

UT College of Natural Sciences Information Technology Vision Plan

2005-2006

Introduction

The College of Natural Sciences is arguably the largest provider of information technology to UT students.

- We put more than 1,000 computers in front of students of all majors.
- We have 5,285 seats in 54 technology classrooms and auditoriums; 15 of these auditoriums are also equipped with student response systems.
- We have 30 instructional computer labs for undergraduate and graduate students, including two joint-use labs open to all students at the university.
- We have 75 undergraduate science labs, most of which are equipped with computers used in conjunction with experiments.
- We are the college whose buildings have the most square footage, so our wired and wireless network is the most extensive on campus.
- Most of our departments operate their own mail servers, file servers, web servers, backup systems, and printing facilities, which serve students in those departments.

While bigger certainly does not mean better, we strive for all our information technology to be state-of-the-art and to lead the university in innovation.

The College of Natural Sciences spends more than \$3.5 million annually on instructional information technology and its maintenance. Almost two-thirds of this is from a college-level IT fee that pays our support staff. We rely on our ITAC allocation to purchase all our equipment.

More than half of our ITAC allocation is required simply to keep our heads above water. The math is simple: if we replace one-fourth of our 1,000 computers each year, that alone requires more than \$375,000. Aging network electronics and A/V equipment also must be replaced.

The remainder of our ITAC allocation is for expansion and innovation: new technology classrooms, more technology in science labs, expanded wireless coverage, the next generation student response system, automated recording of lectures for student review, etc.

This report has intentionally been kept brief. We invite everyone to tour our facilities, see our progress, and hear about our plans for the future.

Our Vision

Our management and expenditure of student fee money and our requests for future funding are guided by the four principles described below. While these principles may seem obvious, it is not clear they are followed everywhere on campus.

1. Protecting Each Investment of Student Fee Money

Caring for equipment and facilities can easily be as expensive as their initial cost. Too often there is a tendency to build new facilities without concrete plans or funding for their maintenance. The College of Natural Sciences does not make that mistake with student fee funded facilities.

Every computer in our \$1,500,000 inventory has been purchased with a four year warranty from Dell or Apple that ensures the computer will remain in good working order for its lifetime, regardless of future funding levels. The \$2,000,000 of A/V technology in our classrooms is inspected and cleaned every day by a staff of 25 student assistants to ensure that every classroom is as perfect as the day it was built. The College of Natural Sciences has even taken over responsibilities neglected by the university. We are replacing rotting carpets and broken furniture in classrooms, and when necessary we even outsource the cleaning of our classrooms.

Each year an increasing percentage of our budget goes toward maintenance and life cycle funding: keeping equipment in good working order as long as is practical and then replacing it with new equipment. We believe this is the only responsible strategy.

2. Innovating for the Future

Six years ago the College of Natural Sciences led the university by creating the first standardized technology classroom. We continue to use student fee money to innovate.

This spring the College of Natural Sciences will deploy the first permanently-installed, fully-automated, faculty-operated system for recording classroom lectures and serving them up to students for review and study. This system - to be installed in WEL 2.224, our largest auditorium - will be duplicated in other technology classrooms in the coming year.

This fall we created our first “technology science lab” in PAI 1.32. This project brings the same technologies found in our technology classrooms to undergraduate science labs in areas such as Biology. Using camera-equipped microscopes, what one student sees under a microscope can be immediately shared with the entire class by projecting it on the screen.

The College of Natural Sciences was the first to use student response systems (CPS from eInstruction) to improve student/faculty interaction in large classes. These systems allow faculty to ask questions in class and immediately see student answers. Faculty are able to

adjust their lectures to address student needs, and students are more likely to attend lectures. This year we will be converting to a new student response system that uses radio frequency technology and hope to support student response systems in every general purpose classroom in our college.

The College of Natural Sciences is home to the Interactive Homework Service, a web-based system that provides homework problems and practice problems to students in Physics, Mathematics, and Chemistry. The system grades the solutions to problems and provides instructive feedback.

And, the College of Natural Sciences is in the midst of the most extensive deployment of 802.11g wireless networking on campus.

3. Serving the Entire University

The College of Natural Sciences - like the College of Liberal Arts - offers a huge number of service courses. It is unlikely that an undergraduate will receive a degree from our university without taking some of our courses. Students and faculty from across campus use our 56 general purpose classrooms. And, students from across campus work in our joint-use computer labs.

For these reasons, most of the ITAC funds that we spend benefit the entire university. We have always given top priority to shared facilities. Our first technology auditorium built in 1998 was a general purpose classroom, and within a year every one of our general purpose classrooms will be a standardized technology classroom. Our technology classroom team responds to the needs of all faculty teaching in our classrooms, regardless of the college or school they come from. We employ students of all majors to work in our computer labs and technology classrooms. And, our auditoriums are in high demand for university-wide events.

4. Achieving Synergy with Multiple Fees

Highly specialized student fees are a double-edged sword: they provide for some needs while neglecting others. A student may find state-of-the-art computers in a room that floods every time it rains. Or, a student may attend a lecture that employs modern A/V technology in a room that smells of rotting carpet and uncleaned food and drink spills.

In the College of Natural Sciences, we are combining multiple student fees to solve problems and give students facilities that we can all be proud of. It is becoming less common to spend ITAC funds by themselves or to think of a project as simply “an ITAC project”.

A good example is BFL 117, a newly renovated science lab for teaching field biology. ITAC funds were used to provided a computer for each student in the lab and a projection system for the instructor. Other student fees paid for scientific equipment, furniture, and room renovations. Without multiple fees, we could have done only part of the renovation and the results would have been far less impressive.

Specific ITAC Funding Requests for 2004 - 2005

Note that about half of our request is for life cycle funding: upgrading and replacing aging information technology in our classrooms and labs, and keeping our network state-of-the-art. The other half of our request is for the creation of new facilities and innovative projects.

New Technology Classrooms: \$325,000

We plan to modernize the remaining 13 general purpose classrooms in our college, so that faculty are guaranteed standardized technology no matter where they teach in our college. The College of Natural Sciences will use local funds to pay the staff who assemble, install, and maintain this equipment.

Existing Technology Classrooms, Upgrades and Operation: \$200,000

Although college funds are used to pay the staff who maintain and upgrade our technology classrooms, funding is needed to repair and replace aging equipment. We plan to replace five year old projectors and document cameras. At a cost of \$500 each, replacing the bulb in each of our projectors once a year costs \$35,000. We use thousands of batteries each year in our wireless microphones. And, we maintain 75 overhead projectors, which some faculty continue to use.

Technology Science Labs: \$125,000

We plan to build 12 technology science labs, which contain much of the same equipment as our technology classrooms but without a large podium. This first group of labs will be in the School of Biological Sciences and the Department of Human Ecology.

Replacement of Aging Computers: \$300,000

One quarter of our approximately 1,000 computers in computer labs, science labs, and technology classrooms need replacement each year. We budget \$1,450 for each PC and \$1,600 for each Apple.

Wireless and Wired Networking: \$150,000

We are in the process of providing standardized 802.11g wireless networking throughout our college. Students will be able to access the Internet from their laptops whether they are in libraries, classrooms, science labs, hallways, or offices. RLM and Welch have been equipped. Five more buildings with high concentration of students will be done this year. A portion of this request will also fund new switches and cable pulls to keep up with the growing demands being placed on our network.

Lecture Recording Systems: \$75,000

The first permanent, faculty-operated system to record classroom lectures will be operational in WEL 2.224 (our largest auditorium) in January 2004. We plan to expand this capability to three other classrooms in the coming year. This system will be available to faculty from all colleges who teach in Natural Sciences classrooms.

Classroom Student Response System: \$25,000

The student response system (called CPS, from eInstruction) which is now available in 15 of our auditoriums uses infrared technology that is being made obsolete by a new, radio frequency technology. We need to convert our existing systems to this new technology by buying and installing new receivers in all our classrooms.

Servers, Storage, and Backup: \$100,000

In addition to the computers in our general purpose labs, we contribute to the cost of departmental servers that host student web pages and files, store class related information, and move email between students and faculty. This funding also provides for the servers for our instructional computer labs.

TOTAL REQUEST: \$1,300,000

Summary of 2003 - 2004 Expenditures

It is beyond the scope of this report to detail every student fee funded IT expenditure in the College of Natural Sciences. We have chosen to group and report expenditures according to type.

New Technology Classrooms: \$350,000

During Summer 2004, we completed fourteen new technology classrooms, each seating 40 to 50 students. Twelve of these fourteen rooms are general purpose university classrooms; two are departmentally scheduled. We currently spend about \$25,000 to modernize each room.

Technology Classroom Upgrades: \$150,000

We now have technology classrooms that are six years old. Old A/V equipment becomes failure prone and does not meet the expectations of our faculty and students. During Summer 2004, we replaced ten LCD projectors in large auditoriums with new high-lumen projectors. And, we replaced ten aging document cameras with a new generation of document camera that has a higher refresh rate. The old equipment is redeployed in less demanding applications or serves as backups to our new equipment.

Replacement Computers: \$325,000

During 2003-2004, more than 200 four year old computers were replaced in instructional computer labs, science labs, and technology classrooms. Just replacing the aging Apple computers in our technology classroom consoles with new G5's cost \$115,000.

Wireless Networking: \$200,000

During Summer 2004, we equipped two buildings with 802.11g (54 Mbps) wireless networking: RLM and WEL. These buildings were chosen because they are the largest buildings in our college and contain the most classrooms, teaching labs, student offices, and student study areas. Each building also contains a library, now covered by wireless networking.

Everything Else: \$275,000

Some of our most important project are not our most expensive. During 2003-2004, we renovated a new room for the Physics graduate computer lab. We built our first "technology science lab" in PAI 1.32 for introductory Biology. We expanded our use of the CPS student response system. We contributed to the cost of departmental web, file, and mail servers, as well as backup systems. We purchased licenses for a wide variety of applications specific to the teaching and learning of science. We bought supplies for our technology classrooms. And, we contributed \$25,000 to the ITS Network Operations Center for the benefit of the entire university.

TOTAL EXPENDITURES: \$1,300,000