

**ANNUAL ASSESSMENT REPORT
AND
STRATEGIC PLANNING UPDATE
Year: 2003**

Area or Unit Name: PHYSICS
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Section 1. Goals and Accomplishments

- Goal 1:** Access and Diversity: Recruit, retain, and graduate more highly prepared and diverse majors in Physics.
- Recruiting by the dept. Graduate Recruiter and faculty members resulted in 14 new graduate students compared with 3 last year.
 - * Undergraduate enrollment has decreased slightly from 37 to 33 in the last year. This number fluctuates normally in this range. Recruiting efforts, which continue, seem to have little effect.
 - The Physics dept. still has three tenure-track positions occupied by women in spite of the fact that one was recruited to another university with an offer of an endowed chair. We were able to recruit another well-qualified woman.
- Goal 2:** Excellence: To achieve the highest standards of excellence in all facets of teaching, research, creative and scholarly activities, and service.
- *At the request of the College of Education PHYS 1400 has been changed to PHYS 3400 since most of the students are at the junior level and because of the effectiveness of the teacher training.
 - Three current majors hold TTU Presidential scholarships.
 - One member of the dept. was made a Fellow of the American Physical Society. One faculty member was awarded the Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation.
- Goal 3:** Engagement: To build quality community connections internally, locally and regionally.
- Faculty and staff volunteer time to lead student and teacher workshop sessions with "Science Day," "Science: It's a Girl Thing," "Crusader Raiders," "Dean's Scholars," Advanced Placement Physics, and American Association of Physics Teachers Physics workshop.
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 - The Physics dept. hosted the fall meeting of the Texas Section of the American Physical Society. The meeting attracted about 220 participants from Texas, Oklahoma, and New Mexico. The meeting included the regional sections of the American Association of Physics Teachers and the Society of Physics Students
- Goal 4:** Information Technology: To maximize effective use of technology in all facets of the department mission.
- Online homework for the introductory courses has improved student learning. Consequently, a new textbook for the introductory courses has been adopted because it has more advanced online homework and offers interactive teaching technology.
 - For the theoreticians, new state-of-the-art computing facilities combined with advanced visual simulations allow first principles calculations that were impossible five years ago.
- Goal 5:** Partnership: To collaborate in strategic alliances with other academic, government,

community, corporate, and private entities.

- *Four faculty members are engaged in interdisciplinary research and two more have submitted proposals with collaborators in other depts.. or universities.

Goal 6: Human Resources: To enhance the quality of the work experience for all Physics department employees.

- One of our technicians received the TTU Quality Service Award.
- Each year at the Society of Physics Students banquet, awards for students, faculty, and staff are presented and the undergraduate and graduate scholarships are announced.

Goal 7: Tradition and Pride: To project a strong positive image locally, regionally, and nationally for the Physics department.

- *Each year Physics faculty members typically chair 3 major conferences or other high visibility events. This year, two faculty members were chair or co-chair of Gordon Conferences.

Goal 8: Institutional Advancement and Accountability. Strengthen fiscal stability and public accountability for the Physics department.

- The department website makes a lot of information about the department available to the public.
- One prospective donor contacted the dept. and is now negotiating with the Development office.

Section 2. Universal Quantitative Data

<i>Fall Semester</i>	1998	1999	2000	2001	2002	2003
Student Information						
Headcount						
Undergraduate	30	25	22	29	37	33
Masters	26	17	17	17	15	20
Doctoral	11	10	12	16	19	20
Law	0	0	0	0	0	0
Total	67	52	51	62	71	73
Entry Scores						
SAT	1274	1334	1255	1283	1276	1213
GRE-verbal	400	523	439	503	482	510
GRE-math	650	688	709	690	747	703
Semester Credit Hours						
Undergraduate	4814	4985	4574	4818	5532	6053
Masters	244	145	160	172	185	178
Doctoral	65	72	80	117	157	154
Law						
Total	5123	5202	4814	5107	5874	6385
Number of Lecture Classes Taught & Avg Class Size	# Avg.	# Avg.	# Avg.	# Avg.	# Avg.	# Avg.
Lower Division	22 56	23 55	25 47	19 65	21 65	22 62
Upper Division	3 10	2 13	2 9	1 7	5 9	4 20
All Undergraduate	25 50	25 52	27 44	20 62	26 54	26 56
Graduate	10 6	6 7	8 6	6 10	10 7	9 9
All Students	35 38	31 43	35 35	26 50	36 41	35 44
Faculty Information						
FTE						
Professor-Lecturer	22.88	23.18	22.1	21.5	23.6	21.1
Graduate Asst. Teaching	5.67	4.75	6.5	8.52	8.16	10
Total	28.55	27.93	28.6	30.02	31.76	31.1
Headcount						
Professor-Lecturer						
Total	27	29	25	23	25	22
Minority	0	0	0	0	0	0
Tenured/Tenure Track						
Total	17	19	19	19	21	20
Tenured	15	16	16	16	16	15
Teaching Load SCH/FTE for total faculty	179	186	168	170	185	205
Student Faculty Ratio	13:1	13:1	11:1	12:1	13:1	14:1
Faculty Salaries vs Peer (Full-time Faculty - 9 Mo.)						
Professor	69943	74650	77943	81509	79518	81113
Assoc	54799	56554	57793	60444	59843	60018
Asst	38234	45000	46402	37977	50667	50667
Lecturer						
<i>Fiscal Year</i>	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003

Degrees Awarded						
Undergraduate	4	3	5	4	3	3
Masters	8	12	9	6	4	7
Doctoral	6	1	0	0	3	3
Law	0	0	0	0	0	0
Total	18	16	14	10	10	13

Classes Taught by						
Tenured/Tenure Track						
% Lower Div. Classes Taught	34	27	29	33	27	30
% Ugrd Classes Taught	36	31	31	35	29	32

Financial Information

Teaching Salaries	1422159	1420727	1578984	1649422	1673704	1702591
Dept. Op. Expenses	237443	240814	254074	277149	254940	257259
Total	1659603	1661541	1833058	1926572	1928645	1959851
Cost per SCH	126	137	157	173	162	143
Cost per SCH In Const. \$	126	134	149	159	147	127

External Funding

Sponsored Projects						
Value by Home Department			2182473	2832061	1832858	2613417
Value by Submitting Unit	1752469	1455872	1978174	2302349	1567537	1881705
Fundraising*	149176	183595	113340	228902	200044	177440

*As provided by Development

PHYSICS

Area/Unit Specific Information

Section 3a. Quantitative Information

Calendar Year	1998	1999	2000	2001	2002	2003
Faculty						
Research						
Journal Articles/Book Chapters	97	74	54	87	80	65
Books	1	2	1	1	1	0
Faculty Reporting Publications (%)	90	95	90	95	95	75
Presentations	20	20	30	43	95	78
External Grants Submitted	26	41	30	50	69	62
External Grants Awarded	20	34	21	46	49	48
Recognition						
External Awards	2	4	3	4	3	2
Internal Awards	1	6	6	5	1	1
Program						
Recognition						
External Awards						
Internal Awards						
Student						
Recognition						
External Awards						4
Internal Awards						3
Fiscal Year						
Program						
Sections of General Education	149	138	144	128	194	163
Seats in General Education	5855	5116	5214	4663	4977	5940
Students						
Scholarships Awarded(Number)	25	36	22	44	50	37
Scholarships Awarded (\$)	40,400	44,050	26,300	61,033	55,000	23,860

There is No Area Specific Data in Fall Section.

Fiscal Year	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Faculty						
Research						
Start-up Allocated (\$)	0	65,000	200,000	0	282,000	0
\$ Returned Against Start-up	0	166,000	342,000	60,000	112,000	0
F&A \$ Returned	28,382	28,382	20,446	21,414	16,580	11,941

Section 3b. Qualitative Information.

- Efforts to increase diversity: The physics dept. faculty give recruiting talks at any high school or college where an invitation can be obtained. All ethnic groups and minorities are included.
- Recruiting efforts: Faculty members travel to high schools and colleges and give talks. The undergraduate and graduate programs are advertised on the dept. webpage. Public school students are invited to performances of the "Physics Circus". Graduate students are recruited through personal contacts with faculty members at other universities. Faculty telephone prospective students. Students identified as interested in physics are sent letters describing our program.
- Retention efforts: Undergraduate students have easy access to faculty members. Students with academic problems are advised by faculty members, in particular, the undergraduate advisors, as to possible remedies. Almost all faculty members are involved with undergraduate majors in research labs or special projects. The faculty supports the student organization, the Society of Physics Students. Graduate students are mentored by their research director.
- New and renewed accreditations and certifications: The Physics dept. is reviewed as a support dept. whenever the College of Engineering is reviewed by the Accreditation Board for Engineering and Technology. In addition, the Physics dept. is reviewed by ABET at the same time as part of the Engineering Physics program which grants the B.S. degree in the College of Engineering. The last ABET review (favorable) was in 1999 and the Engineering Physics program will be reviewed again in 2005.
- Participation in EC-12 schools and programs: A graduate student taught two Upward Bound classes for high school students. Kids in Physics is provided monthly to 100-150 Pre-K, K, 1, 2, and 3 grade students at the Physics building by faculty and public school teachers (20+ over the last 5 years). We provide hands-on science instruction over a three-hour period.
- Participation in "Girls in Science" and similar programs: Faculty and staff volunteer time to lead student and teacher workshop sessions with "Science Day," "Science: It's a Girl Thing," "Crusader Raiders," "Dean's Scholars," Advanced Placement Physics, and American Association of Physics Teachers Physics workshop.
- Novel or noteworthy outreach activities: The Physics Circus is performed by faculty before public school groups of 20-200 as an outreach and recruitment tool. We perform at least 20 each year. Kids in Physics is provided monthly to 100-150 Pre-K, K, 1, 2, and 3 grade students at the Physics building by faculty and public school teachers (20+ over the last 5 years). We provide hands-on science instruction over a three-hour period. <http://www.physics.ttu.edu/outreach.html>.
- New or novel uses of technology in instruction: The introductory courses use online homework. Students download their personalized assignments, solve the problems, and upload their answers. The server tells them right or wrong immediately. By use of a standardized test we have found that the student learning is improved by this instant feedback. The curriculum committee has changed the textbook for fall 2004 in order to use updated online homework and other materials provided by the publisher.
- New or novel uses of technology in research: State-of-the-art computer facilities and novel software developments are being extensively used to perform first-principles calculations that would have been impossible only five years ago. This includes advanced visual simulations. The largest calculations involve the use of up to 32 Athlon processors simultaneously for 7-10 days of CPU time. The visualization is essential as the outputs of such runs are too large to be printed and analyzed.
- Mentoring programs and initiatives to enhance faculty and staff retention: New faculty members are mentored by their research group. A teaching effectiveness committee reviews the classroom performance of new faculty members and provides advice if needed. New faculty members not in research groups receive advice, encouragement, and help from faculty members who do research in related fields. New faculty have lower teaching loads and no committee work during their first two years.
- Contributions to university/college/department tradition and pride: The Society of Physics Students (SPS) takes an air cannon to the football games and shoots tee shirts into the stands. The tee shirts advertise physics. The SPS also hosts an awards banquet each year at which awards are presented to students, faculty, and staff. Scholarships for graduate and undergraduate students are presented at this banquet.
- Efforts to decrease deficits and increase revenues in teaching, research, and other revenue-generating activities: Because of the small number of majors, most upper level Physics courses are taught every other year to avoid having small classes. As many sections of the introductory classes as possible are taught in the 200-seat auditorium.
- Activities to identify and interact with donor base: The department publishes a newsletter every other year and sends it to all alumni. The newsletter includes a request for donations. Occasionally, a donor is identified by the development office and pursued by that office and the

dept. when appropriate. One donor appeared this year and is negotiating with the Development office.

- Student Outcomes are assessed by : 1. Which Graduate Schools accept our B.S. graduates. 2. Which industries hire our Ph.D., M.S., and B.S. graduates. 3. Responses to the University 3 and 7 year surveys. Exit interviews for B.S., M.S., and Ph.D. graduates have been instituted. Record keeping to document the above data has been instituted.

Section 4. Strategic Planning Update.

There is no strategic plan update for the current year.

Commentary:

* Undergraduate enrollment has not increased. Graduate enrollment increased to 14 new students in '03. * Additional computers have been obtained for the teaching laboratories, but more are needed. * All teaching labs now have 10/100 base-T connections. * Economic conditions prevent expansion of the MSI program and the industry-based Ph.D. * The QuarkNet program has continued and become even more successful. * A potential donor was identified and is now negotiating with the development office.

Implementation Plan:

Objective 1.2: Undergraduate recruiting must be strengthened, perhaps with a new brochure. Objective 2.2: The MSI program will be kept alive with the few internships still available and by lobbying the industries until an economic upturn produces more jobs. The dept. will approach the Dean about better conditions for the TAs. Objective 8.1: Attempts will continue to identify scholarship donors.