



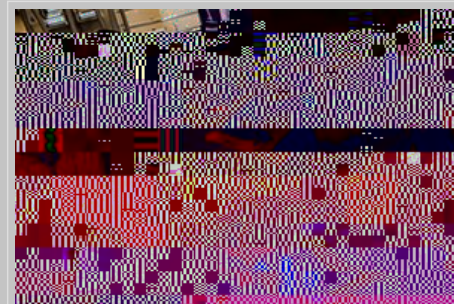
For the most part, the faculty in the School of Engineering are quite young, Onyancha notes. He believes Rose-Hulman can play a role in helping the program reach its potential.

"I would really like to see the Institute think about how to provide that leadership to new and upcoming engineering education programs around the world," he says.

### Student's Summer Composites Research to Drive HPV Improvements

When Rose-Hulman's Human Powered Vehicle team hits the pavement this season, they'll be trying out a new and improved carbon fiber body, thanks to the summer research project of the group's president, Andrew Miner. The junior mechanical engineering major from New Jersey worked with faculty mentor. Assistant Professor of Mechanical Engineering Simon Jones.

Miner was one of 11 students participating in this summer's Interdisciplinary Research Collaborative (IRC) and Rose Summer Undergraduate Research Program (RSURP). The programs are designed to provide opportunities for undergraduate students to engage in a full-time mentored summer research experience.



Andrew Miner researched standard industry specifications to create test samples for his summer research project in carbon fiber and polymer composite materials. (In other words, he researched to prepare for his research project.)

Projects this year spanned disciplines ranging from biomedical and mechanical engineering to mathematics, computer science and software engineering, biochemistry, and chemistry. Students submit a proposal, accompanied by a letter of support from a faculty mentor, in order to be considered for a summer research slot.

For Miner, the program provided an opportunity to learn more about composites while helping to improve his team's performance in the American Society of Mechanical Engineers' (ASME) Human Powered Vehicle Challenge. The teams are judged on design as well as performance in the competitions.

"One of the problems we face with HPV is we overbuild because we don't know how good our [carbon fiber reinforced polymer] lay-ups are," Miner explains. Because of this, the vehicle ends up heavier, which slows it down and adversely affects team members' endurance. Overbuilding also costs the team design points.

Through his summer research experience, Miner was able to test the strength of the composite materials that the team uses to determine the optimal thickness that would meet safety standards while contributing the least amount of weight to the vehicle.

Professor of Chemistry Mark Brandt (IRC) and Professor of Mathematics Allen Broughton (RSURP) served as directors for this year's jointly run programs. Brandt says the programs help give students a taste of what they can expect in graduate school or research in industry, and helps them apply their classroom lessons to real-life projects.

"Classwork is different. Everybody knows that there's an answer. And research—maybe there is, maybe there isn't," Brandt says. "Having that kind of experience with an open-ended type of project becomes extremely important."

### Get to Know Distinguished Teaching Fellow Anjan Ray

This fall, the department welcomed Dr. Anjan Ray as its first Distinguished Teaching Fellow. Dr. Ray comes from IIT Delhi where he had connected first with Dr. Jim Mayhew prior to his sabbatical in India last year. Dr. Ray attended Michigan State University at East Lansing for his graduate studies, where he lived for a little less than six years. And although that experience gave him a level of familiarity with teaching methods in the U.S., he says that he hopes to learn still more during his time here.



Anjan Ray

"I am of course in a teacher's role and I want to explore how things are done differently in a U.S. institution, and specifically at Rose-Hulman, which has a strong commitment to undergraduate education. At an individual level, I want to also find out whether I can be effective in a different setting, with a different student body," he adds.

Dr. Ray taught Conservation & Accounting Principles during the fall quarter, and will be teaching that course as well as Special Topics in Mechanical Engineering during the winter quarter.

"I also hope that since I come from a different background, students can learn something from me. I don't have a clear idea as to what that something is, but I think differences in background can be beneficial, if there is a positive intent to



Now he's taking the lessons he learned both to a new business and back to the classroom.

"My integrated project was doing a marketing analysis and preparing a business plan for an aquaponics operation in Terre Haute." In the process he met Matt Pollom, who was pursuing the same type of enterprise. Pollom had previously helped establish an aquaponics greenhouse at Ivy Tech in Terre Haute. The two decided to join forces to make the aquaponics venture a reality.

While still on sabbatical, Chambers tapped Rose-Hulman's student resources through a capstone design group that created a small scale aquaponics set-up. In it, crayfish provide nutrients for leafy green plants suspended above their tank.

The trial currently resides in the Branam Innovation Center, but the full-scale operation will be built in a building Chambers owns in Brazil, Indiana. That's where the second student group comes in. With Pollom as its client, the second capstone group is designing the layout in the building to "optimize the grow space and maximize the harvesting ability." The plan is to start with leafy greens, then gradually add more vegetables, while raising tilapia, perch, and prawns.

But he didn't only gain business knowledge through the experience.

"I got to go back to school and be reminded of what it's like to be a student. Also, I was able to bring a lot of this back to the classroom," he adds. He is looking forward to delivering his new Business Statistics course this winter quarter and is a member of the steering committee which is coordinating a Start-Up Weekend for local entrepreneurs.

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