

Strategic Plan

College of Science

Texas A&M University

2001-2005

Strategic Plan
College of Science
Texas A&M University
2001-2005

1.	Introduction.....	2
2.	The Twelve Imperatives.....	3
	<i>Imperative 1: Elevate Our Faculty and Their Teaching, Research and Scholarship.....</i>	3
	<i>Imperative 2: Strengthen Our Graduate Programs.....</i>	7
	<i>Imperative 3: Enhance the Undergraduate Academic Experience.....</i>	8
	<i>Imperative 4: Build the Letters, Arts and Sciences Core</i>	9
	<i>Imperative 5: Build on the Tradition of Professional Education</i>	10
	<i>Imperative 6: Diversify and Globalize the A&M Community</i>	11
	<i>Imperative 7: Increase Access to Knowledge Sources</i>	12
	<i>Imperative 8: Enrich Our Campus</i>	12
	<i>Imperative 9: Build Community and Metropolitan Connections.....</i>	12
	<i>Imperative 10: Demand Enlightened Governance and Leadership</i>	12
	<i>Imperative 11: Attain Resource Parity with the Best Public Universities</i>	13
	<i>Imperative 12: Meet Our Commitment to Texas.....</i>	13
3.	Conclusion	14
4.	Departmental Plans	15
	<i>Department of Biology</i>	15
	<i>Department of Chemistry.....</i>	17
	<i>Cyclotron Institute.....</i>	20
	<i>Department of Mathematics.....</i>	23
	<i>Department of Physics</i>	26
	<i>Department of Statistics.....</i>	32

1. Introduction

Imperative 1 of the Vision 2020 document defines a quality research university as “a creator, organizer, preserver, transmitter, and applier of knowledge.” It could be easily argued that for some time the College of Science has been the leader at Texas A&M University in “creating and transmitting” basic knowledge.

In terms of creating knowledge, the College of Science has an extraordinary faculty producing 40% of the University’s indirect cost return, two National Academy of Sciences members, half of the University’s distinguished professors, six University Faculty Fellows, a large number of young faculty with a variety of young investigator awards, and a host of faculty who have won important research prizes.

Regarding the transmittal of knowledge, with approximately 12% of the University’s faculty, the College of Science teaches 20% of the semester credit hours for the University. Our faculty have created many innovative instructional materials, particularly in the area of technology-mediated instruction. We have several outside-of-the-classroom programs for our courses, such as special review sessions and other similar activities.

Chemistry and Statistics are among the top few of the University’s ranked departments, and are at or near top-10 status nationally, while Biology, Mathematics, and Physics have made great progress since they were ranked in the second quartile of departments in the last National Research Council rankings.

Over the past four years, we have continued to expand our core research and teaching mission, but have also made great strides in the other three aspects of a quality research university, in particular, the application of knowledge. The College of Science plays a large role in interdisciplinary programs across campus including the new Institute for Quantum Studies, Bioinformatics, Telecommunications, Materials Science and Engineering, the Center for Environmental and Rural Health, a National Institutes of Health training grant led by faculty in Statistics, and a program project grant led by faculty in Biology.

We are leaders not just locally but nationally in the application of technology to instruction both at the undergraduate and the secondary education level. We have initiated several collaborative programs with the College of Education to address the problem of the critical shortage of mathematics and science teachers. These include the Center for Mathematics and Science Education and the new \$10 million National Science Foundation Information Technology in Science - Center for Teaching and Learning in Science.

This strategic plan is a roadmap for maintaining and expanding our core strengths, while expanding our role in more nontraditional activities and continuing to reach out to the rest of the university, state, nation and world to help attain the lofty goals of Vision 2020.

2. The Twelve Imperatives

Imperative 1: Elevate Our Faculty and Their Teaching, Research and Scholarship

Texas A&M University will only be able to achieve the goal of being one of the top 10 public universities by recruiting, rewarding, and retaining the best possible faculty members and by attracting the best possible graduate students. Over the last four years, the College of Science experienced successes and challenges in recruiting and retaining quality faculty members. During 1997-2001, we lost 17 valuable faculty members who accepted offers at other universities that we simply could not match. These losses are caused not only by financial constraints but also several other factors, including partner placement issues, the lack of social and cultural activities locally, and in some cases the lack of university infrastructure.

College of Science Faculty Losses since 9/97					
(does not include tenure decisions, retirements and deaths)					
	Assistant	Associate	Full	DP	Total
Biology		2	2		4
Chemistry	1		2		3
Mathematics	3	1	1		5
Physics			1	1	2
Statistics		2	1		3
Total	4	5	7	1	17

While merit raises over the past four years have been higher than in many other periods of the recent past (a sum of 18% for FY98-FY01 which accounts for almost all the increases in the instructional budgets of the College during that period), in most areas our faculty are seriously underpaid relative to our peer universities.

Instructional Budget	
FY98	\$27,796,768
FY99	\$28,572,204
FY00	\$30,216,395
FY01	\$31,015,961

College of Science Strategic Plan 2001 - 2005

Salaries vs. Peers* 2000-2001						
Department	Rank	Texas A&M		Peer Group		Relative Market
		\$	# of faculty	\$	# of faculty	
Biology	Full	75,179	13	86,716	81	0.87
	Associate	50,667	14	63,736	31	0.79
	Assistant	47,349	5	51,638	22	0.92
	All Ranks	60,107	32	71,181	134	0.84
Chemistry	Full	90,111	33	99,404	178	0.91
	Associate	62,181	3	63,244	43	0.98
	Assistant	52,688	6	53,376	61	0.99
	All Ranks	82,770	42	90,246	282	0.92
Mathematics	Full	79,824	36	89,404	293	0.89
	Associate	53,596	14	64,071	109	0.84
	Assistant	57,046	5	53,223	87	1.07
	All Ranks	71,077	55	79,666	489	0.89
Physics	Full	86,087	29	94,779	255	0.91
	Associate	62,081	6	68,377	48	0.91
	Assistant	58,334	2	58,140	57	1.00
	All Ranks	80,694	37	88,517	360	0.91
Statistics	Full	90,927	13	86,880	78	1.05
	Associate	64,557	4	61,028	26	1.06
	Assistant	58,145	2	56,549	28	1.03
	All Ranks	81,925	19	78,245	132	1.05
Total	Full	84,703	124	92,776	124	0.91
	Associate	55,535	41	64,229	41	0.86
	Assistant	53,553	20	53,697	20	1.00
	All Ranks	74,872	185	82,225	185	0.91

* - Peer Institutions: Colorado State University, Iowa State University, Massachusetts Institute of Technology, North Carolina State University, Ohio State University, Purdue University, University of Arizona, University of Illinois, and University of Missouri

Retaining our top faculty causes salary compression and in some cases inversions which must be addressed. All of these forces lead inevitably to fewer tenured and tenure-track faculty and more, less expensive and less skilled temporary faculty as shown in the next table. While this allows us to teach more lower division undergraduate students, it negatively impacts our upper division and graduate programs as well as our research efforts.

College of Science Strategic Plan 2001 - 2005

College of Science				
Faculty Count 96-97 compared to 2000-01				
Biology				
	Full	Associate	Assistant	Total
96-97	17	14	6	37
00-01	15	14	5	34
Chemistry				
	Full	Associate	Assistant	Total
96-97	41	4	5	50
00-01	36	3	7	46
Mathematics				
	Full	Associate	Assistant	Total
96-97	43	22	5	70
00-01	44	16	8	68
Physics				
	Full	Associate	Assistant	Total
96-97	33	5	1	39
00-01	33	6	1	40
Statistics				
	Full	Associate	Assistant	Total
96-97	14	7	3	24
00-01	17	5	3	25
Totals				
	Full	Associate	Assistant	Total
96-97	148	52	20	220
00-01	145	44	24	213

This table actually reflects a loss of 45 faculty members, which was offset by the recruitment of September 1997 through August 2001. Of these 38 new faculty members, 7 were tenured faculty who were already well respected in his or her fields. Additionally, 31 junior faculty, many in exciting new fields of study, joined the College.

College of Science Faculty Hires since 9/97				
	Assistant	Associate	Full	Total
Biology	3	1	2	6
Chemistry	6		1	7
Mathematics	11		2	13
Physics	4	1		5
Statistics	7			7
Total	31	2	5	38

Faculty in the College of Science have been very successful in receiving national and international recognition over the last four years. Most recently, Dr. Marlan Scully was named to the National Academy of Sciences. College of Science faculty have received over \$22 million in research funding per year and have won six University Level Distinguished Teaching Awards and seven University Research Awards from the Association of Former Students in the last four years.

College of Science Strategic Plan 2001 - 2005

Research Awarded				
	FY97	FY98	FY99	FY00
Biology	4,077,999	3,227,788	4,155,054	5,069,883
Chemistry	10,397,119	6,906,721	9,307,890	9,757,627
Mathematics	2,748,889	1,306,906	1,982,948	3,555,921
Physics	4,642,650	5,230,614	3,998,263	6,450,920
Statistics	887,110	484,472	583,567	1,000,331
Cyclotron	421,675	2,243,000	4,697,500	2,890,450
Total	23,175,442	19,399,501	24,730,222	28,725,132

Over the next four years, the goals for the College of Science are:

- 1) to provide an environment where teaching, research and scholarship are rewarded by providing the infrastructure necessary to allow faculty to focus on their strengths,
- 2) to maintain its high teaching load while continuing to expand its role in research and service,
- 3) to help with matching requests for research and to provide connections to other colleges in order to facilitate interdisciplinary research,
- 4) to secure the resources necessary to recruit and retain faculty by helping with searches for excellent junior faculty and superior senior faculty members, and
- 5) to work with the departments, the Dean of Faculties, and the Provost to provide retention packages to keep our most promising faculty members.

The Provost's series of Next Steps Initiatives based on new AUF funding from Proposition 17 is one way we plan to expand and strengthen our faculty and graduate students. So far, six of our faculty have been chosen as University Faculty Fellows of the 25 in the first two rounds, eight of the 32 new faculty positions and a similar number of graduate students have been allocated to the College of Science, and perhaps one-third to one-half of the funds from the Life Sciences and Telecommunications and Informatics Task Forces have been awarded to the College of Science.

Our development efforts have expanded over the past few years. Mostly this increase has occurred in the area of endowed chairs for faculty, where we have received five chair matches from the Bright matching program. We have received approval for two chairs from the AUF funds, and we have several others under discussion.

Gifts Received	
FY98	\$ 1,871,075
FY99	\$ 1,177,021
FY00	\$ 1,604,847
FY01	\$ 3,196,757

It is with such interdisciplinary and development efforts which will enable us to grow in size and quality.

Imperative 2: Strengthen Our Graduate Programs

Texas A&M University and the College of Science are hardly alone in facing the shortage of well-qualified students seeking graduate degrees. Despite extraordinary efforts both in faculty time and financial resources, we continue to struggle to attract the quality and quantity of graduate students needed to bring our research and teaching programs to the levels to which we aspire.

The College is seriously underfunded in the area of graduate assistant (GAT and GANT) support. In most of our areas, stipends are \$2,000-\$4,000 per year behind our peers, while the lack of tuition waivers penalizes our students another \$3,000-\$4,000 per year relative to our peers. These financial considerations and the 99-hour cap cause significant public relations problems in recruiting both American and international students.

This problem now negatively impacts the College in many ways, perhaps most damaging in the area of faculty recruiting. Prospective faculty are often disheartened both when they discover what we are forced to offer our graduate students and in some cases by an inadequate pool (both in quality and quantity) of students to assist in their research.

Until the problem of woefully inadequate funding for graduate students is solved, there is little hope for significant progress in the other imperatives, particularly in elevating our faculty.

The College of Science is committed to doing all we can to overcome these difficulties. For example, we are using graduate enhancement funds to reimburse students who are making progress toward their Ph.D.'s but are penalized by the 99-hour cap. This past year, the College devoted \$200,000 of instructional reserves toward providing "signing bonuses" for top American students. We also have devoted other funds toward tuition remission for some top student recruits. The College will continue these and other actions in this critical area, but the University as a whole must somehow find a way to alleviate this problem.

Graduate Majors - Fall Semester						
	BIOL	CHEM	MATH	PHYS	STAT	Total
1997	105	234	92	112	66	609
1998	109	220	100	117	62	608
1999	111	235	108	113	72	639
2000	98	227	112	104	87	628

Note that the figures for Biology, Chemistry and Physics show a continuing decline that has been ongoing for several years mirroring national trends.

College of Science Strategic Plan 2001 - 2005

The College of Science also plays an important service teaching role for graduate students, particularly the Department of Statistics as shown by the following table.

Graduate – Semester Credit Hours - Fiscal Year						
	BIOL	CHEM	MATH	PHYS	STAT	Total
FY97	837	2,158	1,329	992	1,866	7,182
FY98	892	2,023	1,428	1,058	1,706	7,107
FY99	744	2,107	1,321	1,020	1,604	6,796
FY00	759	2,083	1,440	914	2,016	7,212

Imperative 3: Enhance the Undergraduate Academic Experience

The College of Science plays a central role in the undergraduate academic experience both because of its huge service teaching role and its majors programs. Over the past four years, we have continued to devote increased faculty and funding to enhancing our instruction in service courses, particularly in the use of technology-mediated instruction, and in providing resources for outside-of-the-classroom programs for students.

Undergraduate Semester Credit Hours - Fiscal Year						
	BIOL	CHEM	MATH	PHYS	STAT	Total
FY97	15,344	19,595	35,688	10,544	4,835	86,006
FY98	16,541	22,053	39,698	12,700	5,183	96,175
FY99	15,953	21,855	36,879	13,770	5,299	93,756
FY00	16,653	21,814	36,522	13,730	5,643	94,362

The table above shows a large increase in our teaching over the past four years, which we have accommodated by supplementary funding from the University, but we are concerned such funding may not always be available.

Our total number of majors increased from 1,759 to 1,853 over the past four years and each of our departments is working hard to expand this further. Physics is working with the College of Engineering to create an engineering/physics degree, Mathematics and Statistics continue to add attractive options to the Applied Mathematics degree, Chemistry is expanding the role of research in its major to help attract more students, and Biology is developing courses and options in exciting new areas, including genomics and bioinformatics.

Undergraduate Majors - Fall Semester					
	BIOL	CHEM	MATH	PHYS	Total
1997	1236	177	278	68	1,759
1998	1355	179	282	79	1,895
1999	1336	181	298	74	1,889
2000	1306	167	298	82	1,853

Of course, one difficulty in increasing the quantity and quality of our majors is the lack of competitive scholarships for prospective students. Our External Advisory & Development Council recently took on the challenge of securing contributions totaling \$200,000 for a scholarship matching program.

Perhaps the part of the undergraduate experience in the College of Science that we are most proud of is the opportunity for many of our majors to gain true research experience. Chemistry and Mathematics have federally funded Research Experiences for Undergraduates (REU) grants for this purpose. Biology, Physics, Statistics, and the Cyclotron Institute have many faculty members who include undergraduates in their research projects and pay these students with their grant funds.

Imperative 4: Build the Letters, Arts and Sciences Core

Clearly, the College of Science is anxious to assist in this imperative, particularly in strengthening the science core of the University. Additionally, we are very supportive of building the letters and arts core, by collaborating on research and teaching activities with the College of Liberal Arts and the College of Geosciences. One example of this collaboration that has been developed over the past four years is the creation of a Bachelor's degree in telecommunications media studies. In this program, students take courses in mathematics and science while taking media courses from the College of Liberal Arts. Another example is the collaboration of Psychology and Biology in the interdisciplinary Faculty of Neuroscience, which is developing a Ph.D. program.

The Task Force for Strengthening the Arts and Sciences put forth recommendations that the College of Science fully supports. We list the first general recommendations for the three Colleges: Liberal Arts, Geosciences and Sciences.

1. Retain key senior faculty – Retain key senior faculty by allocating an additional 5% to the merit increase pool for each of the next three biennia. These funds should be distributed to the most productive faculty of the Colleges of Geosciences, Liberal Arts, and Science.
2. Recruit the best people – Recruit the best people at all levels – Deans, Department Heads, faculty members and graduate students – by establishing higher standards, and providing competitive salaries, and providing adequate start-up funds. Provide additional resources to the three Colleges for recruitment, including start-up funds for new faculty members.
3. Increase the number of endowed chairs – To strengthen the arts and sciences and retain and recruit the best faculty, there needs to be an increased number and broader distribution of endowed chairs.
4. Increase the number of faculty members – The number of faculty members in each of the three Colleges should be brought to the 1990 level within the next three years (2001-2003).

College of Science Strategic Plan 2001 - 2005

During the following three years (2004-2006), the total should be increased by an additional 10%.

5. Provide incentives to recruit the best graduate students – Take appropriate action to increase graduate student stipends from available University funds and new legislative appropriations. Take initiative with The University of Texas at Austin and other research universities to gain legislative approval for eliminating the 99-hour cap for doctoral students and providing tuition remission for supported graduate students.
6. Provide adequate funding for service teaching – Departments should be funded at levels commensurate with Texas A&M's peer institution for the teaching of service courses.

Goals that the Task Force outlined that were specific to the College of Science are:

1. Increase research laboratory space – In addition to equipment, laboratory space is a necessity for researchers in the College of Science. The College needs more space, particularly in strategic initiative areas, with special emphasis on space in the new life sciences building.
2. Provide funds for research instrumentation and technicians to operate them – Funds are needed to upgrade the hardware required to keep pace with technology and, in some cases, funds also are needed to expand the staff to operate the hardware and its supporting software. Ultimately, there should be a stable source of funding so that staff and operating expenses are part of the usual University budget. In addition, a systematic method should be developed for selecting a new service for support and the overall administrative organization and administrative responsibility for facilities needs clarification.

The College of Science strongly support the initiatives that are being developed by the Vice President for Research in this area.

Imperative 5: Build on the Tradition of Professional Education

The College of Science has a long tradition of providing strong support for the University's professional programs. At both the undergraduate and the graduate level our extensive service teaching commitment is designed to ensure access to education for all students at Texas A&M University. This commitment remains one of the cornerstones of our mission. In addition, we are committed to maintaining and expanding our tradition of strong interdisciplinary research. Much of this research involves faculty within the various professional programs on campus.

Imperative 6: Diversify and Globalize the A&M Community

The past four years have seen remarkable progress in some areas of diversifying our faculty and students, with less success in others. We have a net increase of 7 women faculty. Physics and Statistics promoted women to full professor for the first time this year.

Female Tenured and Tenure-Track Faculty, 9/01				
	Assistant	Associate	Full	Total
Biology	1	4	2	7
Chemistry	1	1	2	4
Mathematics	2	1	1	4
Physics			1	1
Statistics	5		1	6
Total	9	6	7	22

Minority Tenured and Tenure-Track Faculty, 9/01				
	Assistant	Associate	Full	Total
Biology	1			1
Chemistry		1	1	2
Mathematics	2	2	1	5
Physics				0
Statistics				0
Total	3	3	2	8

Unfortunately, because of the Hopwood decision and the current lack of a critical mass of minority faculty, there are few obvious ways the College can attract minority faculty. However, each of our departments has pledged to ensure that the pool of candidates for their searches will be as diverse as possible. This will include (to the extent possible) the tracking of all minority Ph.D.'s nationally.

The College of Science has been very successful in winning University Diversity Awards. We have won 3 individual awards and 3 out of our 5 departments have won the departmental award.

A number of surveys (including one in the *Hispanic Outlook*) have placed our departments at or near the top nationally in the production of minority doctorates. Thus, we have been a national leader in expanding the diversity of applicant pools nationally.

The College has increased the number of outreach activities to high school students (including minorities) particularly programs such as the NASA SHARP Plus program which brings outstanding (mostly minority) high school students from around the country to work in faculty laboratories for eight weeks in the summer.

College of Science Strategic Plan 2001 - 2005

In terms of globalization, faculty in our College are from all over the world, and are internationally known and respected. Not only do our faculty bring international visitors to Texas A&M, both faculty and graduate students present their research all over the world. We are actively looking for ways to provide expanded international experiences for our undergraduates.

Imperative 7: Increase Access to Knowledge Sources

The College of Science is a leader on campus in the area of using technology in its courses and research. We have supported the University Digital Library financially, and hope to see such efforts expanded.

Imperative 8: Enrich Our Campus

The College of Science has argued in every way possible that because of the increasingly interdisciplinary nature of academia, Texas A&M must do all it can to avoid having the sheer size of its campus inhibit our activities. The best example of this is that life sciences are spread over four colleges and a wide area of campus. A building which houses many of these activities must be built, and it must be placed in a central area of the campus, perhaps just east of Wellborn Road near the bell tower.

Removing the divisive nature of the railroad tracks and improving transportation on campus are necessities for allowing the interactions of faculty and students from different colleges.

Imperative 9: Build Community and Metropolitan Connections

Texas A&M University is clearly an important resource for the local community, as well as the state. Through increased civic interaction individuals can, and have, given back to the cities that support the University. In addition, through the transfer of knowledge to the local community we can improve the intellectual and economic vitality of our area. The most effective manner in which we can help in this initiative is through providing scientific and mathematical expertise to local industry.

Once again, our K-12 outreach activities have built connections with school districts all over the state which bring great credit to our College and to Texas A&M. Examples of outreach activities include summer workshops for high school AP teachers, collaboration with high schools to improve professional development, and many outreach activities for junior high and high school students, including science fairs, science bowls, roadshows, and conferences.

Imperative 10: Demand Enlightened Governance and Leadership

The College of Science has been very fortunate to have a good mix of strong leadership in our departments with a high degree of faculty input in decision making. There appears to be a strong

feeling of collegiality among departments and with the Dean's Office. The Faculty Advisory Council has provided solid input in a variety of difficult areas, particularly in graduate student funding. The College has maintained its very high standards in hiring, tenuring and promoting, and is committed to continuing these high standards.

Imperative 11: Attain Resource Parity with the Best Public Universities

Resource parity is the single largest impediment to achieving the goals outlined in Vision 2020. Our College is teaching more students, has received a large number of large federal grants, has entered into numerous interdisciplinary research efforts, has developed joint appointments with other system parts such as the School of Rural Public Health and has taken on editorial responsibilities for leading journals, all without effectively increasing the funding, the number of faculty, and space required for these efforts. With the additional faculty lines from the recent AUF competition, and any potential new hires generated by increased teaching efforts, our departments will be forced to make decisions which could easily hinder our ability to become improve our national visibility.

The College's increased teaching efforts are also hampered by lack of access to appropriate teaching space. It has become increasingly important that the University provide high-tech classrooms capable of both increased student interaction and web-based learning support. To be able to meet the increased teaching demands of the undergraduate student population, we also need access to larger classrooms. With such access, we will still soon exceed our teaching capacity, but without it we already have. The recently instituted laboratory and equipment access fees have greatly helped equip classrooms, but we must have access to the correctly sized and shaped classrooms.

The University's recognition that leading scientific problems are naturally interdisciplinary brings to the fore another issue. Interdisciplinary collaboration requires improved jointly accessible space. Initiatives such as the new life sciences building will be extremely important if we are to succeed in these initiatives.

Finally, all of our departments - already underfunded relative to peers - have lost faculty and have been forced to respond to too many outside offers over the past five years. Salaries for our leading researchers must be on par with national trends if we are to stay competitive. If not, we run the risk of becoming a training ground for better funded institutions.

Imperative 12: Meet Our Commitment to Texas

Most people would agree that the education of the state's population is the most visible service the University can provide to its citizens. Providing the best quality education in the most efficient and timely manner allows this benefit to have maximal value. The College of Science has always strived to teach as many students as is possible in all its classes. We never neglect our responsibility to provide seats in our classes. We have also maintained a large summer

program to ensure students access to courses outside the normal cycle. We view this effort as our most obvious way of supporting the needs of our students. As the University continues to struggle with increased enrollment and as our community grows, new teaching options will need to be found. To that end, we are beginning to discuss non-standard time patterns and increased web-based teaching formats. We are also beginning to explore ways in which our resources can be used to enhance the educational resources of other institutions within the Texas A&M University System.

Texas A&M was founded on the traditions of a land grant institution. Our departments have a strong tradition of collaboration with many departments such as those in the Colleges of Agriculture and Life Sciences, Education, Engineering, Geosciences, Medicine, and Veterinary Medicine.

Our basic research helps drive the economy of Texas. Our outreach efforts bring the message of higher education to people all over the state. Our extensive teacher training programs including the Mathematics and Science Scholars Program (MASS) are helping to relieve the critical shortage of mathematics and science teachers.

4. Conclusion

The goals of the College of Science are quite simple. We must maintain our core strengths in the basic laboratory and mathematical sciences, while reaching out to the University in interdisciplinary activities. This can only be done by the three R's: recruiting, retaining and rewarding outstanding faculty. We must enlarge our graduate programs and constantly monitor and expand our undergraduate programs.

We need a great deal of help from the Texas Legislature and the University. The University must find funds commensurate with our efforts. We must have more space, both laboratory space and appropriately-configured teaching space. We need help selling the state on the value of graduate training and research. The University must recognize the costs associated with running new programs and help find ways to fund such activities.

With the teaching demands so high for the service courses, we fear departments may not be able to enter into creative new ventures. Interdisciplinary faculties have built-in conflicts with colleges that must be addressed in order that every group is treated equitably.

We feel that the list of major research initiatives resulting from the previous university strategic plan (life sciences and telecommunications) must be expanded to include nationally important areas such as innovative materials science and engineering, nanoscale science, and computational science and engineering where Texas A&M can build on its current strengths.

There is much we can do on our own. We will redouble our research and development efforts to help generate funds for graduate students, scholarships for undergraduates and faculty endowed chairs. We will continue our search for efficiencies. The next four years should be an exciting time.

5. Departmental Plans

Department of Biology

Introduction

The mission of the Department of Biology is to provide high quality education in biological sciences to our students, to advance the body of scientific knowledge through scholarly research, and to provide technical and educational expertise locally, nationally and internationally. This mission can only be achieved through the recruitment, retention and support of the highest quality faculty, staff and students.

The Department of Biology plays a central role in the university by providing fundamental lecture and laboratory courses introducing biological principles to students majoring in agriculture, architecture, business, engineering, geosciences, liberal arts, science and veterinary medicine. We also provide modern and comprehensive B.S. and B.A. curricula in Biology, Botany, Cell and Molecular Biology, Microbiology and Zoology for more than 1300 undergraduate majors.

Our graduate programs prepare scientists for careers in academia, industry and government and play an essential role in enhancing an understanding of the central role of biological systems in the global environment. Our faculty also provide expertise outside the university in service on scientific advisory and editorial boards, in evaluation of scientific publications and proposals, in informing the public schools and general public about scientific innovations and the importance of biological systems to society, and in helping Texas and the United States meet the challenges of the future.

Departmental Goals

The Department recently conducted an in depth self-study for a review of our doctoral programs. The results of the self-study and responses to this review presented within the context of Vision 2020 Imperatives constitute the Strategic Plan of the Department of Biology

Elevate faculty and their teaching and research. We must recruit and retain the best faculty. Significant new funds for faculty salaries, as well as start-up packages, are required for successful faculty recruitment and retention. We are confident that our programs can grow and compete with the best biological science departments in the nation if the resources are made available to mount a legitimate effort. To meet our graduate and undergraduate teaching needs, it will be necessary to increase our faculty FTEs to 40 by 2005 and 45 by 2010.

In the short term, it is necessary to improve the infrastructure of Biology to retain our current faculty and to recruit new members. We require immediate and extensive renovation of the existing Biology buildings, a project that will involve the remodeling of three laboratories per year until completion. Longer term, because a strong Biology department is an integral part of any top-tier, research university and such a status for Texas A&M is envisioned by 2020, we

College of Science Strategic Plan 2001 - 2005

require a new Biology Building to consolidate all of our teaching and research programs. We will work with the administration to accomplish this goal.

Strengthen graduate programs. We must increase the quality and number of our graduate students. To do this, we must increase graduate student stipends to a level that is competitive with peer institutions. We must significantly increase the GAT/GANT budgets of the Department of Biology so that we can offer a competitive stipend to our graduate students both present and future. We consider \$19,000 per year to be a competitive stipend for graduate recruiting and retention. This stipend is similar to that of the Department of Biology at the University of Michigan where a full tuition waiver is provided.

We must develop mechanisms to defray all or most of the tuition and fee costs borne by graduate students. The Department of Biology encourages the administration of Texas A&M to work to eliminate all tuition, by wavier or remission, for all biology graduate students. Since our peer institutions provide tuition waivers, the Department of Biology will identify mechanisms to defray tuition for our students. If such mechanisms prove to be unattainable, additional increases in stipend will be necessary to be competitive.

We must develop mechanisms to minimize any adverse effects of the 99-hour cap, so it does not impact negatively on graduate student and faculty recruiting. Because the 99-hour cap has a detrimental impact on graduate student and faculty recruiting and morale, we encourage the administration of Texas A&M to work on behalf of our Biology graduate students to identify mechanisms to alleviate this problem.

A graduate program is only as good as its faculty. In order to enhance our graduate curriculum, without creating a negative impact on our undergraduate teaching program, it will be necessary to increase our faculty FTEs to the levels previously mentioned and as recommended by the both the internal and external reviewers.

Enhance the undergraduate academic experience. The surest way to enhance the undergraduate experience is to recruit and retain the best faculty and to maintain an educational and research infrastructure that allows innovative, multimedia delivery of course materials and allows participation of undergraduates in the research enterprise. We need to develop courses that integrate genomics and bioinformatics with the fundamental biological problems of molecular, developmental, integrative, including neuroscience, and evolutionary biology.

Meet our commitment to Texas. The Department of Biology meets its commitment to Texas by training undergraduate and graduate students in state-of-the-art life sciences. These students are well trained so that they can enter the Texas workforce in the private and public sectors. Furthermore, our faculty provide expertise outside the University in service on scientific advisory and editorial boards, in evaluation of scientific publications and proposals, in informing the public schools and general public about scientific innovations and the importance of biological systems to society, and in helping Texas and the United States meet the challenges of the future.

We can be more effective at meeting our commitments to Texas, but Texas A&M must encourage and facilitate the entrepreneurial efforts of its faculty and students. Barriers must be removed so that ideas conceived at the lab bench can be further developed as new products or businesses, the latter preferably located in Texas. We need a local incubator to facilitate this process.

Department of Chemistry

Introduction

The current reputation of the Chemistry Department (ranked in the top 10% of Ph.D. granting programs) is a precious asset to the University which must be maintained and developed. Chemistry is one of the areas where Texas A&M has a clear competitive advantage. To best serve the interests of our State and Nation, the University must build on these areas of strength.

Evaluations of current program performance and faculty

Faculty

We currently have on the payroll 44 tenure track/tenured faculty; 13 (30%) of the faculty are 60 or older. One can reasonably expect a surge of retirements over the next ten years. An aggressive replacement strategy must be pursued to maintain the Department's reputation. In the last three years, five faculty have been hired and six chairs have been established.

Instruction

The Department of Chemistry plays a major role in the University's education programs at both the undergraduate and graduate levels, ranking behind only Mathematics and English in total course load. The high enrollment first and second year courses are required for a very large number of degree programs. A continuing priority is the quality of instruction in the service courses. The key here is to achieve more effective use of the faculty. This cannot be done by increasing teaching loads.

The Chemistry Department has made several significant efforts in recent years to improve our service course offerings. Faculty in the Department developed Chemistry 107 lectures that are coordinated with specific laboratory sections where students receive more personalized and individualized instruction. The Department has also introduced very successful freshman and sophomore chemistry honors courses that cater to high achieving undergraduate students in a wide spectrum of majors. The faculty needs reinforced support for recitation, supplemental, and

College of Science Strategic Plan 2001 - 2005

computerized instruction and logistics to continue to innovate in our efforts at undergraduate education.

Our current graduate enrollment totals 197 students: 112 domestic students, 6 students from Canada or Mexico, and 79 international students (countries of origin include France, Belize, Russia, Sri Lanka, India, Malaysia, China, South Korea, Costa Rica, Philippines, Greece, Italy, Egypt, Taiwan, Thailand, and Syria). The program is one of the largest in the nation and is highly regarded. Essential to its continued success and still increased recognition is our ability to retain and/or replace outstanding members of our graduate faculty. The placement of our graduate students in desirable positions in industry and academia has been very successful and is an external indicator of the past and current success of our program of graduate instruction. Future success in these efforts is expected but will be highly dependent on our ability to attract very high quality U.S. graduate students into our program from a market that is increasingly competitive.

Postdoctoral students are an important part of the Department's research and teaching activity. While the role of such students in research laboratories is not a formally recognized teaching function, it is important that the University continue to recognize both the role and needs of such students and the role of the Department in educating such students.

Research

The prominence of the Chemistry Department is clearly evident in the volume of its research activities. In 1999, total research support from federal, state, university, private and industrial sources totaled \$11,497,736. This amount included \$1,814,571 in overhead funds. The challenge ahead is to compete for research support in an environment with shifting federal R & D priorities. Our response must be to reinforce our strengths and focus those on opportunities in the invention of new and useful chemical reactions, compounds and materials, catalysis and surface science, chemistry of life sciences (bio-organic, bioinorganic), chemical separation and characterization, nuclear chemistry, and chemistry of the environment.

Outreach

The Department has an active industrial affiliates program. Membership has increased from 4 to 12 companies in the past 18 months. The "Industry-University Cooperative Chemistry Program" sponsors scholarships, graduate fellowships, a Progress in Chemistry publication series, an annual graduate research symposium and a special topics symposia (pharmaceutical chemistry; catalysis). A growing role for the IUCCP is to help the Department tap into the industry trend of outsourcing R & D.

Strategic plan - progress towards the goals of vision 2020

Faculty Development (Vision 2020 Imperative 1)

College of Science Strategic Plan 2001 - 2005

We need approximately two new faculty per year (junior and mid-career) to maintain a broadly diversified and competitive chemistry program. In this context, two challenges must be met: retention of successful faculty and improving our average quality with each new hire. Thus, our priorities are: start-up funds for two new faculty per year, matching funds for new shared instrumentation, and budgetary provision for annual salary raises and equity adjustments.

A key concern is the enhancement of the research competitiveness. Developing and maintaining major research infrastructure capabilities which provide essential support of the department's (and the University's) academic research programs must be a priority goal of the present strategic plan. Such capabilities provide the essential underpinning of these programs and, properly supported and utilized, greatly enhance our ability to carry out high-level competitive research and obtain extramural funding. The Department of Chemistry has often taken a lead role in establishing and supporting infrastructure facilities within the Department that are useful to the broader campus community. While this infrastructure has been partially funded by the Office of the Vice President for Research, the long-term funding of facilities critical to the function of the science-oriented programs is unclear and is currently a burden to the Department of Chemistry.

Graduate Program (Vision 2020 Imperative 2)

Our enrollment goal should be ~300 students, which requires ~70 new students each academic year. A realistic ratio of international/domestic students is 1/2 and thus the international students in residence at any one time should be capped at ~100 students, while the number of domestic students increases to ~200. A key priority besides recruiting high quality students is to obtain tuition waivers or funds to pay the tuition for domestic students. Other impediments to competitive recruiting, such as the 99-hour cap rule and the minimum number of credit hours to be a full time student, must be revised. Concerted efforts must be made to enlarge the number of externally funded training grants and summer research programs for undergraduate students.

Undergraduate Program (Vision 2020 Imperative 3)

Our objective is to enhance the efficiency of our educational programs in order to supply a better experience to our students without greatly increasing the cost. We assume that enrollments will remain level. Although a decrease in class size is desirable, this goal is unrealistic due to the cost associated with the concomitant requirement of a larger number of faculty in chemistry. Increased effective use of technology can help improve the level of communication within the framework of the large lectures now required by current student enrollment. A move toward TV-lectures given by one or two excellent faculty members, coupled with increased use of small recitation sections led by well-trained teaching assistants, could reduce the number of faculty devoted to teaching very large (>250 student) lecture sections and free some faculty for additional sections of honors or specialized courses, which, by design, would be kept below 50 students.

Our goal should be to have 250 chemistry majors by 2005. We currently have 195. A significant increase in chemistry majors requires a combination of increased recruiting,

College of Science Strategic Plan 2001 - 2005

modifications to degree plans for BS/BA students, and some guaranteed financial assistance for qualified chemistry majors. We plan to adjust our present course inventory with renewed emphasis on student research and expanded offerings of advanced and honors courses to make the program more attractive to a larger number of students. Additional flexibility within the degree plans to allow students greater opportunities for cooperative education, study abroad, and semester-long internships is desirable. Guaranteed financial assistance of, for instance, \$1,000/year/student for students with GPA > 3.0 and no other major scholarships, requires more scholarships from IUCCP and a scholarship drive among our former students (part of the upcoming capital campaign). A three-fold increase in the number of scholarships from IUCCP and increased emphasis on scholarships for undergraduates from faculty Welch grants are planned. This, when coupled with additional support of upper-level chemistry majors without scholarships as teaching assistants and supplemental instruction (SI) leaders, should allow us to provide financial assistance of at least \$1000 per year per student for most students who do not hold other major scholarships.

Outreach (Vision 2020 Imperative 6)

Our interactions with primary schools and secondary school chemistry teachers are carried by several enthusiastic members of the department. As a department, we will strive to increase our offerings of courses, workshops, and open houses for pre-college teachers and/or their students and support efforts to enhance teacher preparation. One of the first items to address is finding funds to cover the tuition for high school teachers to sign up for courses designed for them and for a GANT to handle the Road Show.

Our REU program started in the Summer 2000 and involved 18 undergraduates (including two from Mexico). The program is funded for three years by NSF for 9 students each summer. Enrollment was doubled last year with support from the College of Science, the Chemistry Department and Chemistry faculty. The REU program has helped attract new graduate students and through a contact with Monterrey Tech provides a means to enhance diversity. As a consequence, the supplemental funding will be maintained for the Summer 2001 program. We will seek to further expand the REU program in subsequent years.

Cyclotron Institute

Current Program

The Cyclotron Institute at Texas A&M University is a major technical resource for the State of Texas and for the nation. It is one of only two super-conducting cyclotron laboratories in the country. Internationally recognized for its research contributions, the Institute is the primary experimental facility for the University's graduate programs in nuclear chemistry and nuclear physics. Approximately ten percent of the active research faculty in the Chemistry and Physics Departments work in the Institute. A significant number of graduate students, undergraduate students and post-doctoral fellows are involved in Institute programs. Continued development

College of Science Strategic Plan 2001 - 2005

and diversification of this very important infrastructure facility will keep it internationally competitive and allow it to play a significant role in the future national nuclear science program. Institute plans are directly in line with the first three stated imperatives of the Vision 2020 plan, i.e., "Elevate Our Faculty and Their Teaching, Research, and Scholarship", "Strengthen Our Graduate Programs" and "Enhance the Undergraduate Academic Experience".

The primary missions of the Institute are in the areas of:

1. Fundamental Research and Graduate Education

The Institute is a Department of Energy supported university accelerator facility. Though dominated by the in-house programs at the TAMU K500 super-conducting accelerator, the research also includes projects in which the Institute serves as a technological base and staging area for the preparation of experiments to be carried out at larger unique national or international facilities such as the new U.S. Relativistic Heavy Ion Collider which began operation in 1999. Many of the local programs involve collaborations with other laboratories in Italy, France, Belgium, Japan, Russia, Ukraine, The Czech Republic, Poland and Mexico.

The research programs are regularly reviewed by external scientific committees appointed by the DOE. The most recent external review states that the Institute "promotes and facilitates a rich and diverse set of research opportunities/activities which are clearly an asset to DOE's and the nation's nuclear physics program." The Institute's principal research programs are described as "of very high caliber," as producing "the best data of its type which has ever been published, by a considerable margin," and "at the forefront." As a result of such reviews the Institute has received a succession of three-year grants with steady increases in funding. This, at a time when DOE funding was essentially flat and some other grants were reduced or terminated.

2. Applications of Accelerator Technology

Approximately 20% of the accelerator time is used to provide heavy ion beams to a number of industrial and university groups for materials testing and modification. Recent industrial users include NASA, Boeing, Motorola, JPL, The Naval Warfare Laboratory, McDonnell Douglas, Lockheed, Ranger Scientific and Matras Marconi. Recent University users include the Electrical and Nuclear Engineering Departments and Prairie View A&M University.

This year we will submit a new three year proposal, requesting ~ \$ 8,000,000 in new funding from the Department of Energy (DOE). While we are confident of the scientific case for continued funding of this program, we note that the maintenance of appropriate base-line funding from the university, appropriate technical staffing and graduate student support are key elements in assuring continued success in the competition for funds.

Upgrade Plan

Over the past two years Cyclotron Institute faculty and staff members have been actively investigating possible facility upgrades which would expand the opportunities for both fundamental and applied accelerator based research at the Institute. This is a key part of our

strategic planning and is intended to assure that the facility remains an important national and international laboratory well into the new century. Based on our investigations we have concluded that we can accomplish a very significant upgrade of this facility by re-activating our second accelerator, the 88" cyclotron, primarily for use as a driver for production of rare isotopes for re-acceleration in the K500 Cyclotron. That accelerator was "moth-balled" in 1989 when the new accelerator began operation. The broad range of stable beams and expanded range of rare beams available from the upgraded facility would significantly extend our research capabilities as a stable beam facility with a moderate rare beam capacity and would occupy a very important niche in the world's accelerator based research capabilities, supporting research into a broad range of interesting, but previously inaccessible, phenomena. In addition the facility would be positioned to play a much wider role in support of the national accelerator based scientific research effort. It could prove to be very useful for early testing of techniques to be employed in the Rare Isotope Accelerator, recently designated as the highest priority for new construction in the national Long Range Plan for Nuclear Science.

Such an upgrade is well within our technical capabilities and could be realized within two years of being funded. Over the next year we will be evaluating various technical approaches to such an upgrade, starting with exploration of the utility of a super-conducting solenoid which has just been received on long term loan from the University of Michigan. We expect to be ready to submit a complete proposal to DOE in approximately one year. Many details regarding this upgrade, including new power supply requirements, changes and additions to the beam line system, possible increased requirements for total building power and renovated cooling tower capacity, etc. are still being explored. Therefore we have only *preliminary* cost estimate of \$5,000,000 at the present time. A significant matching contribution from TAMU, ~ \$1,000,000 would be required.

Program Concerns

The primary concerns of the Institute faculty as they attempt to carry out the Institute mission are in the areas of the University's base line operations funding, staffing and graduate student support.

1. Funding and Staffing Levels

Since its creation in 1964, the Institute has been quite successful in obtaining significant external grant funds. Currently the DOE, The NSF, and the Robert A. Welch Foundation provide approximately 80% of our total funding (~ \$4,700,000/year). Thus the 20% provided through State Line Item support is leveraged at 4 to 1. However, over the past 15 years the state contribution to our operation has not increased, resulting in a ~50% decrease in real purchasing power of those funds due to inflation. We at the Institute have attempted to ameliorate the situation by providing irradiation services for industrial users. The funds realized from that effort have proved to be very helpful in providing some needed improvements of the accelerator. However, our operations staff remains small given the complexity of our facility and many key staff members are nearing retirement. The wave of retirements has in fact already started and it is a challenge for us to find, train, reward, and retain high quality replacements. A major part of

this problem is the steady erosion of the purchasing power of our State Line Item operational support. While the University has provided some supplementation of the State Line Item support, we remain \$ 500,000 a year below the appropriate level for operation of this facility. Adjustment of our operations support to a more realistic level is needed.

2. Research Group Leaders

There are presently nine faculty members and two research scientists directing research groups at the Institute. With the Department of Chemistry a joint Chair in Nuclear Science has been created and a search for an appropriate candidate is now underway. Filling this position is of high priority.

3. Graduate Students

The state is best served if its graduate programs produce the highest possible quality of trained professionals. Attracting the best possible students into our graduate programs is very important to this process. We are at a disadvantage in recruiting, as university stipends for graduate assistants have become less competitive as our graduate student assistants must still pay tuition and fees, and that these fees have increased. We at the Institute strongly support the adoption of a policy exempting graduate assistants from tuition and fees.

Department of Mathematics

Summary

The Department of Mathematics has made considerable progress since the last NRC ranking and we must continue to improve our research capabilities. Over the last several years, we have shown our capability to gain large scale research infrastructure grants from the National Science Foundation in face of fierce competition from schools ranked far higher than Texas A&M. Indeed we have gained such an award in each of the last three programs initiated by the Foundation, and more impressively, done so in an early round of the competition. The VIGRE grant is an excellent example. Our target is to be classified as a *first tier* research department, or within the top 25% of Ph.D. granting institutions. By many measures we have achieved this goal, affirmation from the next round of NRC rankings should be the aim.

This is a superb time to invest in a Mathematics department. While federal funding for basic, non-medical research is running on flat budgets, mathematics is scheduled for considerable growth. The centrality of the discipline from both a research and teaching standpoint and the need to ensure that the US retains its undisputed leadership in mathematics has been recognized throughout Washington.

If the university wishes to be one of the national flagship institutions then a quality, vibrant and high impact Mathematics Department is essential. This plan has major impact on *Vision 2020 Imperative* numbers 1, 2, 3, 4 and 6.

College of Science Strategic Plan 2001 - 2005

Faculty: (*imperative 1*) It is essential we increase our research strength in both emerging and traditional areas. The hiring of new faculty is imperative and we operate in an exceedingly competitive market. We expect retirements to continue at a steady 2 per year over the next period, but retention has been a major issue, particularly recently. Over this year and last we have lost 6 relatively junior faculty, two of “star quality” to other institutions. We cannot afford to be a farm club for the competition.

We have been very pro-active in hiring for diversity (*imperative 6*). An activist position has been taken in the recruitment of Hispanic and women faculty. We have three tenured/tenure track Hispanic faculty and have made a new female tenure track hire almost every year. Unfortunately, we have lost the majority of our female hires; partner placement issues are a major factor. Half of our prestigious three-year term VIGRE Assistant Professorships have gone to women.

The department continues to age. In a steady state situation, one would expect the average of a department to remain roughly constant; the retiring faculty is replaced by junior hires to offset the annual increase of the others. However, over the last five we have aged at an average of almost one year each year. Instead, we should be hiring (and retaining) new assistant professors to match our growth which would result in a declining average age.

The proportion of our students who are taught by a non tenure-track faculty member continues to increase. As we take on new programs and initiatives this drains tenured faculty time; funding constraints have forced us to increase the number of lecturer and visitor faculty. All previous plans have promised to seek means of us moving in the opposite direction.

Thus we must expect to have to make between 4 and 5 permanent faculty hires per year just to say even in this category.

Salary compressions and inversions are horrible. Our attempts to retain recent quality hires have resulted in very little increases for many long-term faculty. The lecturer salary range now overlaps that of the tenured faculty. We used to worry about inversion between adjacent ranks, then double such inversions became common. We are now very close to triple inversions where some lecturers are paid more than some full professors. We are forced by market conditions to make offers of tenured appointments at between 15 and 40 percent more than the existing peer group within the department.

Graduate Program: (*imperative 2*) We are in good health here but have reached a plateau. We are now competing with universities at least one quanta above what we did five or ten years ago. The VIGRE grant was critical. However, the current pool of 95 students is considerably less than our teaching needs and this has become a major issue in staffing our recitation sections. Our remarkably successful master’s level program could be easily expanded, but it must compete for resources with our doctoral program. We face competitive or better salaries from very well established programs. The recent initiatives from the College and the University have allowed us to grant short term fee-remission to entering students and this had made an identifiable difference. We simply have to find a way to offer fee remission to all domestic students.

College of Science Strategic Plan 2001 - 2005

We should expand to 120 students as soon as possible. Initially they will be mostly master's level, but the majority of the additional places will be absorbed by the Ph.D. program. This number is the comfortable minimum for our classroom needs.

Undergraduate Majors: (*imperative 3*) After a period of growth numbers have held level at just over 300 majors. We must renew our recruiting efforts and continue the upward trend of recent years. An increase in the number of (dedicated) scholarships available to the department would help considerably.

We have an excellent opportunity to significantly increase the number of graduates certified to teach. It is partly a resource issue, but there remain obstacles to speedy certification due to policies in the College of Education.

It is important to increase the number of shared majors, in particular through joint programs. We have just initiated one with Economics, but there are significant opportunities in several directions. One priority area would be a joint program in mathematical ecology (to include epidemic modeling) and another in bioinformatics.

It is part of our VIGRE challenge to increase the emphasis on undergraduate research opportunities. We also have a large REU grant from NSF and intend to seek an expansion when it is time to renew. As part of this effort we seek to significantly increase the number of our majors who apply to graduate programs in the broadly defined mathematical sciences.

Finally, the Department would enthusiastically endorse a general science honors degree, encompassing a core in mathematics, in the physical sciences and in the life sciences as well as a research component in the upper division. We view this as an outstanding mechanism to take a leadership role in the improved training of high school teachers (*imperative 12*).

Diversity among our undergraduate majors is exemplary (*imperative 6*). Over 60% of our majors are women, an extremely large proportion for the mathematical sciences. We are the largest producer of Hispanic degrees in mathematics in the US (by a large factor). The latter is no accident. David Sanchez has made considerable efforts, particularly in retention, but he retires at the end of this academic year.

Undergraduate Nonmajors: (*imperative 3*) Our goal here is to continue to improve instruction although we expect changes to be incremental; things are going well considering the level of funding. It is critical that we continue our extensive array of *outside the classroom instruction*. This consists of graded homework, extensive help sessions dedicated to each course and *Weeks in Review* that cover the highlights of the previous week in the course. This is instruction, not "teaching to the test." We fund this from internal sources, often with salary savings and by making commitments of funds with no guarantee they will materialize. Inevitably, it is increasingly under pressure as our resources decline. It should be a priority to set this on a firm foundation with dedicated funding.

Space: We made considerable gains six years ago and the plan at that time was for a second increase to take place when space became available. This second expansion has never

materialized and offices are now at a premium. Professorial rank faculty are now having to share offices and due to lack of space we are forced to turn away long term visitors who are paid by their home institution. This hurts the many connections we have forged with other institutions, in particular our foreign contacts and, correspondingly, our impact on *Imperative 6*. As we attempt to increase the ratio of tenured to lecturer rank faculty this will make space priorities more acute. Space for graduate students continues to be a major problem.

Stable budgets: It is imperative that we decrease the amount of funds that come from various supplements. This would allow not only better planning but the hire of better quality instructors.

Instructional materials: (*imperatives 2,3,5,7,12*) We see numerous opportunities for the development of new and innovative instructional materials, mostly technology driven, and we have played a national and local leadership role in this regard. We have developed a new version of our discrete mathematics course for core curriculum students (with external funding) and an online master's degree designed especially for high school and grade school teachers. This latter program is internally funded and offers a range of mathematics courses from core mathematics areas to communications and information technology that has become so ubiquitous, but for which many teachers are simply untrained. We continue to expand our offerings in this direction to include the Business Mathematics sequence. While we are able to attract external funding for these projects, difficulties in getting even very straightforward contracts through the University's set of tortuous channels in a timely manner remains a serious obstacle.

Department of Physics

Introduction

This assessment of recent progress and activity in the Department of Physics and plans for the next 4 to 5 years is organized under the relevant imperatives of Vision 2020. Our department combines a large service course teaching load, degree programs for undergraduate and graduate majors, and a faculty heavily committed to research and scholarship of the highest quality. We are being successful in hiring of outstanding faculty, and this must continue in order to maintain the vitality of the department. The health of our graduate programs is a concern. The problem is not unique to A&M. We are taking steps to reverse this situation. The directions taken by our department in the next few years will be developed in conjunction with the new leadership in the department; we are currently searching for a new department head and hope to have this person in place within one year.

We first discuss our faculty and their research. Our faculty members have had some outstanding successes in recent years and we discuss possible directions for future hires. We then discuss our graduate program and our plans to increase its quality in a very competitive arena. A major need is to identify funds to increase the financial support we offer graduate students. And, we discuss the role we play in undergraduate teaching and ways in which this is changing.

Imperative 1 Elevate Our Faculty and Their Teaching, Research and Scholarship

Faculty and Research

We have a faculty actively engaged in research and scholarship and they are international leaders in their fields. Our faculty continue to receive honors for their research, most recently and most notably the election of one member to the National Academy of Science.

We have recent new hires in experimental atomic physics, theoretical quantum optics, and experimental high-energy physics. A faculty offer has just been accepted by a candidate in experimental condensed matter physics. But we have had losses as well. One faculty member has retired and two others have left to go to other universities.

We are an aging faculty. We need an aggressive effort to hire young faculty and this hiring needs to be continued for several years. Of our four most recent hires, three have been at the Assistant Professor level.

We have an AUF Faculty Initiative Grant in the area of theoretical telecommunications-informatics. A search is in progress to fill the one faculty slot that has been funded so far. The administration and Physics faculty have approved a position in experimental atomic physics/quantum optics, to support the AUF initiative and to take advantage of a special hiring opportunity. Candidate evaluation for this position by a department committee is under way.

A departmental committee has just submitted a long range planning document, and its report has been presented to the Physics faculty. This report recommended that the department allocate one faculty position in experimental atomic physics/quantum optics, to take advantage of what appears to be an opportunity to attract one of the leading young researchers in subfemtosecond laser research. As stated above, this has been done and a review of candidates is in progress. The report identified as a second immediate need the allocation of a faculty position in high-energy theory, to ensure the continued viability of this group after the hiring away of a senior member. The faculty is discussing this recommendation. The report also recommended the institution of a new research thrust in the department, with a commitment of 2 to 4 new faculty positions. The new area was not specified; the committee had discussed several possibilities: biophysics/medical physics, laser physics applied to different fields (biophysics, chemical physics, etc.), astrophysics, observational astronomy, etc. Selection of one of these areas will be dependent on further faculty input and input from the new Department Head.

In 2001, an AUF Research Infrastructure grant was awarded for an interdisciplinary femtosecond laser lab. The leader of this project is a member of our faculty. This facility will be an important addition to our research infrastructure and will promote more involvement of the department in interdisciplinary research.

College of Science Strategic Plan 2001 - 2005

The Board of Regents has just approved the establishment of the Institute for Quantum Studies, with a faculty member of our department as director. The Institute will be a focus of research and of research funding that will be interdisciplinary in nature, encompassing physics, chemistry, and engineering.

Department Administration and Infrastructure

A department head search was instigated in Fall 2000. A search committee has been formed, applications received and reviewed, and currently there is a short list of four candidates. These four will come for interview visits in the first half of June 2001. It was decided by the search committee, with input from the faculty, to conduct a full search that invited both external and internal candidates. The four candidates on the current short list are all external. It is hoped to have a new Head in place by the start of the 2002 academic year, and sooner if possible. The direction and initiatives of the department over the next 4 or 5 years will have to be worked out by the Dean, the new Head and the Physics faculty all working in concert.

The office staff is in the process of being reorganized into business and office administrative career ladders, with a senior staff person as the administrative leader of each of the two groups. Overall oversight is to be done by the Associate Head. We had a retirement last year of a senior staff person and this summer our senior business person will retire. We need to expand the office staff and have submitted a request for a technical secretary position. A request for a facilities coordinator has been granted, and we are currently seeking to fill that position. A primary duty of that person will be to maintain our physical inventory. The possibility of additional technical staff in our shops is being reviewed.

During the past two years our departmental computing infrastructure has been significantly improved. A high-speed network now connects the offices and research labs in both wings of our portion of the Engineering/Physics Building. A new fiscal accounting system, that parallels FAMIS, is in place and is very useful for departmental bookkeeping and administration. Our faculty members participate fully each year in the Faculty Workstation Program. All office staff members have up to date computing equipment and software, and there is a stored file system for all administrative users. Our computer manager resigned this spring, and we have just hired a replacement. We also lost the manager's primary technical assistant. The new system manager will work with the department administration to determine our computing hardware, software, and staffing needs for the future. One clear need is to incorporate our faculty and research staff offices and labs in the Doherty Building into our high-speed departmental network.

Imperative 2 Strengthen Our Graduate Program

Raising the number and quality of our graduate students is a top priority of the Department. The recent decline, in number and quality, of our graduate students is alarming. Of special concern is our difficulty in attracting high quality U.S. students, but even the quality of foreign students we can get to come to our department is declining. Too many entering students have academic problems and leave, and too many transfer to other departments or schools without completing a degree here. We have a large research-active faculty and in recent years our number of Physics

MS and PhD graduates is far below what it should be. The problems we are having are shared by our peer institutions.

To address these problems the department appointed an ad hoc committee. This committee has just recently made several recommendations that have been endorsed by a vote of the physics faculty. The aim of these recommendations is to get students involved in research more quickly and to make our financial support package more competitive with peer institutions. In terms of graduate assistantship stipends and tuition remission, we have fallen far behind our peer group institutions and are therefore having great difficulty competing in the market for top-quality students. Part of our plan is to provide tuition scholarships to all students for the first two years and to expect the research advisors to provide this afterwards. We also see an immediate need to increase our stipends, initially by 15%. The total cost of doing these two things would be approximately \$300,000 a year in additional funds, and the money to do this must be found.

One year ago we received approval for a PhD degree in Applied Physics. We must become much more proactive in setting up the administrative structure for this program and in recruiting more students into it. In principle, it uses existing faculty and courses but allows for more interdisciplinary coursework and research than in the traditional Physics degree.

Once our financial package is made competitive, we must still improve our graduate student recruiting. Our faculty must make more visits to colleges and universities in Texas and neighboring states. Among our U.S. students, women and minorities are underrepresented, and we must find ways to bring them into our programs and to nurture and retain them once they are here. As part of our recruiting effort, we have recently completed an update of our graduate brochure, and we maintain a departmental web site that describes our faculty, facilities, research programs and also gives application information. As an important component of our graduate student recruitment, we need to develop summer research programs for undergraduates.

Imperative 3 Enhance the Undergraduate Academic Experience

Teaching Mission

The Physics Department continues to carry a large undergraduate service course teaching load, primarily for students in engineering and physical sciences and in life sciences. In conjunction with the College of Engineering and other departments in the College of Science we participated in a review of the engineering freshman year. A result of this study was to retain two semesters of physics as a requirement for all engineering students but the sequencing was changed to place both semesters of physics into the freshman year. Physics participates in the “clusters” of engineering, physics and math courses, but only a portion of engineering students enroll in cluster sections. Maintaining a dual set of sections for each course causes scheduling difficulties and inefficiencies and needs to be reassessed.

State requirements for public school teacher certification have been revised this year. The university response to the state changes is still being formulated. Physics has been involved in these discussions and must continue to play a role. A new physics course, Physics Concepts, is

College of Science Strategic Plan 2001 - 2005

being developed and will be part of the elementary certification requirements. Professor Robert Clark has left the university but will continue to lead continuing education programs for teachers at A&M in the summers. Local faculty need to be identified who will take on some of the leadership of the teacher certification activities previously done by Dr. Clark.

The department is attempting to expand its astronomy course program. More sections of PHYS 306 are being taught. Using SLEAF and IE/EF funds a major upgrade and renovation of our teaching observatory is underway. This will increase the capacity of our observational astronomy courses, allow for more advanced courses, and provide for more opportunity for community outreach, for example to K-12 schools in the area. Our astronomy program is currently being led by a research astronomer who is here as a Visiting Assistant Professor. More permanent staffing of our astronomy program must be sought.

The recently approved undergraduate music degree has a physics course (Musical Acoustics) as a required course. The Physics Department must continue to seek new ways of serving the broader academic needs of the University.

Modern instrumentation and use of computers for data acquisition and analysis continue to be incorporated into our teaching labs, both for the introductory and advanced courses. This must continue. Classtalk interactive learning hardware has been installed in one classroom and is being used on a trial basis for PHYS 202 in Fall 2001. A state of the art projection system has been installed in the large classroom/seminar room in the Engineering/Physics Building and similar installations are being planned for rooms in Heldenfels. We must continue to use the best available educational technology in our teaching program.

Undergraduate Physics Degree Programs

Although the quality of our undergraduate majors remains very high, the number of BS and BA degrees we grant in Physics is declining.

Our degree programs must be kept current with changes in physics and the physics job market. During the past three years, the curricula for physics BS and BA degrees have been evaluated and revised with the creation of some new courses. We must look outside the traditional physics education, especially to more interdisciplinary academic programs. A joint physics-engineering committee has been set up to explore creation of an undergraduate engineering physics degree.

A departmental committee has also been established to look at issues of recruitment and retention. We must become more active in high schools, to interest students in physics and to recruit the best students to A&M. Ties with our department and articulation agreements need to be established with two-year and small four-year colleges in Texas, especially those in South Texas that have a large Hispanic enrollment. Financial resources must be devoted to recruitment and retention, in the form of scholarships, faculty travel, and release time for faculty actively involved in recruiting and advising.

Summary

We have a faculty of high quality but must continue to hire the best young physicists in order to maintain our research and teaching vitality. Our department head search must yield a creative, energetic, and able administrator who is also a recognized leader in his field of research. His vision and leadership will help the Department rise higher in national rankings and to continue excellence in performance of all of its missions. We must retain our present capable and experienced office and support staff and add to it where needed. Our graduate program continues to produce some outstanding graduates, but we must take steps to increase both the number and quality of students entering our graduate program and also the number who receive degrees. We continue to meet the service course needs of a large number of departments and must expand our course offerings in innovative ways, for example in astronomy and in teacher preparation. And we need to recruit more high-quality students as undergraduate majors.

Department of Statistics

Introduction

The Department of Statistics went through a major planning exercise in 1997 that culminated in our 1997 Strategic Plan. Based on the results of faculty discussion, the 1997 plan was used as the framework for this document. The department met to discuss the issues involved and was actively involved in the editing of the items listed below. All faculty members were given an opportunity to both comment on the prepared material and provide new items for inclusion.

As of September 1, 2001, the Department will consist of 25 FTE faculty members and approximately 90 graduate students. We have a broad-based graduate program capable of training students in all dimensions of statistical research and awarding either a MS or a PhD in Statistics. The most recent National Research Council (NRC) rankings of statistics programs ranks the department thirteenth among departments of statistics. This recognition is the reflection of the Department's successful growth over the last fifteen years. This growth has allowed our Department to become a leading resource for research in measurement error models, smoothing, time series and interdisciplinary research.

The Twelve Imperatives

Imperative 1: Elevate Our Faculty and Their Teaching, Research and Scholarship

The department recognizes that Texas A&M can attain the goals of *Vision 2020* only if it is able to attract and retain leading faculty members. Over the past five years, the Department has recruited eight new faculty members at the assistant professor level. Seven of these faculty members are still in the department, and one has been promoted to associate professor. Through these appointments we have been able to strengthen our research potential in new areas of

College of Science Strategic Plan 2001 - 2005

statistics, such as wavelets, increasingly important areas of statistics, such as Bayesian methods, and interdisciplinary efforts, such as those with the Faculty of Toxicology. These efforts, which were designed to move our department beyond our 1995 NRC ranking of thirteenth in the country among departments of statistics, have continued to strengthen our department's research accomplishments and recognition. With the chance to recruit two additional faculty with interests in bioinformatics (through the AUF initiative), and the opportunity to replace recent resignations and expected retirements, we believe that we can attract the faculty necessary to move the Department into the top ten.

Our plan is to do this by recruiting in both newly emerging areas and in current areas of strength, to ensure the continued critical mass required to maintain national prominence. This cannot be done solely by recruiting at the assistant professor level. Senior faculty must be identified who can lead the expansion into new areas. Retention of existing strength is also paramount to our successful development and growth. Salaries of leading researchers must keep pace with national trends if we are going to be able to keep the quality faculty that we develop.

The Department is also committed to improving the educational experience of Texas A&M students. We are in the third year of a planned expansion into web-based education. We have taught four different courses using extensive web instruction (STAT 601, 608, 651 and 652). These courses were chosen because they also form the core service courses for other graduate programs throughout the campus. Thus, their existence has allowed other programs to develop their own distance degree plans with the understanding that their statistics requirements are already in place. We have had students in Alaska, as well as closer to home, take these courses with excellent success and plan to continue this development effort.

Short Term Goal (Research): In addition to the continued recruitment of excellent junior faculty, the Department plans to selectively recruit senior faculty members capable to strengthening our core research potential and collaborating with leading researchers within the life sciences.

Long Term Goal (Research): The Department plans to develop our reward structure to create a system capable of supporting the research needs of the faculty without sacrificing our commitment to the teaching and service missions of the Department.

Short Term Goal (Teaching): The Department plans to continue the development of the service courses necessary to feed other distance learning programs and provide opportunities to A&M System students in remote locations.

Long Term Goal (Teaching): The Department plans to begin the development of more mathematically oriented distance learning material with the aim of providing web-based coursework that could be used as part of a MS degree in Statistics.

Imperative 2: Strengthen Our Graduate Programs

The Department has a long history of training students for successful careers in both academics and industry. However, as was pointed out in our external review, training in statistics has changed to the point where we need to modify our current program. The Department's graduate program committee has been meeting over the past 12 months to develop this new curriculum, and we expect it to be adopted over the next few months. The result of this revision will be an

College of Science Strategic Plan 2001 - 2005

increased emphasis on research opportunities and an increased exposure to new, important areas of statistics.

Increased funding for research opportunities is also imperative if we are to increase the number of our graduates who pursue careers in academics. Therefore, we plan to increase the number of students funded through training grants, contracts and research grants to a level that will allow all top students the chance to gain research support. This emphasis will also provide more competitive recruiting packages, which are needed to attract both a larger student population and the top students in the country.

The leading attraction of any Department is the caliber of its faculty. Therefore, as in the first imperative, we will continue to strive to create the most distinguished faculty possible. In addition to the immediate benefits of a strong faculty, this will benefit future recruiting efforts, whether for new students or faculty. Of course, a strong graduate program and student base will also help to attract stronger faculty. Thus, it is important to both the research and teaching missions of the university that we strengthen both populations.

Short Term Goal: The Department will complete the curriculum conversion that was started as a result of the external review process.

Long Term Goal: The Department will continue to find ways to promote research experiences for all graduate students and encourage experiences that allow students to think outside the boundaries of specific courses.

Long Term Goal: The Department plans to work with the university to improve our ability to recruit top graduate students.

Imperative 3: Enhance the Undergraduate Academic Experience

While the Department does not have an undergraduate program, we are committed to enhancing undergraduate education. Since 1997, the number of undergraduate credit hours taught by our Department has risen 19%, from 3,902 semester credit hours to a projected 4,643 semester credit hours for FY2001. Within this base is a sufficient number of excellent students capable of supporting an honors curriculum. In response to this, we successfully instituted the Department's first honors course (STAT 302) in 1999. We plan to increase the number of honors offerings to include STAT 211 and STAT 212, which are taken by the mathematical and engineering communities. We also recognize that such a large student population also requires new methods of support. Thus, we are currently experimenting with web-based office hours, or virtual tutors, to allow students greater flexibility in their search for out-of-class help.

Many disciplines are becoming increasingly quantitative. A structured set of courses, as might be provided in a minor in statistics, would allow quantitatively oriented students the ability to respond to this development. We believe that in competitive job markets it is these extra skills that will allow students to be competitive. This increased quantitative reliance also means that it is time to reconsider the creation of a statistics major. The Department was an originating member of the group that developed the APMS program. However, it may be that this program no longer meets all the needs of employers seeking statistically trained undergraduates. The

College of Science Strategic Plan 2001 - 2005

simultaneous consideration and development of these programs should also create a sufficient population of students to effectively teach the courses required by such a program.

Short Term Goal: The Department will develop additional honors courses for STAT 211 and STAT 212.

Short Term Goal: The Department will continue to develop web-based educational material to enhance the learning process.

Long Term Goal: The Department will continue to plan for the eventual development of a statistics minor and major.

Imperative 4: Build the Letters, Arts, and Sciences Core

While this imperative is obviously aimed beyond the scope of any single department, it is clear that there is a need for departments to cooperate if new programs are to grow and existing programs to flourish. The Department plans to work within its means to continue to make available the courses needed for all students to progress towards a degree. Towards this end, we are considering new technology and teaching patterns that will increase student access, improve communication and more efficiently educate students while not increasing the demands for faculty. However, it is clear that as more and more programs recognize the importance of statistics in their students' education, we will soon reach the limit of our ability to meet the university's needs without additional resources.

As a member of the College of Science, we believe that our continued efforts to enhance our own Department is the most effective way we can help to build the core of the Arts and Sciences.

Short Term Goal: The Department plans to continue its efforts to attract leading faculty members to Texas A&M University.

Long Term Goal: The Department plans to pursue efforts in interdisciplinary research that will allow for impact both within and beyond the statistics community. Through these efforts we will help bring the international recognition needed to promote future growth in the Letters, Arts and Sciences.

Imperative 5: Build on the Tradition of Professional Education

The Department of Statistics has a long tradition of providing strong support for the university's professional programs. At both the undergraduate and the graduate level our extensive service teaching commitment is designed to ensure access to statistical education for all students at Texas A&M University. This commitment remains one of the cornerstones of our Department's mission. In addition, the Department is committed to maintaining its tradition of strong interdisciplinary research. Much of this research involves faculty within the various professional programs on campus.

Short Term Goal: The Department will continue to provide excellent educational support to all professional programs at Texas A&M University.

College of Science Strategic Plan 2001 - 2005

Long Term Goal: The Department will consider new methods (both on campus and web-based) to develop stronger ties to the programs that require our services with the aim of ensuring the continual improvement and assessment of the needs of these programs.

Imperative 6: Diversify & Globalize the A&M Community

The Department has made excellent strides over the past five years to increase the diversity of its faculty. We are committed to continuing this effort. We have also been successful in increasing the number of women among our graduate student population. Our efforts in increasing racial or ethnic diversity have been less successful. While we have graduated more Hispanic PhDs in statistics than any other department in the country over the past five years, that number is still less than five. The Department views our inherent geographic advantage as one that should allow us the opportunity to continue to be natural leaders in the training of a diverse graduate student population. We plan to continue to explore ways to link with our sister institutions in the Texas A&M University System to recruit to the best possible students to our program.

Short Term Goal: The Department will work to diversify its graduate student population through additional recruiting of the state's diverse undergraduate student body.

Long Term Goal: The Department will continue its efforts to expand its success in diversifying its faculty beyond our recent successes in recruiting and promoting successful women faculty members.

Imperative 7: Increase Access to Knowledge Resources

Over the past five years, the Department has aggressively grown its computing network to meet the needs of both teaching and research demands of our faculty and students. This effort has created an integrated Unix/Linux computing system and placed at least one computer in every student office. These systems are fully integrated with the university's network and, thus, linked to the library system and the internet. In addition, the Department has made every attempt to provide the software necessary to make these machines effective educational and research tools.

Over the past five years, we have also been able to offer all students offices within the Department. This office space has had several benefits. First, it has allowed easier communication between faculty and students. It has also improved the integration of new and old students, and reduced the natural cultural barriers created by our diverse student population. The ability to continue this policy is at risk, however, due to the increase space demands that are being felt by the Department. It is possible that over the next five years, students without formal support may not be given office space or, perhaps, given space that is so crowded that it is effectively unusable.

Short Term Goal: The Department will continue to update its existing computing networks to meet the needs of both students and faculty.

Long Term Goal: The Department will make every effort to obtain the space required to continue its growth, which has been based on successfully meeting the needs outlined in *Vision 2020*.

Imperative 8: Enrich Our Campus

The Department is in full support of this initiative. Each success in this area enriches the entire campus. From broadening student horizons to enhancing the cultural activity for faculty (both current and potential), this imperative will benefit all. In an effort to support broader collegial interaction and exchange, the Department holds two, biannual lecture series. The *Hartley Lecture Series* and the *Emanuel and Carol Parzen Prize in Statistical Innovation*. These events are held in alternating years, and the internationally recognized recipients of each award are asked to give a presentation aimed at the wider university audience.

In a concrete sense, a campus is enriched through a series of individual and personal interactions. Mentoring programs, such as the TAMU Mentors or the Women's Faculty Network, are effective examples of ways to make a large university seem smaller and more personal. They also help departments reach beyond their own resources to promote environments that support diversity.

Short Term Goal: The Department will encourage its faculty to serve as mentors to both students and new faculty.

Long Term Goal: The Department will attempt to institutionalize our activities so that they become a part of the culture within the Department.

Imperative 9: Build Community and Metropolitan Connections

Texas A&M University is clearly an important resource for the local community, as well as the state. Through increased civic interaction individuals can, and have, given back to the cities that support the university. In addition, through the transfer of knowledge to the local community we can improve the intellectual and economic vitality of our area. The most effective manner in which the Department can help in this initiative is through providing statistical expertise to local industry. This is consistent with our interdisciplinary roots and will continue to be encouraged.

The Department's effort in the training of AP Teachers in the teaching of statistics has received national recognition. The effort, which pairs tenured faculty with master high school teachers, has produced a program that is a role model for what is prescribed by the American Statistical Association.

Short Term Goal: As with the first imperative, the Department will continue to make available education resources for students not able to meet the traditional time demands of our university.

Long Term Goal: The Department plans to develop increased documentation of the skills and interests of our faculty so that we can be a more effective resource for local economic growth and development.

Imperative 10: Demand Enlightened Governance and Leadership

A department operates effectively only through the mutual support of its faculty. The Department of Statistics has operated under the principle that faculty participation in all important issues is necessary for effective decision making. Over the next five years, we plan to

College of Science Strategic Plan 2001 - 2005

overhaul our graduate curriculum, consider an undergraduate degree program, recruit new faculty, attract graduate students and mentor junior faculty all through a joint effort of the faculty within the Department.

Short Term Goal: The Department plans to continue its policy of faculty participation in departmental operations and decision making.

Long Term Goal: The Department will continue to strive for methods to encourage faculty input while balancing the demands of all the aspects of faculty life.

Imperative 11: Attain Resource Parity with the Best Public Universities

Resource parity is the single largest impediment to achieving the goals outlined in *Vision 2020*. Our Department is teaching more students, has a larger graduate student population, was awarded a major post-doctoral training grant, entered into numerous interdisciplinary research efforts, developed joint appointments with the School of Rural Public Health and taken on editorial responsibilities for leading journals, all without effectively increasing the space required for these efforts. With the additional faculty lines from the recent AUF competition, and any potential new hires generated by increased teaching efforts, our Department will be forced to make decisions about allocating space which will hurt our ability to stay nationally competitive.

The Department's increased teaching efforts are also hampered by lack of access to appropriate teaching space. It has become increasingly important that the Department provide high-tech classrooms capable of both increased student interaction and web-based learning support. To be able to meet the increased teaching demands of the undergraduate student population, we also need access to larger classrooms. With such access we will still soon exceed our teaching capacity, but without it we are already have.

The university's recognition that leading scientific problems are naturally interdisciplinary brings to the fore another issue. Interdisciplinary collaboration requires improved jointly accessible space. Initiative such as the new life sciences building will be extremely important if we are to succeed in these initiatives.

Finally, as with all departments, we have lost faculty and been forced to respond to too many outside offers over the past five years. Salaries for our leading researchers must be on par with national trends if we are to stay competitive. If not, we run the risk of becoming a training ground for better funded institutions.

Short Term Goal: The Department will continue to strive to provide the space required to promote the learning environment required for our students, including both office and instructional space.

Long Term Goal: The Department will continue to search for space to support the increasing needs of the Department's research agenda.

Long Term Goal: The Department will work with the Dean's Office to develop a reward structure capable of retaining leading faculty members.

Imperative 12: Meet Our Commitments to Texas

Most people would agree that the education of the state's population is the most visible service the university can provide to its citizens. Providing the best quality education in the most efficient and timely manner allows this benefit to have maximal value. The Department has always strived to teach as many students as is possible in all its classes. We have also maintained a large summer program to ensure students access to courses outside the normal cycle. We view this effort as our most obvious way of supporting the needs of our students. As the university continues to struggle with increased enrollment and as our community grows, new teaching options will need to be found. To that end, we are beginning to discuss non-standard time patterns and increased web-based teaching formats. We are also beginning to explore ways in which our resources can be used to enhance the educational resources of other institutions within the Texas A&M University System.

The Department was founded on the traditions of a land grant institution. Statistics as a discipline has a strong tradition of collaboration with many departments such as those in the College of Agriculture and Life Sciences, the School of Veterinary Medicine and the College of Science. In the past, the Department has also maintained a consulting agreement with the Texas Agricultural Experiment Station (TAES). However, tight budgetary times in the mid-90's caused TAES to terminate this relationship. The reinvigoration of such a consulting center would allow the Department to help support the applied research that many citizens see as a very tangible benefit of Texas A&M University's strong research presence.

Short Term Goal: The Department will continue to plan for ways to provide improved statistical education to all the citizens of Texas through collaboration with the other institutions of the Texas A&M University System.

Long Term Goal: In recognition of the need for the state to effectively spend its education dollars, our long term goal is to institutionalize the support our Department can provide the A&M System so that we can reach students throughout the state.

Long Term Goal: The Department will consider ways to establish a consulting center capable of supporting the land grant research needs of Texas A&M University.

Summary

The Department of Statistics is ideally suited to address the needs outlined in *Vision 2020*. Over the past five years, we have been pursuing a plan of building on our core strengths to develop the highly regarded faculty needed to promote the Arts and Sciences. We are simultaneously pursuing opportunities for interdisciplinary research and collaboration that will allow us to aggressively pursue the needs of the state and the nation in the areas of the life sciences, informatics and telecommunications. These efforts have already born fruit in the form of a NIH training grant in *Biostatistics, Bioinformatics and the Biological Basis of Nutrition and Cancer*. In addition, we plan to continue to recruit leading faculty members capable of enhancing the university's ability to compete in the bioinformatics arena.

College of Science Strategic Plan 2001 - 2005

We are committed to maximizing the educational potential of our faculty through the innovative use of technology to both better educate the students on campus and to provide increased access to statistical course work to students throughout Texas. Our goal is to allow greater access to students throughout the Texas A&M University System to the uniquely qualified resources within our Department. We believe that this will enhance our Department's ability to recruit a more diversified graduate student population and provide new educational opportunities to our sister institutions throughout the system.