

## Rose-Hulman Institute of Technology

### Building the foundation for an innovative curriculum

The Rose-Hulman Institute of Technology, a four-year engineering school located in Terre Haute, Indiana, recently purchased 70 NeXT Computers to design and teach a new integrated, first-year curriculum in science, engineering, and mathematics.

At many schools, engineering curricula are often "compartmentalized." There are physics tools for solving physics problems, chemistry tools for chemistry problems, and mathematics tools for mathematics problems. Educators at Rose-Hulman believe that this compartmentalization cripples learning, because ideas, concepts, and problem solving techniques in one discipline do not support learning in other subjects. The goal of the new curriculum is to give students broader problem solving skills—the kinds of skills that can be used in all their classes.

For example, students will be taught fundamental mathematical concepts—such as differentiation—not by focusing on manipulating equations, but instead on understanding how concepts apply to actual problems in physics, chemistry, and engineering.

Jim Eifert, Vice President for Academic Affairs, believes this technology is going to have a profound effect on the profession of engineering. "Because the computer can do the mathematical calculations, it will make the field of engineering more accessible to those who may not be naturals at grinding out mathematical equations. This will open up the profession to more creative minds with new perspectives on solving problems."

By standardizing their curriculum on one computer, Rose-Hulman will help students make connections between disciplines, which, in turn, will make them better problem solvers. Jeffrey Froyd, Associate Professor of Electrical Engineering, believes that the NeXT Computer offers exactly what students need. Because all NeXT applications—word processing, graphics, NeXT Mail, and Mathematica—work together, students are able to move data between programs easily which encourages them to explore different problem solving techniques. And the NextStep development environment will enable professors to create customized courseware that fosters this kind of learning.

"As an educator, I need to look down the road 20 years to when these students will be at the peak of their careers. Engineers in the future will do a lot less manipulation of equations and a lot more creative thinking. So we need to prepare these students now to be able to excel in that environment and teach them with the tools they will be using in that future world," says Eifert.