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Virginia Polytechnic Institute and State University



Professor Peter Rony, Department of Chemical Engineering, Virginia Tech.

Adobe Acrobat Reduces Higher Education Costs and Helps Chemical Engineering Students Learn Leading-Edge Computer Skills

With a population of almost 24,000 students and 5,500 faculty and staff members, Virginia Polytechnic Institute and State University (Virginia Tech) found that consistent, timely distribution of key course information was an arduous and expensive task. This is no longer the case for the Department of Chemical Engineering, where one professor conducted a pilot program that almost completely replaced hard-copy document distribution with on-line access. Adobe Acrobat software figured prominently in the success of this project.

“As soon as I saw what Acrobat could do, I knew it would benefit my students as well as the university immensely,” says Peter Rony, professor in the Department of Chemical Engineering. “Distribution of course mate-

rials, software manuals and other university documents involves a great deal of time and money for paper, printing and duplication. The department cannot assume all of these costs, so many are passed on directly to our students.”

Reduced Costs

As is the case with most universities, students incur significant costs purchasing software and hard-copy textbooks, manuals and lecture notes. The faculty also gets caught up in the paper chase, keeping track of the many reports, technical articles and other documents written by students or colleagues.

To save costs, Rony publishes software manuals and other key course materials electronically as Portable Document



Format (PDF) files using Adobe Acrobat software. These files are made available on servers in the chemical engineering controls laboratory where students can view, copy or print whatever files they need. "I save about 5 cents per page distributing materials electronically," says Rony. "With typical documents varying from 50 to 200 pages each, that's a substantial savings that I can pass on to my students."

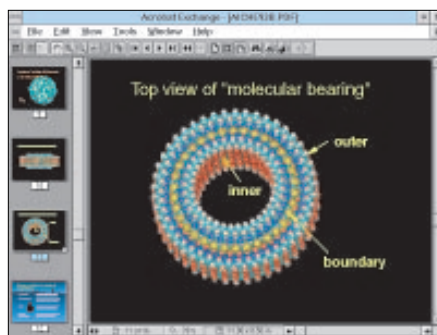
More Effective Communication

Virginia Tech has more than 8,000 PCs running DOS and Windows™, as well as Apple® Macintosh® computers, Sun™ workstations and an IBM® mainframe system. "We are a very computer literate university, but we need to be able to exchange information more effectively between many different kinds of computers," says Rony. "Acrobat allows us to provide that exchange electronically, independent of the computing platform or software and font configuration. I can create a single, high-quality text and graphic document that can be accessed by anyone."

According to Rony, Acrobat software makes it easier for him to communicate with students and colleagues, and vice versa. "I can provide richer information to students, because the PDF files I create contain elements such as color images and color screen captures—much richer information than can be found on the black-and-white printed page."

During the 1993–94 pilot project, Rony encouraged students to submit technical papers in electronic form. He converted the documents into PDF files and transmitted several of them to colleagues who wanted examples and information on technical report writing.

In addition, very few students have modems to dial into the university network, so being able to take files home on a diskette can be very helpful. Documents that are



PDF file of a freshman engineering orientation presentation; Dept. of Chemical Engineering, Virginia Tech.

hundreds of pages long and include multiple images and graphics can fit on a single 1.44 MB floppy diskette. "Adobe Acrobat is very helpful for information distribution," says Rony. "It compresses most files by an impressive factor of five."

Rony is using Adobe Acrobat to communicate with students and colleagues in other innovative ways. November 1994 marks the 25th anniversary of the CACHE (Computer Aids in Chemical Engineering) Corporation, a not-for-profit corporation serving chemical engineering departments nationwide. To honor the event, Rony is publishing a CACHE CD-ROM containing information about the application of computers in chemical engineering education, including lectures and software manuals in PDF. The CD-ROM will contain copies of Acrobat Reader for DOS, Windows and Macintosh so that Rony's department colleagues can have access to the information.

Rony also contributes manuals and other documentation in PDF to the Virginia Tech Engineering CD-ROM which goes to the more than 1,000 freshman in the College of Engineering.

Creating a Standard

The pilot program has convinced Rony to adopt Acrobat software as the department standard for electronic distribution. Starting in the 1994–95 school year, he plans to distribute key course materials—including

software manuals, assignments and laboratory experiment procedures—only as PDF files. Students will be required to submit all technical reports as PDF files as well. "Once I started producing Acrobat PDF files for my students," says Rony, "I developed more creative ideas for how to get electronic information to my students at a very low cost. Using Adobe Acrobat to communicate information provides the additional benefit of helping me introduce my students to the new world of electronic communications. I find that they are now starting to use their computers more often and in more interesting ways."

"Acrobat is part of the growing, exciting movement of electronic communications. I would even like to see textbooks published electronically so students could adapt them to their individual learning needs," Rony says. "For example, a student could create a duplicate PDF textbook and annotate it, or pull out key material and insert pages from other PDF files that the professor provides. This would make the information more useful and give professors a wider range of instructional materials to choose from."

"As the dissemination and retrieval of electronic information catches on," Rony says. "Acrobat will play an important part in my ability as a professor to share volumes of important information without being burdened by the cost of paper."

Virginia Polytechnic Systems at-a-Glance

Hardware
Macintosh computers
PCs running DOS and Windows

Software
Acrobat Exchange
Acrobat Distiller™
Acrobat Reader
Aldus® Persuasion®
Microsoft® Word
WordPerfect®
Internally developed chemical engineering software