

College of Natural Sciences Information Technology Vision Plan

2001-2002

Introduction

The College of Natural Sciences is dedicated to using information technology to enrich the educational experience both of our majors and of the thousands of students throughout the university who take our courses.

We believe information technology should impact our students in the lecture halls, in our science labs, and in their dorm rooms. To this end, we must provide state-of-the-art networks, instructional computer labs, powerful server machines, and technology rich classrooms and laboratories. We must have a professional staff to support and maintain these facilities, and we must be constantly upgrading our hardware and software to keep it current. And, most importantly, we must give our faculty the support they need to revise and enhance their courses to take advantage of information technology.

Current Funding

The College of Natural Sciences has historically received between \$1.1 and \$1.2 million from the University-wide Information Technology fee, plus \$2.0 million from the Natural Sciences Information Technology fee.

The Natural Sciences IT fee pays for people: a computer facilities coordinator in each department, hardware and software support staff, network support staff, lab managers, and dozens of proctors for our many instructional computer labs. This fee also provides a very small amount of M&O so departments can purchase computer related supplies.

This college-wide IT fee is now totally allocated to recurring expenses, and we have requested an increase in this fee so we can give our existing staff salary increases and hire additional staff for new projects.

We rely on the University-wide Information Technology fee to fund all of our instructional computer hardware, networking, and technology for classrooms and auditoriums. More than a third of this money is now allocated to lifecycle funding of the hundreds of computers, servers, and printers in our instructional facilities, which we replace on a three year cycle.

We have no surplus funds; each year we spend our entire allocation. Our accounts sometimes have significant balances that are needed to pay outstanding debts. For example, we ordered \$200,000 of network electronics last summer, but the money wasn't deducted from our

account until September. Similarly, Physical Plant renovations and Telecommunications recabling projects are often not paid until months after the work is ordered.

Our Vision and Current Status

Instructional Computer Labs

The College of Natural Sciences now has more than 600 ITAC funded computers (costing over \$1 million) located in more than 30 labs. These labs include general purpose instructional computer labs, course specific computer labs, science teaching labs, computer classrooms, and technology classrooms and auditoriums. The following is a partial list, including the number of computers in each room:

RLM 13.116	Astronomy	undergrad non-major lab	20
RLM 13.128	Astronomy	undergrad majors lab	3
RLM 13.130	Astronomy	undergrad majors lab	4
ESB 101	Bio Sciences	Joint use lab - Mac	29
ESB 103	Bio Sciences	Joint use lab - PC	30
BIO 404	Bio Sciences	Grad student lab	8
PAT 306	Bio Sciences	Grad student lab	6
ESB 206	Bio Sciences	Grad student lab	8
ESB 406	Bio Sciences	Multimedia lab	12
ESB various	Bio Sciences	Various Biology teaching labs	12
WEL 2.306	Chemistry	Joint use lab - Mac room	25
WEL 2.302	Chemistry	Joint use lab - PC room	38
WEL 3.428	Chemistry	Multimedia lab	8
WEL 2.108	Chemistry	Course specific lab	7
WEL 2.200	Chemistry	CH 204 computer lab	25
PAI 3.22	Computer Science	Lower division undergrad - PC	35
PAI 3.12	Computer Science	Lower division undergrad - Mac	20
PAI 1.44	Computer Science	Upper division - PC	10
TAY basement	Computer Science	Graphics lab	23
GEO 111	Geology	Computer classroom	17
GEO 210	Geology	Undergrad lab	8
GEO 507B	Geology	Grad student lab	14
GEA 27/29	Human Ecology	Undergrad/grad lab	38
Port Aransas	Marine Sciences	Undergrad/grad lab	6
RLM 8.136	Mathematics	Undergrad/grad lab	31
RLM 8.118	Mathematics	Undergrad/grad lab	10
RLM 9.120	Mathematics	Undergrad/grad lab	6
RLM 10.130	Mathematics	Undergrad/grad lab	6
RLM 7.308	Physics	Physics Microcomputer Lab	50
RLM 3.118	Physics	Grad student lab	12

RLM 8.202	Physics	Undergrad Physics teaching lab	12
various	Natural Sciences	Technology classrooms/auditoriums	24

We replace these computer every three years to ensure that our students have access to state-of-the-art hardware and software. (Extended warranties also last three years.) The old computers that are still working are handed down to lecturers or are used in other education-related projects. The demand for computers in science labs is increasing. Computers now interface with scientific equipment (including microscopes) so that students can gather and analyze data and images in real time. As we modernize the science labs in our college, we expect to place a computer at every lab table.

Technology Auditoriums and Classrooms

The College of Natural Sciences sets the standard at UT for the modernization of auditoriums and classrooms with projection/sound systems and networked computers. We are in the midst of a five year plan to modernize all of our larger rooms. The following is our current inventory, including the seating capacity and the department having scheduling priority in the room:

GEO 100	291	Geo Sciences
PAI 3.02	216	Bio Sciences
WEL 2.224	488	Chemistry/Biochemistry
TAY 2.106	160	Computer Sciences
WEL 3.502	216	Astronomy
GEA 105	173	Human Ecology
RLM 5.104	84	Astronomy
RLM 6.104	84	Mathematics
RLM 7.104	84	Physics
WCH 1.108	30	Dean's Scholars / Natural Sciences
WEL 2.122	120	Chemistry / Biochemistry (Jan. 2001)
WCH 1.120	329	Natural Sciences and Liberal Arts (Jan. 2001)
RLM 4.102	160	Math / Physics / Astronomy (Summer 2001)
WEL 1.316	255	Shared by all departments (Summer 2001)
ESB 115	144	Biological Sciences (Summer 2001)

These auditoriums are revolutionizing undergraduate teaching at UT. Faculty fight to be assigned one of these rooms so they can incorporate technology in their classes. Student groups make heavy use of these rooms in the evenings. Because almost all of these rooms are general purpose classrooms, virtually every UT student will benefit from this expenditure of ITAC funds. In 2001-2002 we plan to modernize seven more rooms including several rooms used by smaller classes. Modernizing a large auditorium costs \$80-100K. Modernizing a classroom costs \$30-35K. This is perhaps the best investment of ITAC funds that has ever been made.

Curriculum Development

Each spring we solicit proposals from faculty for special projects relating to the use of information technology in classes. The projects vary from year to year, but all help faculty to use the information technology we place in classrooms and laboratories.

We are proud to have invested \$120,000 of ITAC funds this year in the Interactive Homework Service being developed jointly by Physics, Mathematics, and Chemistry/Biochemistry. This project is making thousands of homework and practice problems (together with their solutions and explanations) available to students on the web in these three disciplines. Universities and high schools around the world are patterning similar systems after ours. We expect to continue funding this important project.

Networking and Associated Electronics

The College of Natural Sciences occupies more than a dozen buildings. The networks in these building provide our computer labs and technology auditoriums with access to the outside world and make possible communication between students, TAs, and faculty. Our current vision is to provide switched 10/100 Mbps service over CAT 5e wiring throughout our College. We are constantly adding ports, replacing old wiring, and updating electronics. Since the technology is constantly improving, we see no end in site. The following is a summary of the network electronics currently in our buildings:

WEL	all switched 10/100	modernized	in	1999
WCH	all switched 10/100	modernized	Spring	2000
PAT	all switched 10/100	modernized	Summer	2000
MBB	all switched 10/100	modernized	Summer	2000
ESB	at least switched 10	being	modernized	Fall 2000
MSI	mostly hubbed	to be	modernized	in early 2001
TAY	mostly switched	modernization	to be completed	Spring 2001
GEO	mostly hubbed	will be	modernized	Spring 2001
GEA	mostly hubbed	will be	modernized	Spring 2001
PAI	various technologies	scheduled	for modernization	in 2001-2002
BIO	mostly hubbed	scheduled	for modernization	in 2001-2002
RLM	various technologies	scheduled	for modernization	in 2002

The cost of totally upgrading the network electronics in a building runs from \$50-60K for a small building (GEA, GEO), to \$100-110K for a large building (PAT, WEL), to \$250K+ for a behemoth (RLM).

Departmental Servers

Each department maintains its own servers for web, file, and email access. Each instructional computer lab also has servers supporting its machines. Like all computers, these systems have a useful life of 3-4 years and must be replaced regularly. Unlike most computers, these systems

have to include a large-capacity RAID disk system and an automated tape backup system. A fully equipped departmental server can cost \$25,000.

Portable Projectors and Notebook Computers

To meet the needs of faculty teaching in rooms that have not yet been modernized, we provide light-weight, portable LCD projectors (\$5,000 each) and laptop computers (\$2,700 each). Our goal is to provide each department with between two and five of these systems that faculty can check out. The laptops are also used in the field by several courses.

Specific ITAC Funding Requests

Technology Auditoriums and Classrooms \$ 415,000

Our current plans are to modernize three large auditoriums (TAY 2.006, WEL 2.246, and PAI 2.48) and five small auditoriums / classrooms (GEO 112, RLM 15.216, WEL 2.304, WEL 2.308, and WEL 2.312). With one exception, these are all general purpose classrooms used primarily by Natural Sciences, but available to the entire university.

Instructional Computer Labs \$ 360,000

We will replace about 150 computers in our existing instructional computer labs and add 50 new machines to our science labs. We expect to pay \$1,500 to \$1,800 for each new system. This money will also fund printers and scanners for computer labs and high-end computers for multimedia labs.

Faculty Curriculum Development Projects \$ 250,000

As in the past, we plan to fund faculty projects to integrate information technology into their classes and to take advantage of the computing facilities in our college. These projects will include the development of web sites for classes, the design of multimedia presentations for classes, and the use of information from the World Wide Web in lectures. A significant amount of this money will support the Interactive Homework Service.

Networking and Associated Electronics \$ 150,000

With the guidance of ACITS, we will totally upgrade the network electronics in BIO and PAI, and begin upgrading the electronics in RLM.

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.

Portable Multimedia Equipment \$ 50,000

We expect to fund six light-weight LCD projectors and notebook computers for checkout and use by faculty teaching in rooms that have not yet been modernized.

TOTAL REQUEST

\$ 1,325,000