Classroom Creativity

One of the ways that NJIT works to attract the best and the brightest students to the technological professions is by keeping the educational programs at the cutting edge both in content and in approach. Students learn hands-on using the tools and techniques they will find in the workplace.

One creative approach to education is the biomedical studio program designed by Richard Foulds, professor of biomedical engineering (shown above with student Liz Mayo testing a CyberGlove).

Biomedical engineering majors in Foulds’ freshman design studio tackle the fundamentals of engineering by active, hands-on, experiment-based learning. Instead of listening to lengthy lectures, students in the studio-based program work in teams to perform angioplasty on pasta, amniocentesis on jelly donuts and surgery on hot dogs.

Developed with funding from the NSF and the Whittaker Foundation, the studio classes are taught in specially designed classrooms equipped with sophisticated equipment. The studios are wired for the Internet and multimedia equipment and are furnished with ten PC-based lab stations that serve groups of students. The studios also have customized biomedical equipment such as amplifiers, oscilloscopes, power supplies, function generators and multi-meters.

Robotics is another emphasis of the program, which was featured in the Chronicle of Higher Education. The students must first design robots that will perform certain tasks, such as reattaching the tip of a hot dog, which simulates surgery on an amputated finger. They then build the robots using LEGO® Mindstorm kits, which have about 1,000 gears, levers, motors and sensors. Foulds says that it’s a fun exercise with a serious purpose — surgical robots will play a critical role in the future of medicine, allowing surgeons to not only be more precise, but to routinely perform operations from remote locations.

Foulds was voted 2005 Teacher of the Year by the NJIT Student Senate for his innovative teaching methods.
Another example of curriculum innovation is the new first-year program at New Jersey School of Architecture, designed by Professor Glenn Goldman and launched in September 2004. The revamped first-year architecture program, featuring a 3-D electronic, paperless, digital architectural design studio, works to prepare students for the 21st century architectural practice. The new program moves freshman students directly into design using electronic media, eliminating the parallel traditional training completely. Goldman says that the digital media allows for more creativity and empowers the designer, thus engaging the first-year student more fully. The program, which also emphasizes frequent presentations to colleagues and critics, was selected by Campus Technology magazine as one of 13 Innovators 2005. Campus Technology applauded the 2005 innovators as “visionary” schools, “taking technology to new heights.”

In Other Projects

**THE CAPSTONE PROGRAM** allows seniors majoring in computer science to integrate real-world experience into their academic program. Directed by Osama Eljabiri, special lecturer, the program matches teams of four to six students with clients from industry, small businesses, educational institutions and government agencies who need computer programming support such as databases, specialized software or e-commerce applications. Since the program began in 2002, some 1,000 students have participated in 200 projects. Clients have included CIT Group, Scholastic Books, Avis Car Rental, CyberExtruder, Cook College, NASA and the New Jersey Office of the Governor. In addition to providing the client with the product requested, students present their projects to the university community at a computing fair.