

JACKSON SCHOOL OF GEOSCIENCES

ITAC VISION PLAN, AY 2007-2008

SUMMARY OF REQUESTS

The Jackson School of Geosciences (JSG) is requesting a total of \$50,000 for IT special projects and \$142,500 for recurring and infrastructure expenses for AY 2007-2008.

Infrastructure and Recurring	\$142,500
End-User IT Support (1.0 FTE)	\$60,000
Annual Maintenance of Technology Classrooms	\$25,000
Deep Cleaning of classrooms	\$12,000
Student Computer Lab (life cycle, expansion)	\$30,000
Classroom Printers (life cycle, standardize)	\$5,000
Software Licenses (VGStudio Max, ArcInfo)	\$10,500
One-Time Allocations	\$50,000
Renovate 2.108 (first technology classroom)	\$20,000
Migration of Unix workstation lab to high-end PCs running Linux	\$20,000
RAID array for data storage in Linux lab	\$10,000

OVERVIEW OF CURRENT IT PROGRAMS AND INFRASTRUCTURE

Goals of the Jackson School

The Jackson School's Department of Geological Sciences, located in the Geology building, serves our own students as well as around 1,500 non-major undergraduates who take our diverse earth science courses as electives each year. Integral to our instructional

activities are the 19 technology classrooms and labs in the Geology building. Six are general purpose rooms while the rest are specific to our academic unit (see table at the end of this document). Keeping the equipment up to date and in good working order and providing adequate security for the rooms are top priorities for us.

Geoscience investigations are unique in their broad use of both visual and analytical methods. We use specialized software in many of our courses to teach students specific skills, to display complex three-dimensional images and demonstrate analytical and interpretation techniques, and to help prepare students for professional careers in which they can expect to use these same software products.

Undergraduate Program Growth

For the past 20 years, the department has had fewer than 10 freshmen each fall. In Fall 2006, we had 140 freshman applicants of which around 100 were admitted. This nearly doubled our undergraduate population. Reasons for this large increase include high energy prices (there is a strong correlation with UT geoscience enrollments); a strong career services center in the department; a new JSG presence on the UT admissions website; and JSG participation in several university-wide recruiting events.

IT Infrastructure and Other Programs Requiring Recurring Funds

Geoscience IT infrastructure and other programs that require recurring funds fall into two categories: support staff salaries and maintenance of equipment. The Department currently has approximately 2.0 FTE of classified staff positions to maintain the servers, network, instructional equipment, desktop computers, student computer labs, and course websites as well as provide end-user support. With around 450 fixed and mobile users (faculty, students, and staff), our ability to provide end-user support is stretched unacceptably thin. Our request for salary for an end-user support person (1.0 FTE) is a top priority for our ITAC proposal this year.

Continued maintenance of our technology classrooms is critical to our ability to serve our growing student population. Life-cycle replacement of equipment, standardization of equipment, and expansion of some rooms are important recurring IT expenses.

IT Infrastructure

We maintain ten servers that host web, data, and shared software and licenses. They are attached to a tape backup system. We have a Cisco 6500 router and eight 48-port switches in the old wing that can handle either T10 or T100 bandwidths. There are a similar number of switches in the new wing. All switches in the old and new wings connect to the router with fiber. We do not have a departmental firewall. Individual desktop computers have security software.

During Spring of 2007, we will install a new backup system purchased with our '06-07 ITAC allocation. With 10 servers and more than 500GB of data, we found it necessary to employ a two-tier system comprised of a set of dedicated hard drives and a tape array that can handle 2 terabytes of data. Data can be written to the hard drives faster than to tape, so we can complete the first step during off hours. Then the data can be moved from the dedicated hard drives to the tape array during business hours. In the event of a disaster, recovery and restoration of data can be made much more quickly from hard drives than from archive tapes.

Our program-specific technology classrooms and labs are now all protected by Locknetics SmartLocks. All faculty, staff, and students have been issued an iButton instead of keys to these rooms. Because of the different scheduling needs of the general purpose classrooms, we did not put SmartLocks on those rooms. The locks, door closers, software, and dedicated laptop for the security database were purchased with departmental and other funds.

The Geology building is nearly completely covered by the UTNet wireless network with denser coverage in the larger classrooms. Expansion of wireless coverage was accomplished in Fall 2006 with the help of the College of Natural Sciences.

We have a teaching classroom with 21 desktop PCs networked to a server and a printer. This classroom, one of the first technology classrooms to be built on campus, is in heavy use during the long semesters because students can obtain hands-on experience in creating and running a variety of computer models.

The Department maintains an undergraduate computer lab with 12 computers and two printers. We have a graduate computer lab with 20 computers, a large-format color plotter, and two printers.

All faculty, research staff, administrative staff, and most graduate students have personal computers which are attached to the building's network. Most printers are networked, although classroom printers are reserved for classroom, not administrative or research, use.

Our Digital Morphology Visualization lab became operational in Spring of 2006. The lab contains seven high-end PC workstations running 64-bit Windows operating systems with a suite of specialized 3D visualization and graphical processing software. In addition to paleontology, there are many other potential Earth Science applications of this facility in geophysics, hydrogeology, and other fields. CNS ITAC funding from '05-06 was used to help build this exciting new instructional lab. Products generated through teaching and research in the lab will be used as lecture components in many of our non-major undergraduate courses.

Current and Proposed Funding Sources

Maintenance and expansion of our IT infrastructure is funded by the Undergraduate Instructional Equipment fund, the '06-07 ITAC allocation (see next section), and unrestricted Jackson School funds provided to the Department.

USE OF PREVIOUS ACADEMIC YEAR ALLOCATIONS

The Jackson School received ITAC funds for recurring and infrastructure costs totaling \$78,517 and for special projects totaling \$20,000 for AY '06-07. The table below summarizes our use of these funds. All of the items listed below were included in our proposal.

Jackson School Use of '06-07 ITAC Allocation

<i>Infrastructure</i>	\$78,517
Technology Classroom Maintenance	\$24,000
Classroom deep cleaning (twice x6 rooms)	\$12,000
Department Server Backup System	\$24,000
Document cameras for four classrooms	\$12,000
Computers, monitors for four classrooms	\$7,000
<i>Special Projects</i>	\$20,000
NEC LCD projector for GEO 2.324	\$10,000
Large-format color plotter	\$10,000

NEEDS AND PROPOSED USE OF FUNDS

We are planning for continued but controlled growth in our student population. Most of our technology classroom hardware is more than 4 years old. And as described above, our need for additional IT end-user support is becoming critical.

Special Projects

Renovation of Original Technology Classroom. GEO 2.108 was one of the first technology classrooms to be installed by CNS. The technology in this room is far from standard in appearance and operation compared to other rooms and is now more than 5 years old. The classroom, which contains 21 desktop PCs linked to a server, is in high demand among the geoscience faculty because students can work on computationally complex problems in a classroom setting and receive immediate feedback and help. The renovation will include rewiring the room to install a touchpad for starting the audiovisual system, lowering the screen, controlling the lights, etc., installing a podium-style console to house the equipment, and replacing the projector, document camera, and PC.

Migration of High-End Workstation Lab to Linux. We currently have about 8 SGI workstations that run geophysical visualization and interpretation software. The machines are more than 6 years old and it is not cost-effective to maintain them any more. If we replace them with high-end PCs running the Linux operating system, we can install additional software for climate modeling, finite-element modeling, and other computationally intensive geophysical programs. The lab would become a teaching tool for many more students than it currently serves. We would also need a RAID array to manage the terabytes of data generated by these programs. As part of this transition, we plan to expand the number of available seats to accommodate as many as 24 students at a time.

Recurring and Infrastructure Needs

End-User Support. We are requesting salary and fringe for an end-user support person to provide daily trouble-shooting and operational advice to the nearly 500 users in our department. The ratio of user to available support services is not acceptable for a department of our size and with our level of computationally intensive instruction and research. With the expected continued growth in our undergraduate program, funding for this position is a high priority for us. We plan to contract with ITS to get a part-time person until the end of the August 2007 so that we can try to cover immediate, short-term needs. A dedicated staff person who can provide end-user support will allow our IT manager to engage in long-range planning and will let us serve our faculty and students better.

Annual Maintenance of Technology Classrooms. Outsourcing the daily maintenance of all 19 technology classrooms in the Geology building to the CNS IT group has proven to be extremely cost-effective. The rooms are clean, all of the equipment works, and user satisfaction is very high. When users do have problems with equipment or connectivity, the CNS IT team responds within minutes. We have included this cost in our '07-08 proposal.

Deep Cleaning of Technology Classrooms. On the recommendation of the CNS IT team, we now do have the large classrooms cleaned twice a year. Seat fabric, carpets,

even acoustic wall boards are steam-cleaned and gum and stains are spot-cleaned. It is important that we create a positive atmosphere for all students who enter our building.

Teaching and Student Computer Labs. We would like to initiate a life-cycle replacement program in our student computer labs, and expand the undergraduate lab by adding more desks and computers. Even though many students have their own computers, they use the labs to prepare course assignments as well as posters and presentations for meetings and other professional activities. There is also a networking benefit when the students can congregate in such settings. Some computers in the undergraduate computer lab are hand-me-downs from faculty and staff. While we believe that we provide our students with a superior set of research tools in our labs and classrooms, the dramatic increase in our undergraduate program in fall of 2006 is a signal that we must be prepared for increasing demands on already old hardware. The proposed life-cycle replacement program will help address this.

Classroom Printers. In order to standardize printing for all of our users, we would like to begin a life-cycle replacement program for classroom and teaching lab printers. If we purchase several printers of the same vintage, make, and model then we can realize some economy of scale in purchase of toner and other supplies and standardize the user printing experience.

Software Licenses. The practice of modern geosciences requires us to examine and manipulate many different types of images and data. Our ability to interpret these data relies heavily on computers and specialized software programs. We use dozens of different visualization, modeling, and analytical software programs in our classes. Our students can expect to use these same packages in their professional careers and thus the hand-on experience they receive in class is valuable to them and to the companies that recruit our graduates. Many of these programs are donated or provided to us at low cost, but we are still required to pay yearly licensing and service fees on the more complex packages. We have included the yearly maintenance fees for two of the more expensive packages, ArcInfo and VGStudio Max, as a recurring cost in our request. We use ArcInfo to collect, manipulate, and analyze graphical and map data in lecture and field courses, and VGStudio Max is the principal visualization package that we use in the Digital Morphology Visualization teaching lab.

Room	Classification	Physical	Additional Media
2.102	GP	old wing classroom	connection for laptop
2.108	GEO lab	old wing computer laboratory with card reader lock	VCR, color printer
2.202	GP	new wing classroom; no blinds	connection for laptop, VCR, Mac
2.216	GP	new wing classroom; no blinds	connection for laptop, VCR, Mac
2.218	GP	new wing classroom; no blinds	connection for laptop, VCR, Mac
2.306	GEO lab	old wing classroom	no connection for laptop
2.308	GEO lab	old wing classroom	no connection for laptop
2.310	GEO lab	old wing classroom	no connection for laptop
2.324	GP	new wing lecture hall	connection for laptop, VCR, Mac
3.104	GEO lab	old wing hydro lab	
3.106	GEO lab	old wing paleo lab	
3.108	GEO lab	scope lab	
3.114	GEO lab	scope lab	
3.116	GEO classroom	old wing classroom	
3.120	GEO classroom	old wing classroom	
3.202	GEO classroom	new wing small classroom; no blinds	connection for laptop

3.204	GEO classroom	new wing classroom; blinds	connection for laptop
3.218	GEO classroom	new wing classroom; blinds	connection for laptop
3.222	GP	new wing classroom; blinds	connection for laptop, VCR