overwhelming."

But plans don't always meet with perfection in the Physical Facilities'

garage where parts are assembled. This year's Binghamton Racing team quickly learned that tools have limited uses, Sander says, and that tubing doesn't always fit at the anticipated angles. During their first race, in Ocala, Fla., their race car powered up hills but had technical difficulties in the half mile of water features.

Team members see the hurdles as part of the learning curve. "Sometimes you have no idea actually how to fabricate what you want on the product," says Levo, who worked on the braking system. "It makes us better engineers in the end."

MISSION POSSIBLE

Once out of the shop, the team tests its car to prepare for competition. "The gauntlet is a two-mile course where drivers do as many laps as they can in four hours," Levo says. "Many teams don't finish."

It may sound daunting but, having improved upon a model that earned Binghamton the Mini-Baja Midwest Rookie award in 2006, this year's team was confident its mission to do better in the June Mini-Baja World Championship in Rochester, N.Y., was possible. Although the cash prizes and job offers are motivational carrots, they aren't the ultimate measure of success, according to Richardson. He says the challenge of entering Binghamton's first car into a Mini-Baja competition in 2002 sparked a lifelong appreciation for the ingenuity and resourcefulness that are essential to his career.

"It either worked or it didn't," Richardson says. "If it failed, you didn't pass and didn't graduate. Failure is not an option." ❁