

College of Engineering

Vision Plan for Information Technology

2004-2005

(simplified version)

<http://www.engr.utexas.edu/itg/vision/>

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Table of Contents

Executive Overview.....	1
College of Engineering ITAC funding requests for AY 2004/2005.....	2
Appendices:	4
1 – Critical Network Infrastructure Lifecycle Funding needs.....	4
2 – A perspective on IT implementations.....	5

Executive Overview

Engineering continues on its diligent commitment to foster world-class learning through the innovative and appropriate integration of technology into the curriculum.

Engineering leverages the ITAC allocations for visionary IT projects at a greater than 100% matching level.

Our current aspirations (AY 03/04) are to leverage an allocation of \$302,000 with \$419,000 from various sources for a total of \$721K to implement a spectrum of IT projects. Projects include “Real World Classroom” activities for real-time data acquisition and analysis, medical instrumentation and measurement/interpretation of physiological phenomena. Other projects include enhancing collaborative learning spaces (NextGen classroom spaces w/mobile technology) and providing resources as catalysts for learning (universal file space pilot and virtual servers).

- Engineering found it necessary to deploy Virtual Private Network (VPN) and Anti-SPAM capabilities this past fall and is working together with campus partners to determine desirable configurations for these new IT necessities.
- Engineering has been working diligently with the ITS-Internet Security Office and other campus partners to determine an appropriate overarching security model for the campus to adopt and deploy. “Operation Orange-Hat” as it has come to be known needs an infusion of formalization, urgency and resources in order to deliver the productivity protecting security infrastructure needed in the contemporary IT culture.

Broad-spectrum software licensing, such as programs in place with Microsoft, National Instruments, Mentoring tools and AutoDesk continue to contribute greatly to synergistic cultures which are not overburdened with individual license tracking. Maturing anti-virus, adware, spyware, anti-SPAM, software patching/deployment and VPN/Security solutions need to follow-suit.

College of Engineering ITAC funding requests for AY 2004/2005

Project Title	Brief Description	Requested Funding
<ul style="list-style-type: none"> ▪ Team Project Rooms 	<p>Each semester more faculty members are assigning projects to teams of students. This is beneficial because it is a better model of real-world engineering and it gives the students the experience in dealing with group dynamics. While our departments have learning resource centers for student use these are designed for individual, quiet work. The team rooms need to be designed for multi-student collaboration while providing resources conducive to team dynamics, not unlike real-world engineering workspaces.</p>	<p>\$250,000 (multiple centers are envisioned at this cost with some remodeling expenses anticipated)</p>
<ul style="list-style-type: none"> ▪ Next Generation Classroom models 	<p>The existing classroom configurations and infrastructure need to be evaluated and prototypes developed to meet the needs of the contemporary and future classroom. The classroom must:</p> <ul style="list-style-type: none"> • Be laptop, tablet, and PDA friendly • Allow for integration of real-world engineering • Be reconfigurable to support team activities and projects • Include digital whiteboards with capture and publishing features • The ability for faculty as well as individual students to share and display workspace with the entire class • Support high bandwidth wireless access • Provide access to live distributed learning 	<p>\$350,000</p>
<ul style="list-style-type: none"> • Real-world classroom 	<p>The emerging contemporary engineering classroom involves extensive digital data acquisition, distributed sensor networks, network-aware laboratory devices and analysis tools to permit students to see and interpret physical results in real time. These state-of-the-art tools allow students to immediately relate the theory they are learning in the classroom to real materials, devices, and systems. IT resources are critical to Real-World Classroom endeavors. Real-world problem solving involves a hands-on approach to project-oriented instruction. Labs must transcend physical and geographical boundaries on a 24/7 basis. Entrepreneurship and global perspectives often require collaboration with group members located in different countries. In addition, the testing and visualization of models is often done using real-life models created by computer controlled equipment.</p>	<p>\$120,000 (multiple- rollouts)</p>
<ul style="list-style-type: none"> ▪ Secure Communications 	<p>A trusted communications channel between distributed sets of users is needed in order to increase productivity for those who must access official UT and Engineering resources from off-site. State of the art techniques and best practices will be used to create a managed environment to provide secure communications for the following: electronic documents, secure video conference, secure email, secure messaging, secure large file transfers, digital signatures, secure VOIP, authentication and identity management. All campus technologies will be duly leveraged, yet extensions and integration are needed to make these services wholly productive.</p>	<p>\$80,000</p>

Project Title	Brief Description	Requested Funding
<ul style="list-style-type: none"> ▪ Proximate Data Access 	<p>Traditional, centralized data storage is inhibiting the productivity of our nomadic and distributed students and faculty. We need to examine and develop progressive storage mechanisms for high volume data that are accessible, replicatable over various speed networks and affordable. A cascading mesh of high-speed, satellite, near-line and backup/recovery resources are envisioned to deliver the needed capabilities. Additionally there is a growing demand for archival mechanisms to enrich the learning experience and the practical boundaries of these desires need to be defined.</p>	\$250,000
<ul style="list-style-type: none"> ▪ Ethernet over power-lines pilot 	<p>The potential cost-savings for implementing commodity Ethernet and voice over IP utilizing existing electrical wiring in our buildings is simply too significant to not investigate thoroughly. Image if you would that we effectively already have sufficient wiring infrastructure to ALL rooms on campus to deliver these two key services if we simply rework our building telecom closets a bit. We would of course need physical plant and ITS cooperation in this endeavor to both pilot and explore the feasibility of deploying this technology broadly across campus, but the cost saving implications are so significant we are hopeful they would enthusiastically engage (seeds are already being planted).</p> <p>Two sites of potential interest:</p> <ul style="list-style-type: none"> - What is Power Line Communication & how does it work <ul style="list-style-type: none"> ○ http://www.plca.net/whatisplc.asp <ul style="list-style-type: none"> ▪ Please note that notice EarthLink and TXU are members - Broadband Over Powerline is For Real <ul style="list-style-type: none"> ○ http://www.isp-planet.com/business/2004/amperion.html 	\$30,000
Increasingly critical operational imperatives – recurring funding in nature		
<ul style="list-style-type: none"> ▪ Network Funding 	<p>Adequate network funding remains the number one priority of IT funding, and will remain so until consistent funding is identified. (please reference appendix 1)</p>	\$450,000 per year
<ul style="list-style-type: none"> ▪ Security hardening & scaling system management outreach 	<p>Emphasis is on extending securely delivered services and security updates to all college constituents through a set of proactive measures which will optimize resource use and management and protect the productivity of unrecoverable classroom time. A security conscious culture needs to be further developed and equipped with proactive diagnostic tools and properly trained response teams to address security breaches and protect the productivity of our learning activities.</p>	\$150,000 per year FTE and maturation and scaling of initiated pilots
Total:		\$1,680,000

Appendices:

1 – Critical Network Infrastructure Lifecycle Funding needs

Adequate funding for the mission critical network infrastructure remains a crucial concern with the College of Engineering. Historically, we found allocating a portion of the ITAC Vision funds leveraged with College funds necessary to maintain essential networking capability. To transcend this undesirable situation, the College has proposed a Network Lifecycle Model, integrated into our fee structure, to provide for sustained maintenance and necessary expansion of the network. The following table shows the proposed schedule.

Network Infrastructure Lifecycle Funding Budget Overview

Equipment (cost per year on 5 Year Lifecycle) **\$250,000**

Year	Areas Covered (proposed cycle)
Year 1	WRW, CPE-East
Year 2	ECJ, ETC
Year 3	ENS
Year 4	BME, futures/new technology
Year 5	CPE-West, wireless, all building upgrades

All years contain an amount that is non-building specific to cover software, training, tools and additional areas.

Salary (3 Full Time Employees - proposed)

Position	Salary	Annual Salary with Fringe Benefit
Senior LAN Administrator	57,500	73,600
Network and Security Administrator	57,500	73,600
Tech staff	40,000	51,200
Total	155,000	\$198,400

Total per year, nominally \$450,000

Adequate network bandwidth, connectivity and redundancy remain chronic networking issues. While some buildings cannot currently add a single additional connection to their existing infrastructure and struggle to identify funding for expansion, other buildings have a growing concern for single points of failure that could be disastrous for mission critical network infrastructures. All of these concerns converge to the necessity of having a consistent source of network funding as proposed in our lifecycle funding model.

2 – A perspective on IT implementations

- Multimedia Teaching Podiums in essentially all Engineering Classrooms
 - Since 1998, 98 percent of the College's 55 classrooms have been outfitted with multimedia equipment. The effort started that year when five classrooms were brought online per a Vision Plan allocation for projectors to the various departments. Heretofore faculty with multimedia equipment needs had checked out roving carts with projectors and set them up in rooms as needed. A Distance Learning classroom had been in place for some time, meaning just 11 percent of College classrooms had some level of multimedia capability in 1998. In AY 1998-99 and 1999-2000, the College used another Vision Plan allocation to outfit an additional 11 rooms with multimedia equipment. The following year, the Board of Regents approved an increase to a student fee that enabled the College to approach outfitting the classrooms in a more systematic manner and leverage purchasing power in partnership with the Colleges of Liberal Arts and Natural Sciences. Fifteen rooms were accomplished in 2001, 10 in 2002, 10 in 2003 (including two more Distance Learning classrooms), and another 10 will be completed or upgraded in 2004. (The rooms not outfitted are in a state of flux.)
- Wireless Network connections in main campus Engineering Complex
 - Through a generous grant from HP, we have been able to nominally provide wireless Ethernet connectivity (802.11b) to all five of the main campus engineering buildings (implementing approximately 90 access points initially). Subsequently we have enhanced coverage to address specific, identified needs and are currently in the process of deploying 802.11g, a higher speed wireless connectivity, in some high use areas. This connectivity capability rapidly became "expected" as standard fare for Engineering students and faculty and has challenged other parts of campus to bring up such coverage.
- Laptops for Learning Initiative (Desktops and Tablets too...)
 - The laptop initiative is entering its 8th year in the summer of 2004. This program makes it easy and affordable for students to purchase laptops and it also answers many of their questions about what level of technology is currently perceived as appropriate as an Engineering toolset. This past year 508 CPUs (70% laptops, 30% desktops) were sold through the program infusing over \$800K of new technology for use into our students and faculty hands. Anecdotally, we also imagine that several times these numbers of laptops and CPUs were purchased outside the voluntary program, since nearly all Engineering students claim to possess personal CPUs.
 - Pilots are also in place to evaluate the potential Tablet PCs as well (an HP grant has helped facilitate this).
- HP Studio Classrooms (in addition to the LRCs in the departments)
 - Two studio classrooms have been established in Engineering with generous grants from HP over the past several years. Students are using the real-time three-dimensional design, simulation and visualization capabilities that HP hardware delivers to add a new dynamic to the college classroom. Each classroom has twenty-some CPUs and are configured to enhance interaction with both fellow students and the instructor. These studio classrooms have also acted as a catalyst for understanding classroom/IT dynamics and have propelled a number of mobility initiatives, including the further pursuit of laptops and tablets PCs in the classroom.
 - (<http://www.engr.utexas.edu/itg/classrooms/hp1.cfm>,
<http://www.engr.utexas.edu/itg/classrooms/hp2.cfm>)