



TEXAS TECH UNIVERSITY
Graduate School™

Graduate Program Review

2000-2006

Department of
Biological Sciences
John Zak, Chair

College of Arts and Sciences
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February 2007

PROGRAM REVIEW OUTLINE

Biological Sciences

- I. **Program Overview** – A one to two-page summary of department's vision and goals.
- II. **Graduate Curricula and Degree Programs**
 - A. Scope of programs within the department
 - B. Number and types of degrees awarded
 - Degrees Awarded – Academic Year (chart)
 - Total Degrees Awarded – Academic Year (chart)
 - Comparison of Degrees Awarded – Fall Data (Peer info table)
 - Program Degrees Awarded (table)
 - C. Undergraduate and Graduate semester credit hours
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 - SCH compared to Budget - Academic Year (chart)
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 - Total Enrollment by Year – Fall Data (chart)
 - Comparison of Enrollment – Fall Data (Peer info table)
 - Program Enrollment (table)
 - E. Course enrollments over the past six years (enrollment trends by course)
 - Course Enrollments by Academic Year (table)
 - F. Courses cross-listed (table)
- III. **Faculty**
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 - Teaching Resources (chart)
 - Tenured and Tenure-Track by Rank - Fall Data (chart)
 - Comparison of Full-time Faculty (Peer info table)
 - B. List of faculty members (graduate and non-graduate) (table)
 - C. Summary of the number of refereed publications and creative activities (table)
 - D. Responsibilities and leadership in professional societies
 - Professional Leadership (table)
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 - E. Assess average faculty productivity for Fall semesters only (use discipline appropriate criteria to determine)
 - Faculty Workload (table)
 - College SCH/FTE – Fall Data (chart)
 - Department SCH/FTE – Fall Data (chart)
- IV. **Graduate Students**
 - A. Demographics of applicants and enrolled students
 - Graduate Student Summary by Category – AY (chart)
 - Graduate Student Summary by Year – AY (chart)
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- Admitted Graduate Students - Fall Data (table)
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- B. Test scores (GRE, GMAT or TOEFL) of enrolled students
 - Average GRE Scores for Enrolled Graduate Students – Fall Data (chart)
- C. GPA of new students
 - New Graduate Students GPA by Level – Fall Data (chart)
- D. Initial position and place of employment of graduates over the past 6 years (table)
- E. Type of financial support available for graduate students.
- F. Number of students who have received national and university fellowships, scholarships and other awards
 - fellowships awarded (table)
- G. Graduate Student Publications and Creative Activities (table)
- H. Programs for mentoring and professional preparation of graduate students.
- I. Department efforts to retain students and graduation rates

V. Department

- A. Department operating expenses
 - Department Operating Cost - Academic Year (chart)
 - Department Operating Cost as a Fraction of Employees - (table)
- B. Summary of Number of Proposals Written and Accepted
 - Summary of Number of Proposals Written and Accepted (table)
- C. External Research expenditures
 - Summary of Faculty Awards (table)
 - Research Expenditures (chart)
 - Peer Institution Info (if available) (table)
- D. Internal funding
 - Source of Internal Funds (TTU) - (table)
- E. Scholarships and endowments
- F. Departmental resources for research and teaching (i.e. classroom space, lab facilities) - (table)
- G. HEAF expenditures (table)

VI. Conclusions – a one- to two-page summary of the observed deficiencies and needs identified by your review. Highlight areas of greatest need and areas of significant contributions.

VII. Appendices – should include, but not be limited to, the following:

Table of Contents

- A. Strategic plan
 - Attachment from Strategic Planning website
- B. Course Offerings (table)
- C. Recruiting Materials
- D. Graduate Student Handbook
- E. Graduate Student Association(s) - Description and information
- F. Graduate Faculty Information Department attaches current copies of entire Confirmation/Reappointment forms submitted for Graduate Faculty Reviews for every faculty member (even tenure-track and non-tenured).

I. Program Overview –

From a platform of innovative approaches that integrate undergraduate and graduate education with collaborative research efforts, the Department of Biological Sciences strives to achieve national and international leadership in research, scholarship, and education in Biological Sciences and to provide leadership in the teaching of life sciences at Texas Tech University. Through our faculty's collective efforts the Department of Biological Sciences strives to provide graduate students opportunities to explore their research interests in molecular, cellular, organismal, and evolutionary Biology, and at scales that range from the gene to the landscape. In the broad sense our research and graduate education efforts are currently focused in six thematic areas within the Department: Animal Physiology and Biomedical Science, Ecology, Evolutionary Biology, Microbiology, Plant Physiology and Biotechnology, and Quantitative Biology. One of the major strengths of our department in graduate education and research is that, in addition to our specific areas of expertise, we can provide broad and in-depth training in Organismal Biology that is unique to many Biology Departments. We have the capability to train students in the identification and taxonomy of organisms as diverse as bacteria and fungi, birds, mammals and tropical plants. We will continue to build on this strength in our graduate program.

Our current thematic areas help foster research and educational collaborations within the Department, with colleagues across the university and in the Heath Sciences Center and with national and international researchers. Utilizing contacts and research collaborations that have been developed by faculty, our graduate students have the capability of working in numerous labs on campus, in labs of colleagues across the country and at field locations as distant as Southeast Asia. These research opportunities help us recruit graduate students from many regions of the country and contribute to a growing number of international students applying for entry into our graduate program based on this exposure and foreign contacts.

Our M.S. degrees in Biology, Biological Informatics, Microbiology, and Zoology are designed to provide an in-depth exposure to biology; opportunities for individual research exploration in a student's discipline; train and mentor students in research and teaching methods, manuscript preparation and oral communication skills; and foster and develop the development of research skills necessary for employment or for progressing to a Ph.D. or other advanced degree. For our Ph.D. degrees in Biology and Zoology, our program efforts are designed to provide in-depth exposure to Biology, foster and support individual research exploration in a student's discipline; train and mentor students in research methods, manuscript preparation and oral communication skills; promote the development of effective teaching skills; and mentor our students for success as faculty and researchers.

To assist us with our Graduate Program Efforts and to increase academic diversity in the Department we initiated a Teaching Post-Doctoral Fellows Program in 2003. While the goal of the program is to help train new Ph.D.s in teaching pedagogy while assisting in teaching and initiating research collaborations, many of our Teaching Post-Docs. directly interact with our graduate students in teaching and research endeavors. These interactions provide unique mentoring opportunities to our graduate students and allow them to know and learn from peers who were recently graduate students working towards the completion of their Ph.D.

Assessment of our efforts to improve graduate education in our Department is focused on: 1) ensuring the ability of our graduate students to successfully compete for faculty, government, or industry appointments, 2) increasing the number of publications from our

graduate students before graduation, 3) increasing the numbers of awards and honors received by our students for presentations at national or international meetings, and 4) increase the numbers of scholarships and fellowships received by our students from the university, scientific societies, or philanthropic organizations that support graduate education. Over the past six years we have been very successful at placing our Ph.D. in academic positions, in government labs and in industry. To help prepare our graduate students for their future careers we encourage our graduate students to be active in scientific societies. The Department has increased travel support for graduate students to regional, national or international meetings to present talks or posters on their research. Within the Department a Graduate Student Forum has been an on-going event in the Spring Semester to allow students the opportunity to present talks on their research and to receive feedback before giving their talks at scientific societies.

II. Graduate Curricula and Degree Programs

A. Scope of programs within the department

Degree Programs

The Department of Biological Sciences has six programs of study leading to the following graduate degrees:

1. Master of Science in Biology
2. Master of Science in Biological Informatics
3. Master of Science in Microbiology
4. Master of Science in Zoology
5. Doctor of Philosophy in Biology
6. Doctor of Philosophy in Zoology.

All Masters' students may elect a non-thesis option. In addition, the Department participates in the interdisciplinary program leading to the degree of Master of Science in Biotechnology. Currently there are 112 graduate students (63 Ph.D. and 49 M.S.) enrolled in our degree programs. For all of the doctoral and Master's programs, each graduate student develops an individual plan of study in consultation with his or her Advisory Committee that is designed to make the student aware of the current state of knowledge in his or her area of specialization, advance the student's specific career goals, and assist the student to successfully complete his or her research. All new graduate students must enroll in BIOL 6202 Preparation for Graduate Learning and Teaching in Biology during their first fall semester in the program, and all new teaching assistants must also enroll in one section of BIOL 6301 Advanced Topics in Biology for additional training and development of their teaching skills. These are the sole graduate course requirements at the departmental level. The Department currently offers over 50 courses at the graduate level encompassing all major areas of the biological sciences. Graduate students may also take graduate courses offered by other academic departments, and they may choose to designate a minor in a related area outside of the Department.

Admission into the Graduate Programs

Student recruitment into our graduate program occurs either through direct recruiting by faculty at meetings, through contacts with colleagues at other institutions, through contacts initiated by student after visiting our website, or by faculty examining unsolicited applications in the Graduate Secretary's office. To apply to our graduate program, prospective students complete the departmental application form, which may be filled out and submitted on-line, have three reference forms with accompanying letters of recommendation sent to our graduate secretary by the referees (not by the student), and complete a goals statement. The application and reference forms are both posted on the departmental web site at <<http://www.biol.ttu.edu/grad.asp>>. Once an application has been received, the Department's graduate secretary notifies all faculty by electronic mail of the prospective graduate student's GPA, test scores, area(s) of scientific interest, and other pertinent information. Each faculty member then has the opportunity to review the application and determine whether he or she wishes to serve as the student's Major Advisor. At least one Graduate Faculty member must make a commitment to serve as Major Advisor before a prospective student can be admitted. This requirement is effective in creating a personalized link so that new students are able to orient themselves in the program and begin their research promptly. The Graduate Student Selection Committee, typically composed of six faculty members from within the Department, makes the final decision regarding a student's admission into the graduate program.

Applications are evaluated in a holistic manner, including evaluation of the applicant's GPA, standardized test scores, transcripts, goals statement, letters of recommendation, and any other evidence of previous scientific achievement or merit (for example, publications resulting from undergraduate research). After a student has been admitted, a decision is made regarding the award of a teaching assistantship if the student has requested to be considered for one.

Progress Towards the Graduate Degree

Once a student is admitted into our program their progress is monitored by our Graduate Advisor and by their Advisory Committee. All students are requested to establish their Advisory Committee within the first semester. For a M.S. degree, three committee members are required while for a Ph.D. degree, the department requires five members appointed to a student's advisory committee. While the majority of the members of an advisory committee must be from Biological Sciences, students are encouraged to take advantage of expertise available across the university and most do.

Generally, Master's students are expected to complete their degree requirements in two years and doctoral students in five years. Students conducting field based research usually take longer to complete due to the nature of their research. The Department offers virtually all of its graduate courses on a semester, annual, or biennial schedule so that students may take their desired courses without delaying graduation. All students are expected to complete their courses as soon as possible. Advisory Committees will usually approve a course substitution on the degree plan if the original course is not being offered in a timely fashion. Each graduate student is required to complete and submit an annual graduate student evaluation form (due in January for the previous calendar year). These forms allow the Graduate Advisor to track the progress of each student through the degree program. Students who are behind schedule to form their Advisory Committees, file their degree plans at the Graduate School, present research proposals to their Advisory Committees, and/or hold annual meetings with their Advisory Committees are reminded of their responsibility to fulfill these departmental and Graduate School requirements.

Philosophy of Graduate Education

The Department is committed to seeing that all of its graduate students are successful in the completion of their degrees. To achieve this end, each graduate student is required to hold at least one meeting annually with his or her Advisory Committee. The purpose of this meeting is for the student to present recent research results, discuss alternative experimental approaches, resolve potential problems, and foster open communication between student and committee members so as to avoid unpleasant setbacks later in the student's program. In addition to the development of a student's research expertise, the faculty also seek to instill in the student a love of learning, a mastery of scientific ways of thinking, a desire to contribute to the advancement of scientific knowledge, and improvement of both oral and written communication skills. Only a small number of students (typically less than five percent) fail to complete their degrees, usually for personal reasons. All graduate students completing a thesis or dissertation are strongly encouraged to publish their work in peer-reviewed scientific journals in their field. The Department also encourages student participation at regional and national meetings and actively supports graduate student requests for travel to meetings to present their research as part of their graduate education. Support for graduate student travel is provided through our Graduate Tuition account, our two graduate student organizations, (TTUAB – Texas Tech University Associate of Biologists, and ASM – the student chapter of the American Association of Microbiologists).

The Department remains committed to finding new opportunities to support our graduate students and maintain an active recruitment effort by our faculty. Over the last six years we have successfully recruited eight new faculty who continue to build upon the on-going graduate and research efforts of our department. We will continue to try and recruit faculty who will become a vital and energetic component of our graduate efforts. Our goal is to build upon the current strengths of our department while having the vision to move into new venues of research. The placement of eight of our faculty into the Experimental Sciences Building has provided us with opportunities to develop new programs and to expand upon our current strengths that will likely lead to increased graduate enrollments.

Research and Teaching Opportunities

The Department offers opportunities for both basic and applied graduate research in all major fields of the biological sciences, including systematics and evolutionary biology, ecology and environmental biology, cell and molecular biology, quantitative biology, and several areas of animal and plant biotechnology. Graduate students who have pursued Master's and/or Doctoral degrees have received competitive grants; made presentations at regional, national, and international scientific meetings; and published in highly regarded, peer-reviewed scientific journals. Many have gone on after graduation to have successful careers in medicine, teaching and research, government, and industry. Within Biological Sciences a graduate student can focus their research interests to specific areas of research expertise which includes behavioral ecology, population biology, cancer biology, community and landscape ecology, conservation biology, developmental genetics, endocrinology, entomology, evolutionary biology, mammalian systematics, marine ecology and fisheries biology, microbial ecology, microbe-host interactions, microbial genetics, molecular immunology, molecular systematics and evolution, molecular virology, parasitology, plant molecular and cell biology, plant molecular genetics, plant physiology, quantitative biology, science education, and threat reduction/nonproliferation of biological weapons. In addition, numerous joint research projects involving graduate students are being carried out in collaboration with other faculty across campus, including those located in the College of Agricultural Sciences and Natural Resources, College of Arts and Sciences, College of Engineering, the Museum of Texas Tech University, and the Texas Tech University Health Sciences Center. Other projects are being conducted with off-campus researchers in other regions of the United States and around the world, including such far-flung locations as Australia, Malaysia, Ecuador, and Ukraine. All of these interactions at the local, regional, national, and international levels provide opportunities for graduate students to enrich their research experience.

The number of Graduate Faculty in the Department as of September 2006 was 35, a modest increase from 30 six years ago. Several of our faculty (Burns and Heintz) over the last six years have had extensive administrative obligations which has precluded their extensive involvement in graduate education. For the 2006 academic year the average number of graduate students mentored by each faculty member was 3.1. In the 2000 academic year, for which we also had thirty-five graduate faculty there were on average 2.3 graduate students mentored by each faculty member. Over the last six years we have also seen a loss of seven senior faculty through retirement or resignations and one junior faculty member resignation. This loss in senior faculty has contributed to some of the decline in our research funding over the last six years. Importantly our graduate program has continued to grow as we hired new faculty and the remaining faculty have increased their graduate recruitment.

Financial support for graduate education comes primarily from teaching assistantships offered by the Department and research assistantships offered by individual faculty, depending

on the availability of research grant funding. Currently, there are 78 TAs and 22 RAs among our graduate students. The number of TAs needed in the department has increased over the last six years from 54 in fall 2000 to the current number. This increase in TAs is in response to the twenty-four percentage increase in biology majors during this period and a forty-four percentage increase in total undergraduate enrollment. The increase in TAs support was provided by the Dean of Arts and Sciences and the Provost in response to these increases in undergraduate enrollment, which impacts directly our graduate program. The department does not have the funds to provide RAs during the long semesters. RAs during the long semesters are provided by faculty through their funded research or from start-up for new faculty to recruit graduate students. In addition, the Texas Tech University/Howard Hughes Medical Institute Science Education Program, in conjunction with the Department, supports three TTU/HHMI Graduate Teaching Scholars. These students, selected from a broad pool of applicants interested in future teaching careers, are evaluated by master teachers in the Department and also work with the University's Teaching Learning and Technology Center to enhance their teaching effectiveness. The number of RAs in the department varies across years depending upon funding success. Graduate students have also been supported by scholarships and fellowships from various governmental agencies such as the EPA, through the Fulbright organization or from their home country. The number of students supported in this manner varies each year. Our graduate students are encouraged to apply for fellowships and dissertation improvement grants when possible. The department works to ensure that all students have support during the summer and uses some of the Graduate Tuition funds to provide departmental RAs for one summer session. During the summer graduate students are also supported as TAs for our summer classes. We have been supporting up to twenty-four graduate students as TAs during the summer. The majority of our graduate students are supported through faculty RAs during the summer.

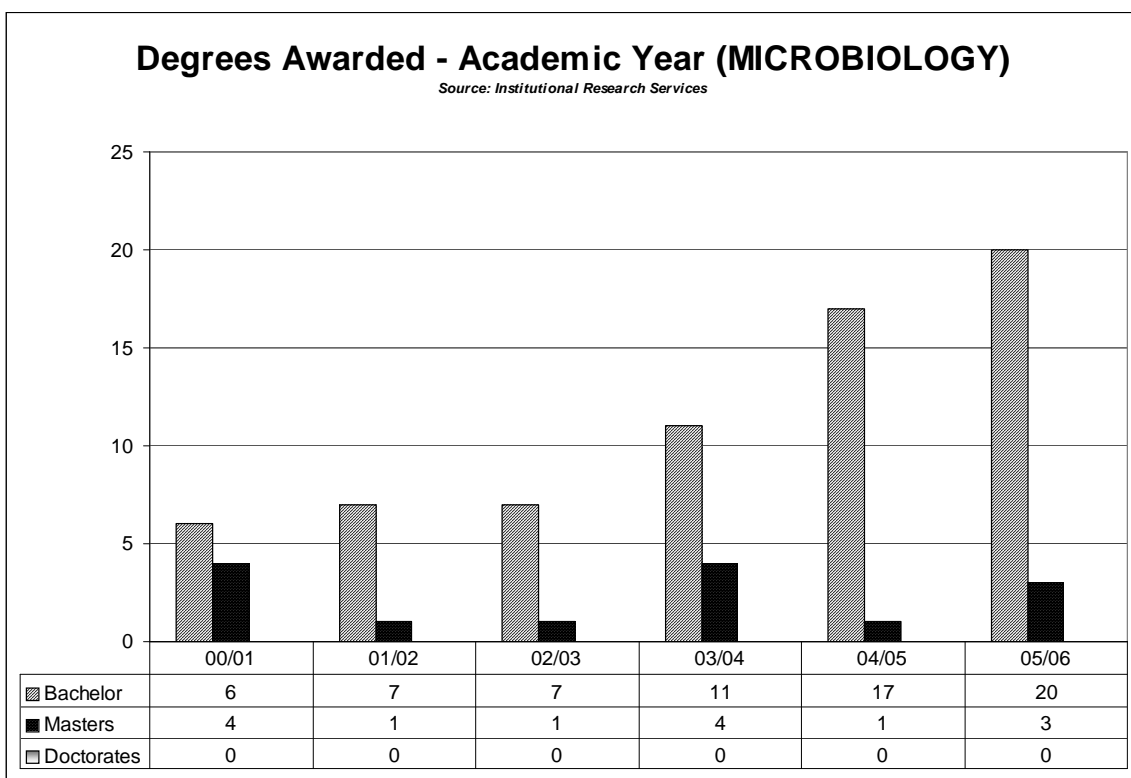
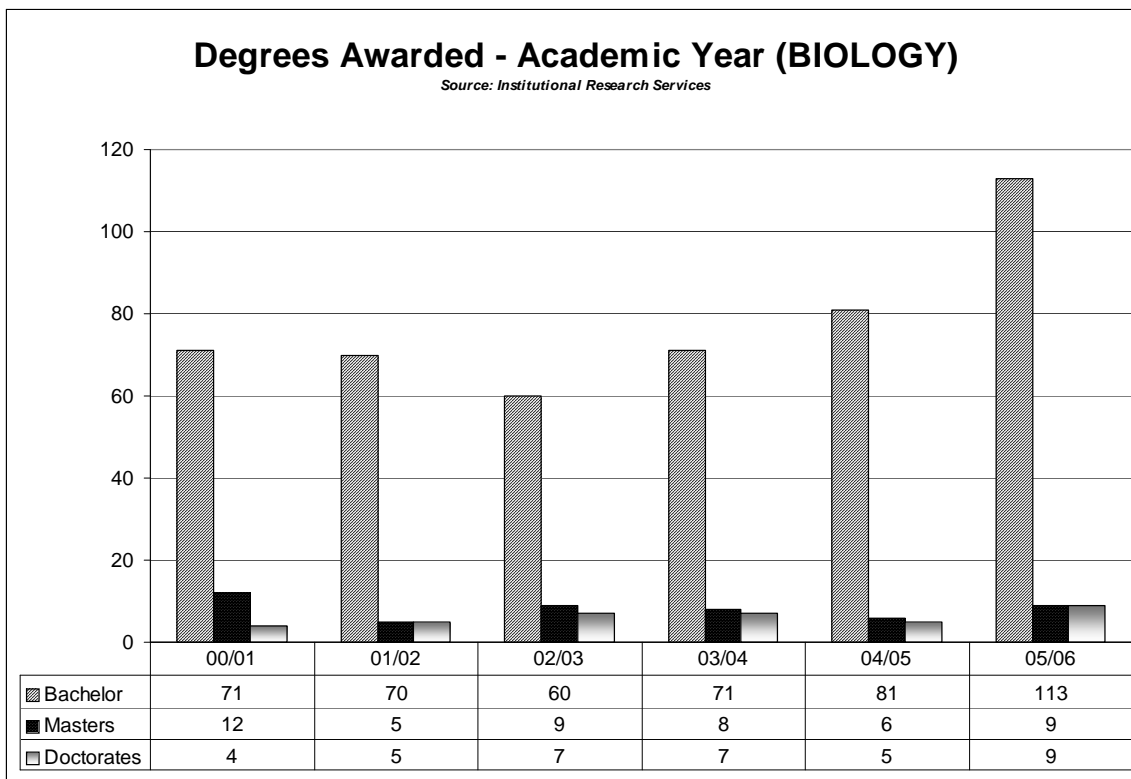
Over the last six years, four of our graduate students have participated in the TEACH Program supported by the TLTC and the Teaching Academy. Moreover, the Department of Biological Sciences was recognized in April 2006 for our overall commitment and dedication to undergraduate and graduate education with the Department Excellence in Teaching Award. Funds from this award are being used to develop several rooms in our building that are conducive for discussions between graduate students and their mentors, for small class discussions and to provide graduate students the means to meet with their peers and advisors to work on manuscripts and proposals.

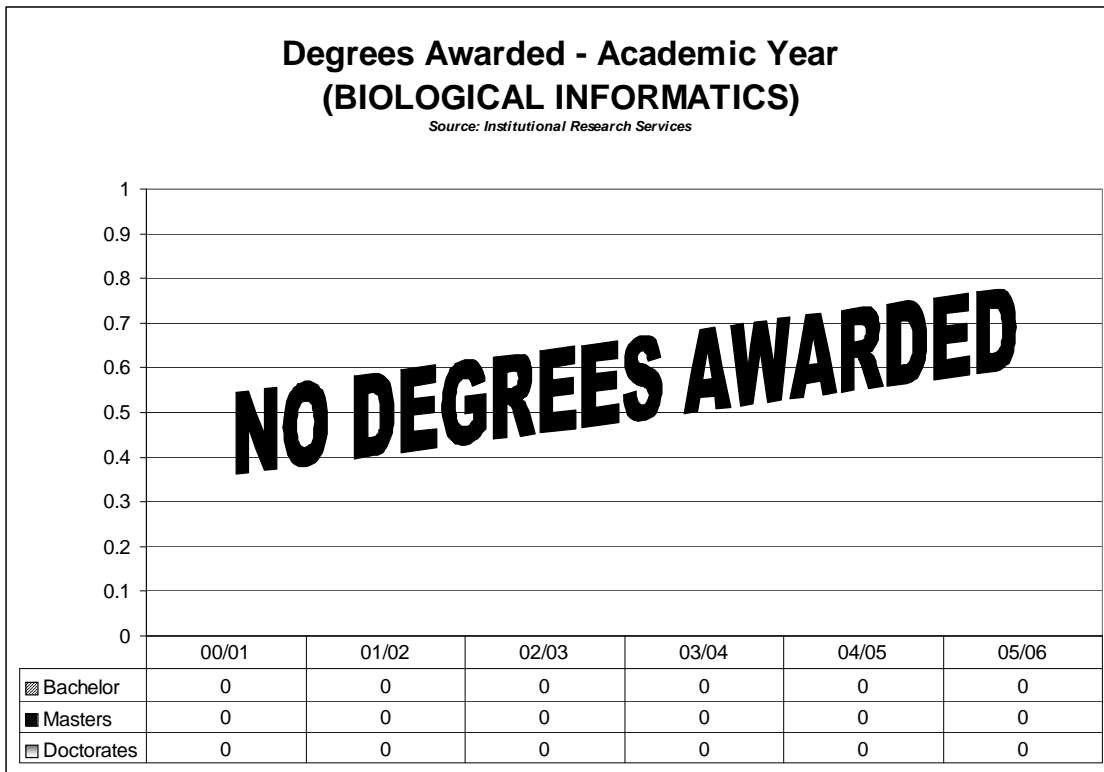
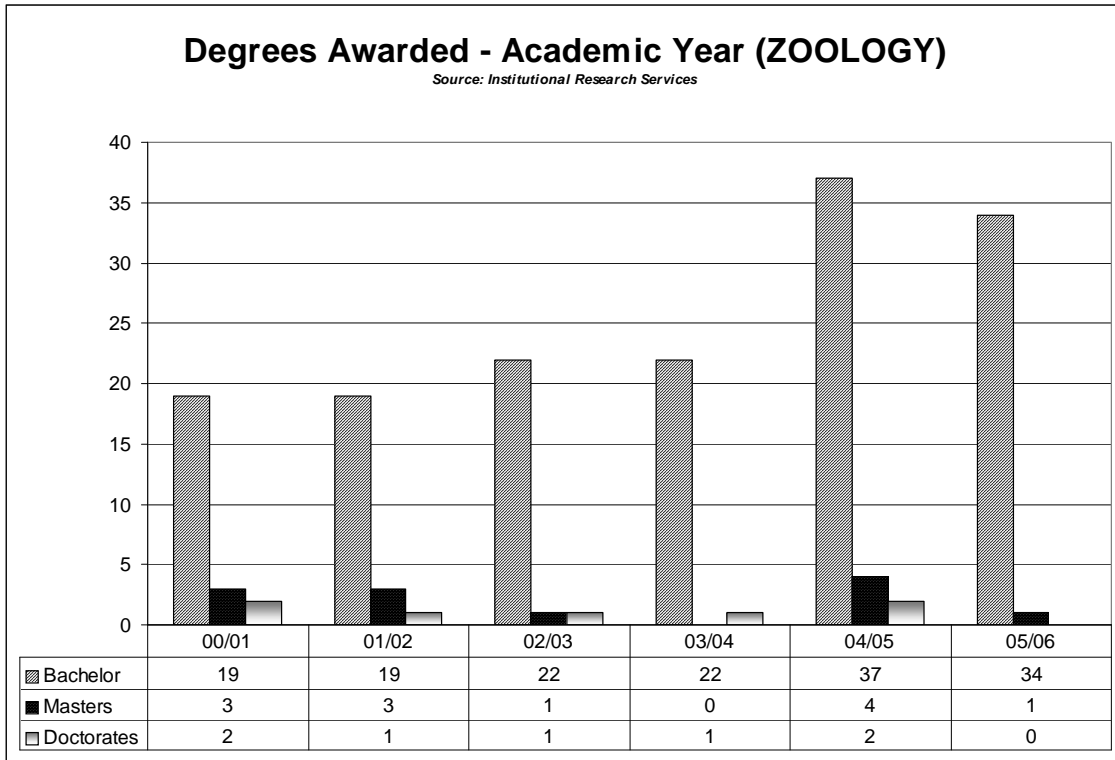
All graduate faculty in Biological Sciences are actively involved in educational opportunities and training. To provide expanded opportunities to our graduate students we have been increasing the numbers of adjunct faculty who have graduate faculty status participating in our Department. For 2006, we have five adjunct faculty from the USDA-ARS Plant Stress Lab and the Texas A&M Extension Service associated with our graduate efforts.

In addition to mentoring by the major professor and members of their advisory committee, graduate students are assisted in their programs by: 1) the Graduate Advisor and Program Coordinator, which is a tenured faculty member, 2) a graduate secretary (permanent staff member) who maintains all records and notifies students of all issues involving the Graduate School, 3) an office staff member who assists all graduate students in enrollment issues, 4) one of our Associate Chairpersons who coordinates all TA assignments and works with the graduate students and Chair to ensure financial support, 4) the Department Chair, who works to provide financial support for all graduate students as needed, and 5) the Graduate Affairs Committee, who works to help resolve issues that arise during a students program in Biological Sciences. One of our Graduate Faculty members, Dr. Lauren Gollahon was made a

National Academies Teaching Fellow and Mentor in 2004. Dr. Gollahon subsequently offered a mentoring course that was developed by the National Academies and the Howard Hughes Medical Institute to graduate students and faculty in Biological Sciences. This course will be periodically offered to our graduate students to help them develop the necessary mentoring skills for their classes and to help prepare them for their careers as academics.

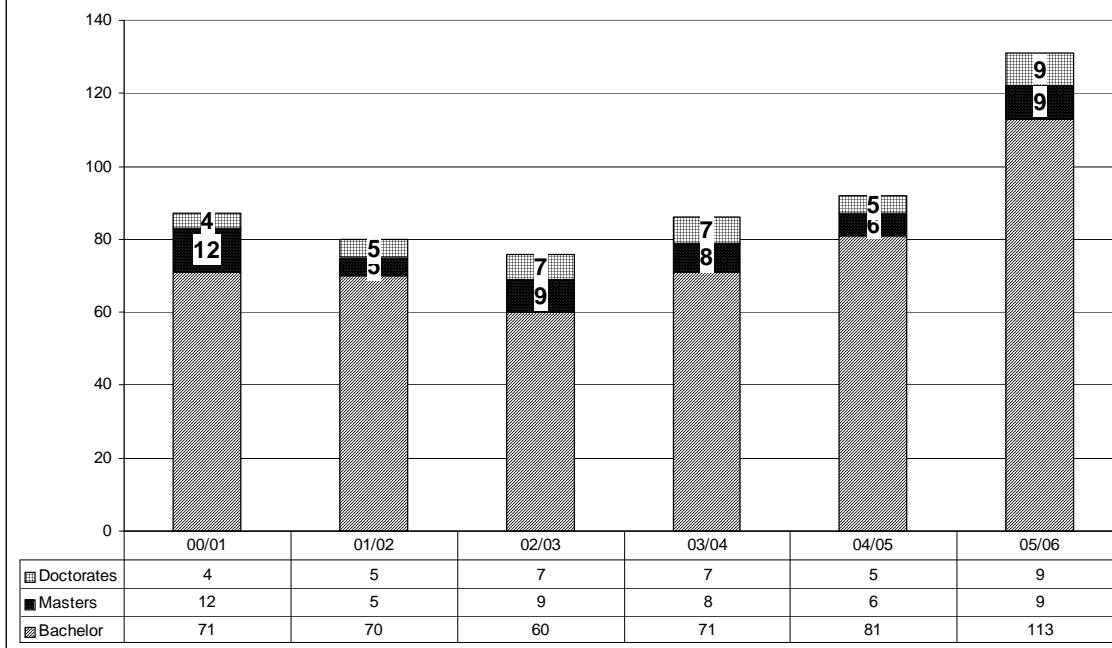
B. Number and types of degrees awarded





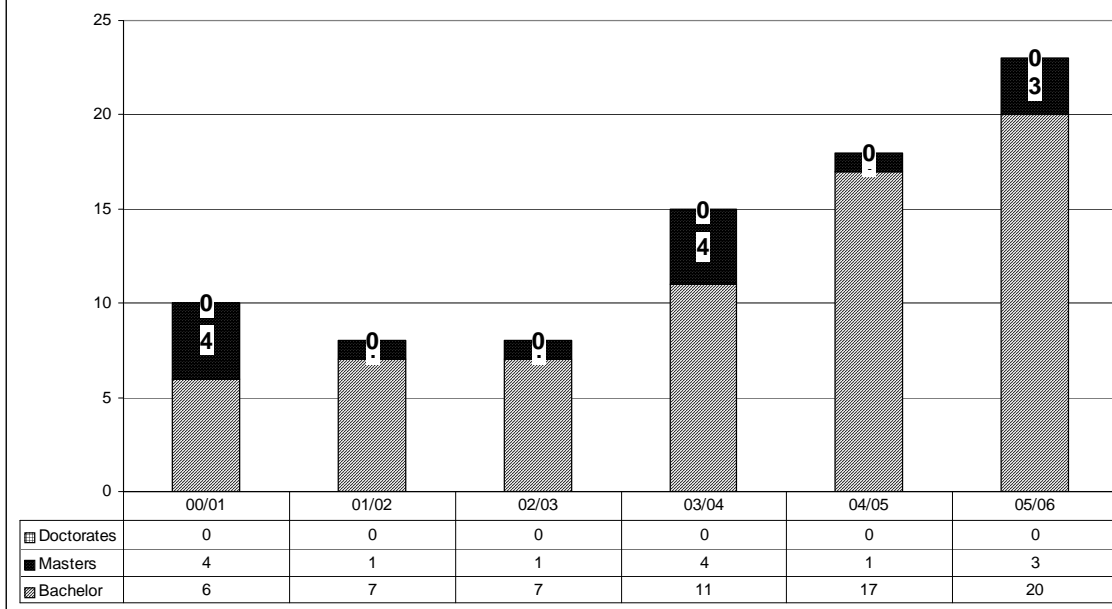
Total Degrees Awarded by Year - Academic Year (BIOLOGY)

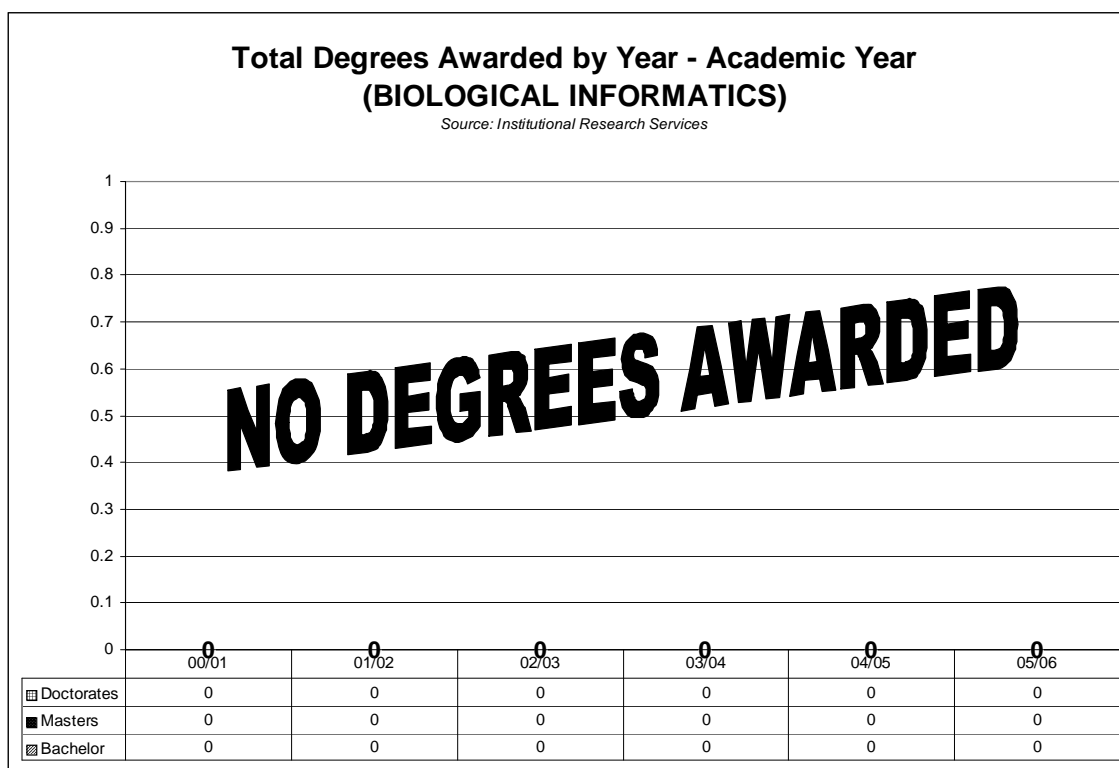
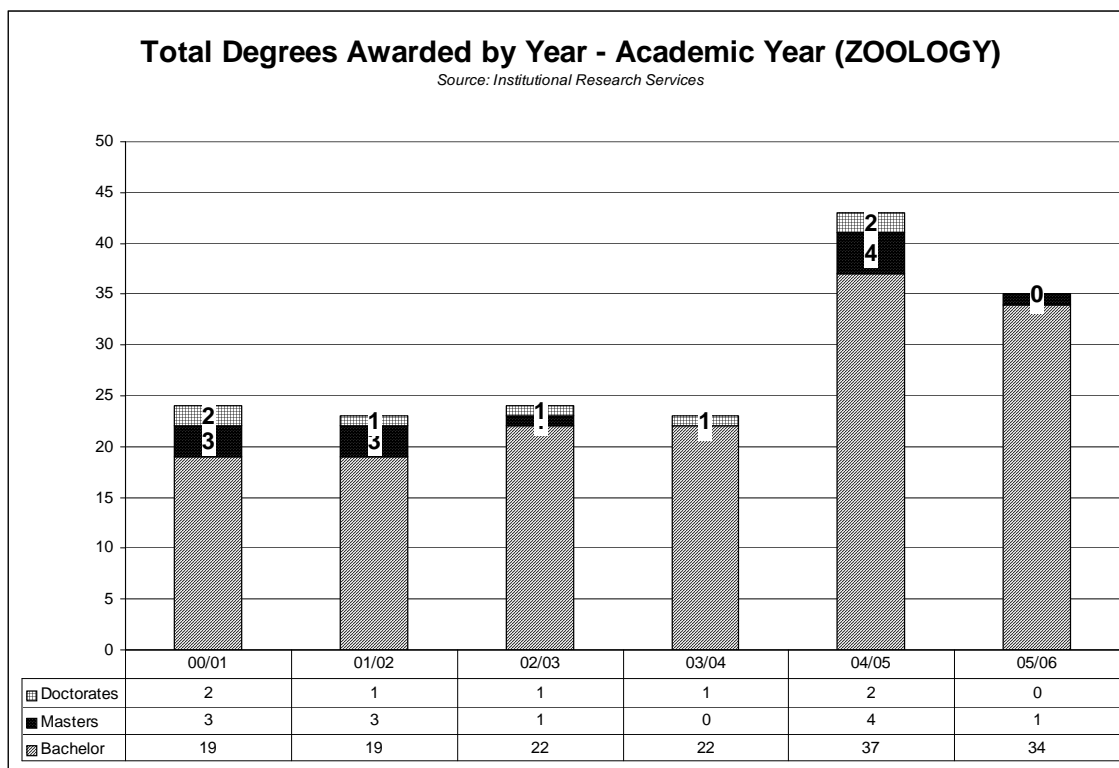
Source: Institutional Research Services



Total Degrees Awarded by Year - Academic Year (MICROBIOLOGY)

Source: Institutional Research Services





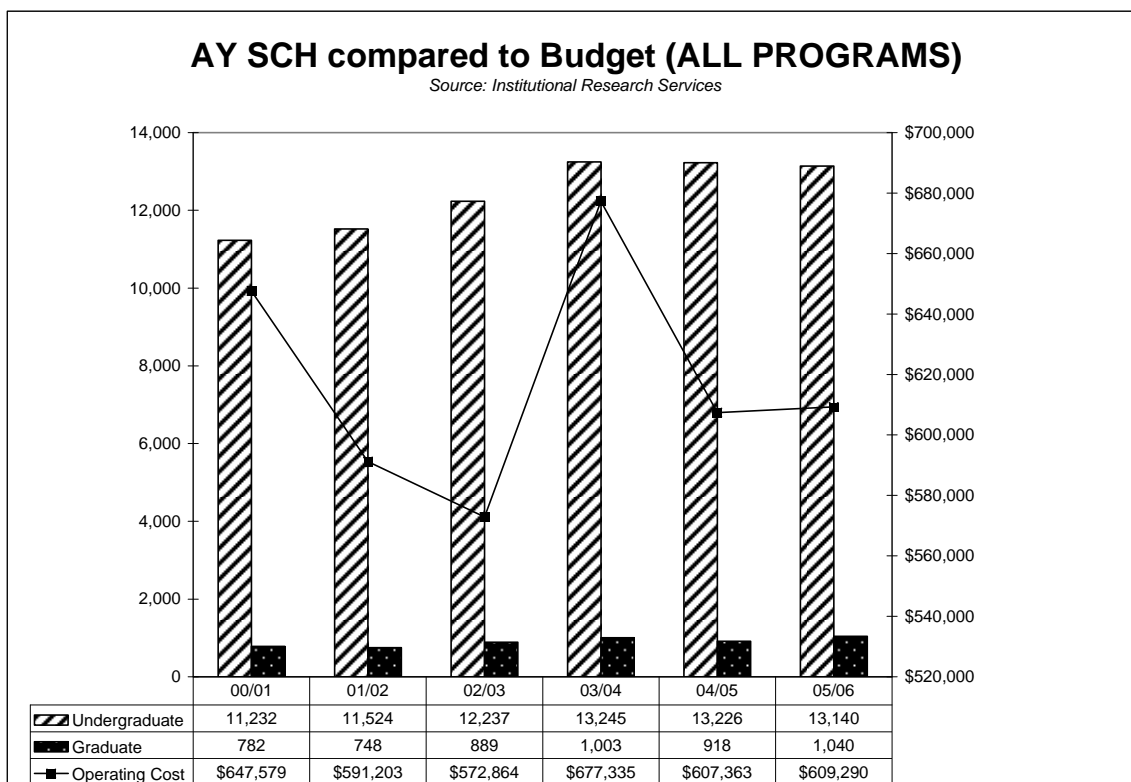
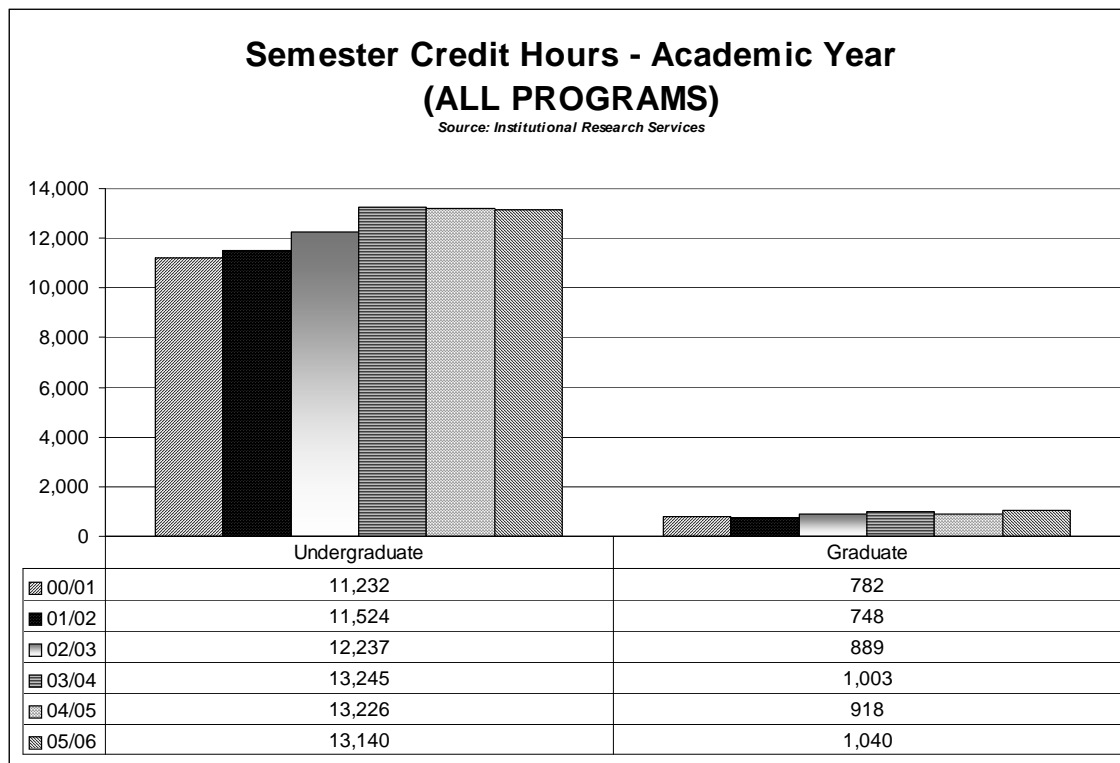
Comparison of Degrees Awarded - Fall Data	00/01	01/02	02/03	03/04	04/05	05/06
Louisiana State University						
Bachelor	240	307	302	328	303	307
Master	8	5	4	2	6	4
Doctoral	9	11	14	15	16	8
Oklahoma State University						
Bachelor	24	29	16	33	26	
Master	5	2	4	2	0	
Doctoral	0	1	1	1	0	
University of Missouri - Columbia						
Bachelor	140	144	165	190	198	201
Master	1	1	6	3	4	2
Doctoral	11	9	5	9	8	12
University of North Texas - Denton						
Bachelor	144	118	112	117	145	
Master	27	17	13	24	18	
Doctoral	13	14	9	14	9	
Texas Tech (TOTAL ALL PROGRAMS)						
Bachelor	96	96	89	104	137	167
Master	19	9	11	12	11	13
Doctoral	6	6	8	8	7	9

Program Degrees Awarded

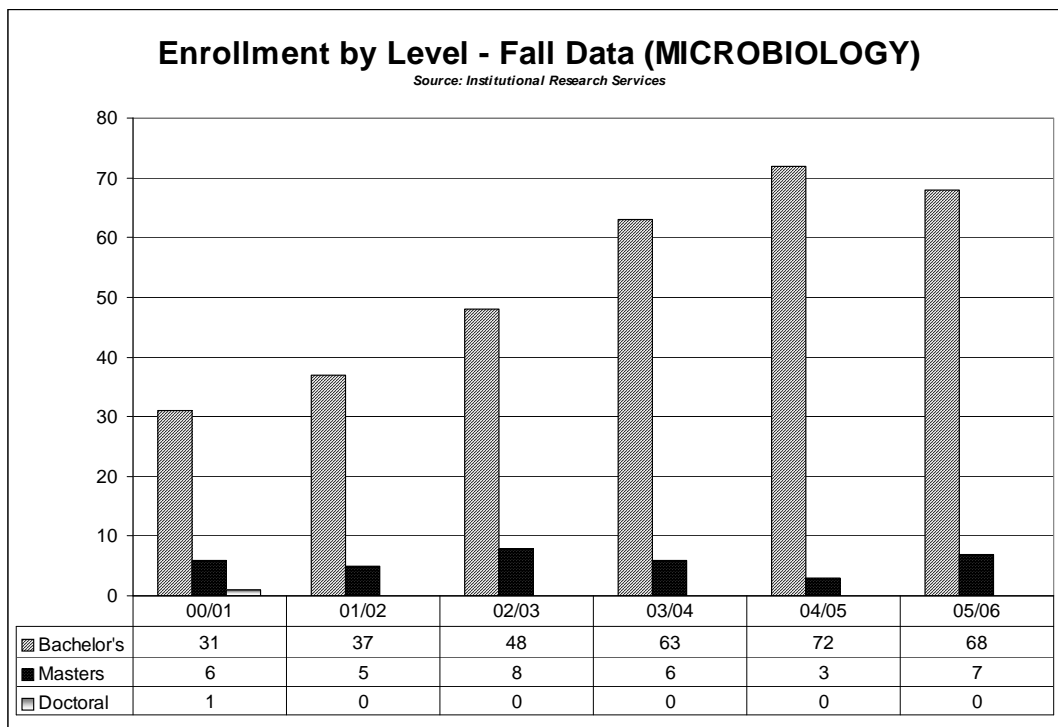
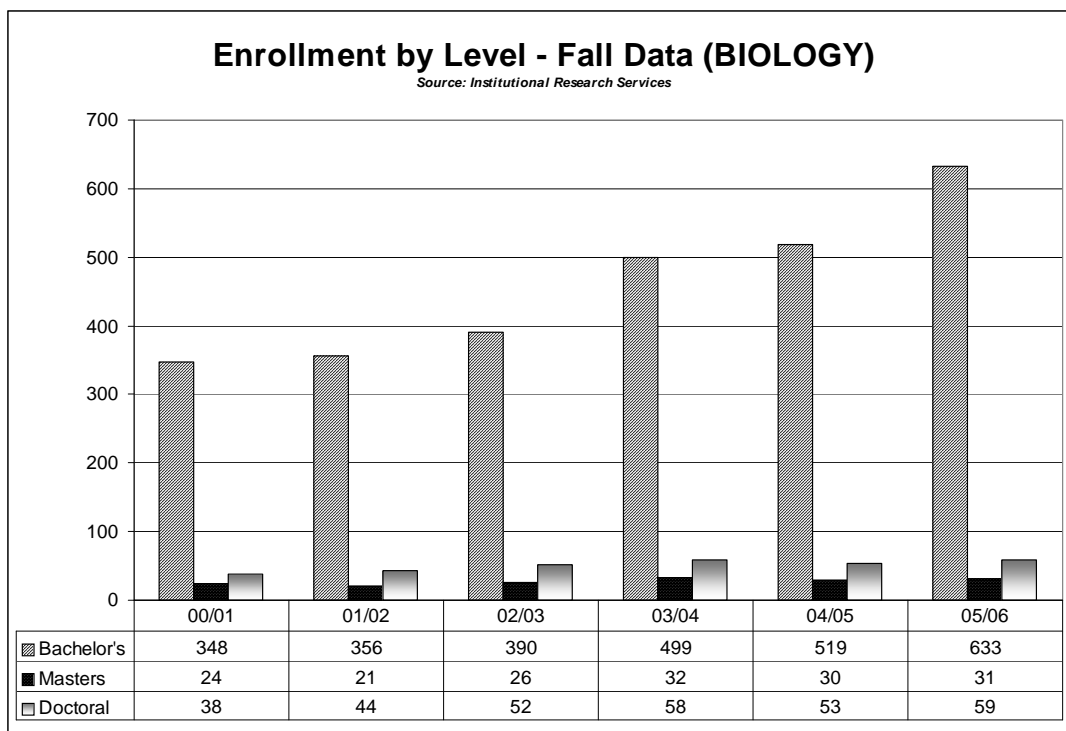
Source: Institutional Research Services

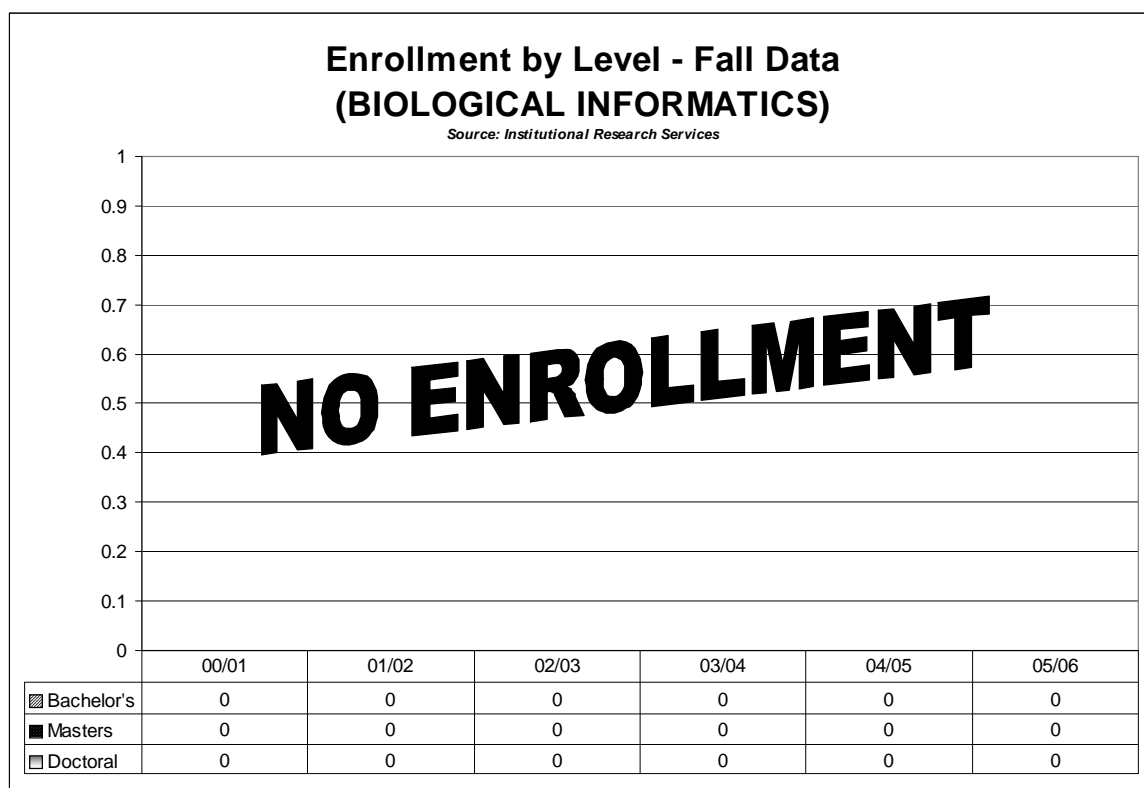
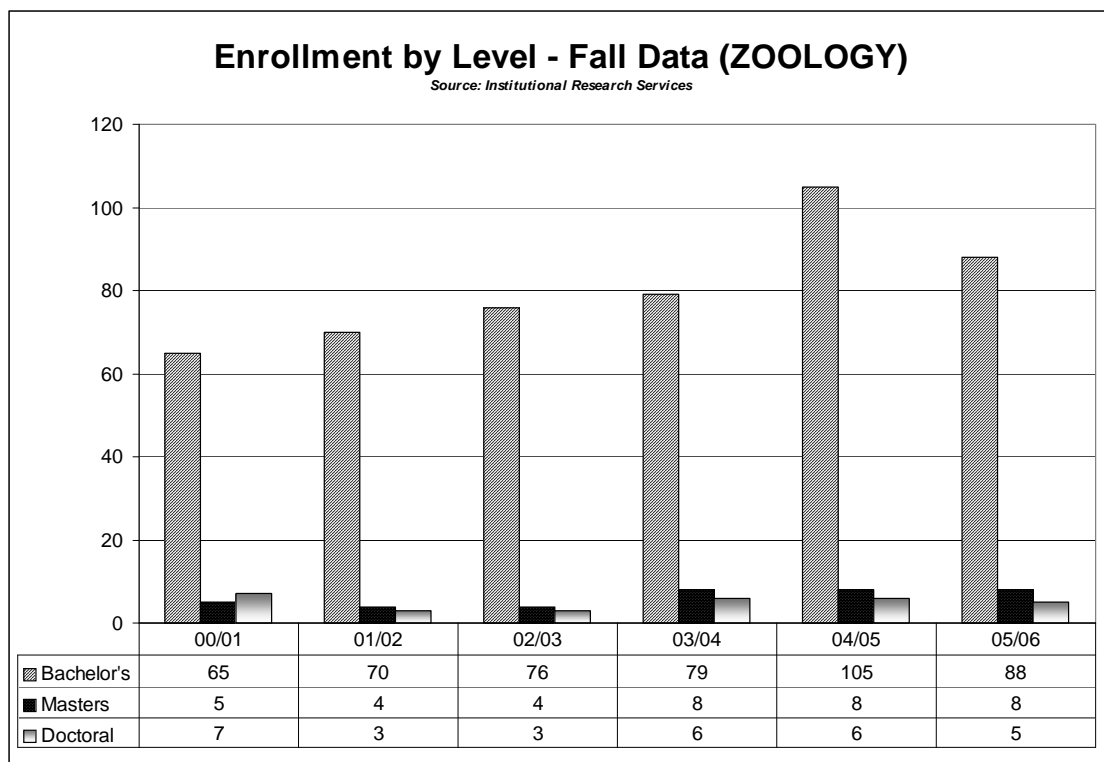
Name of Program	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Biology	16	10	16	15	11	18
Microbiology	4	1	1	4	1	3
Zoology	5	4	2	1	6	1
Informatics	0	0	0	0	0	0

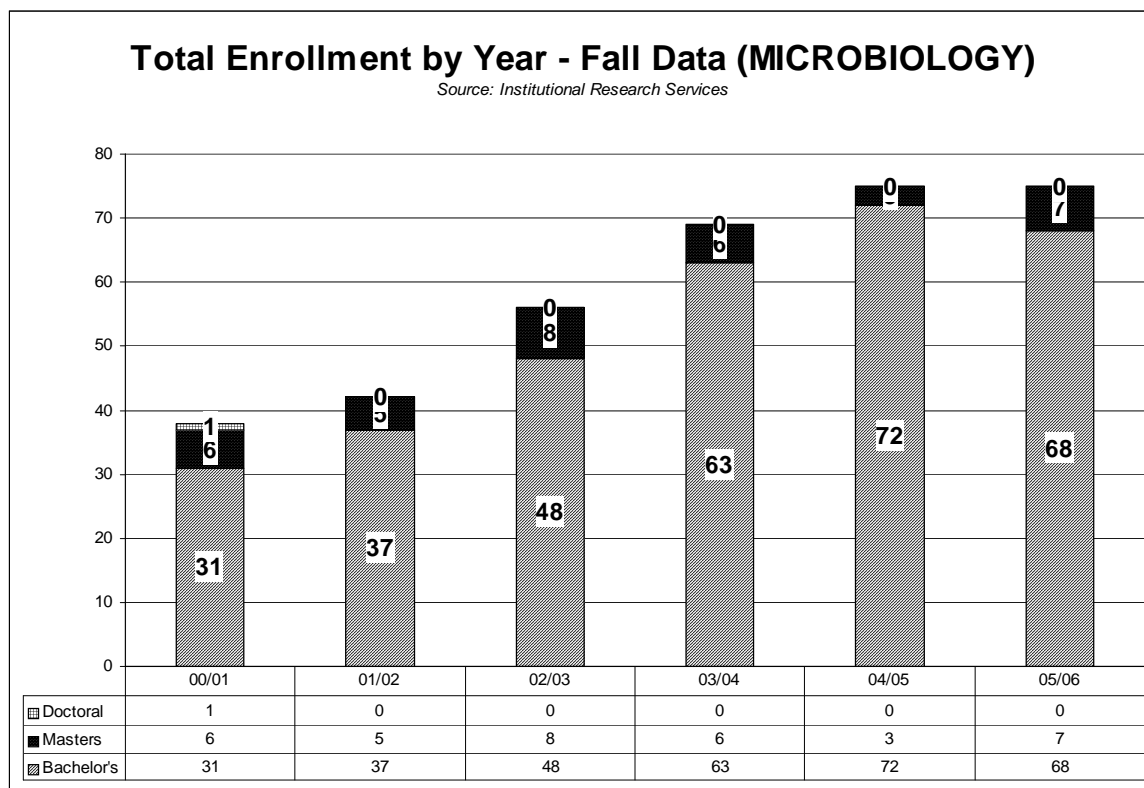
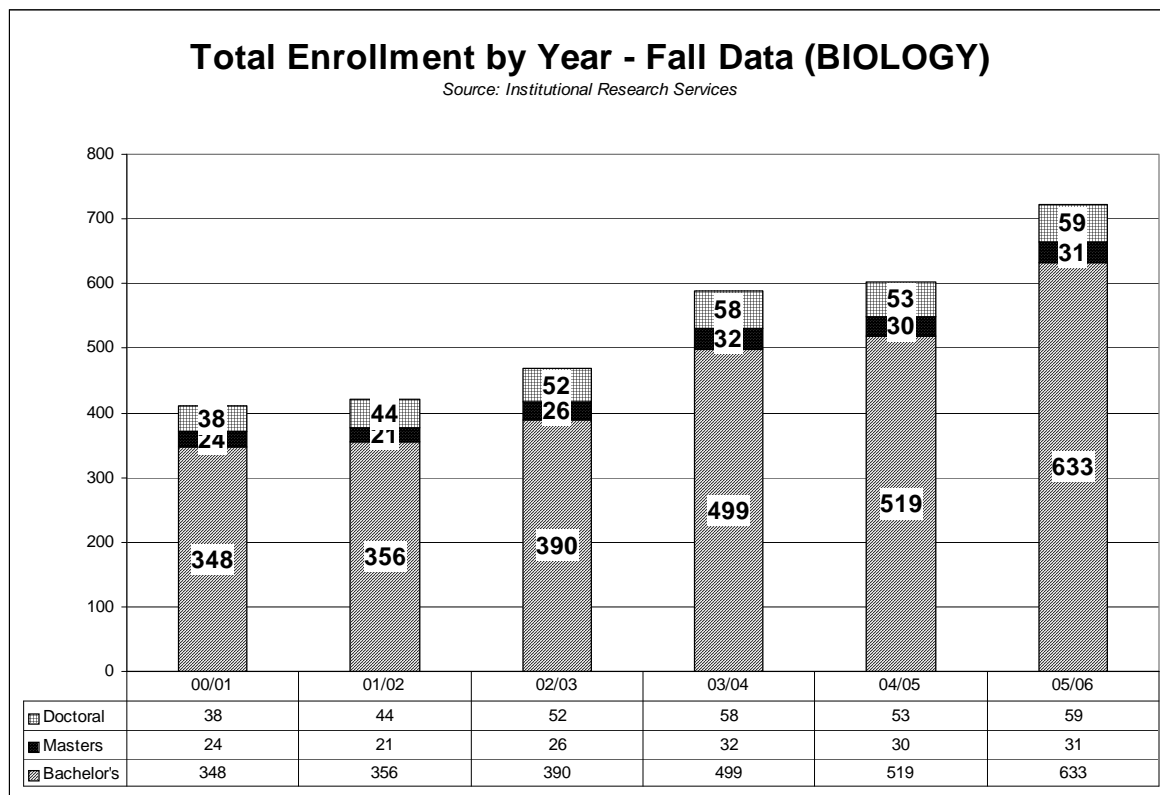
C. Undergraduate and graduate semester credit hours

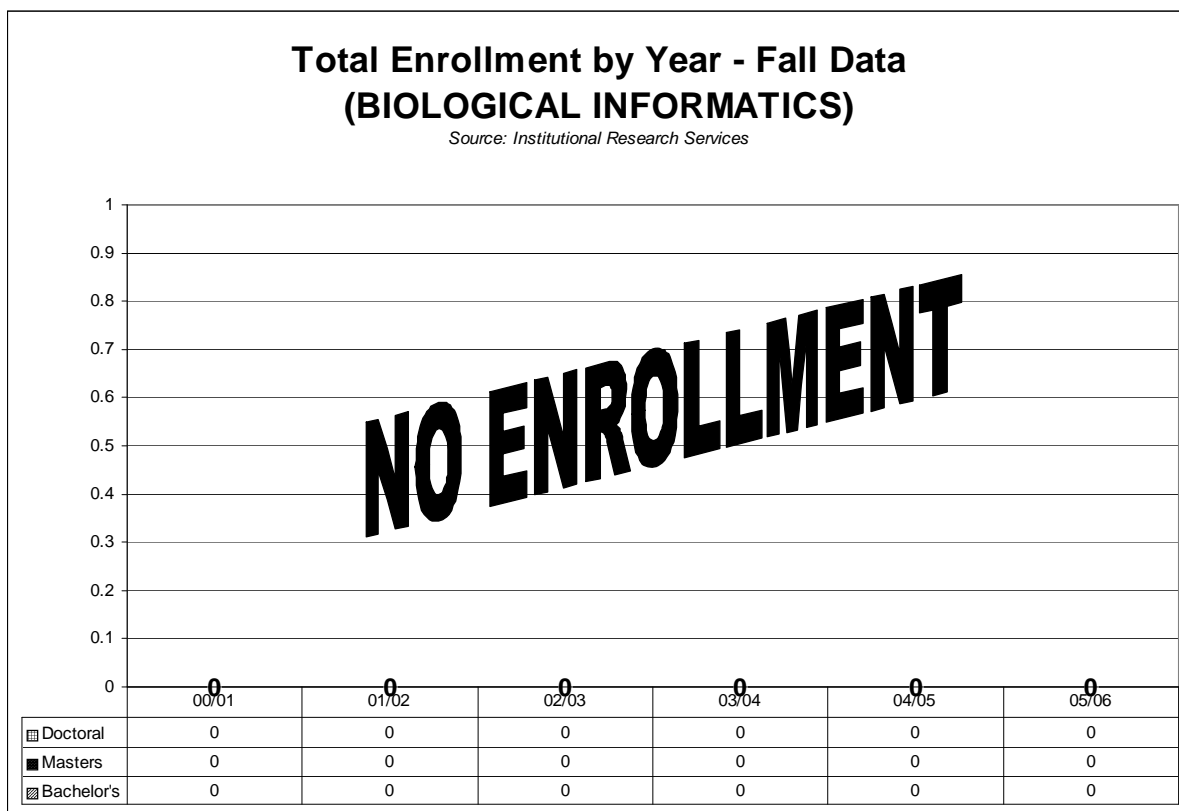
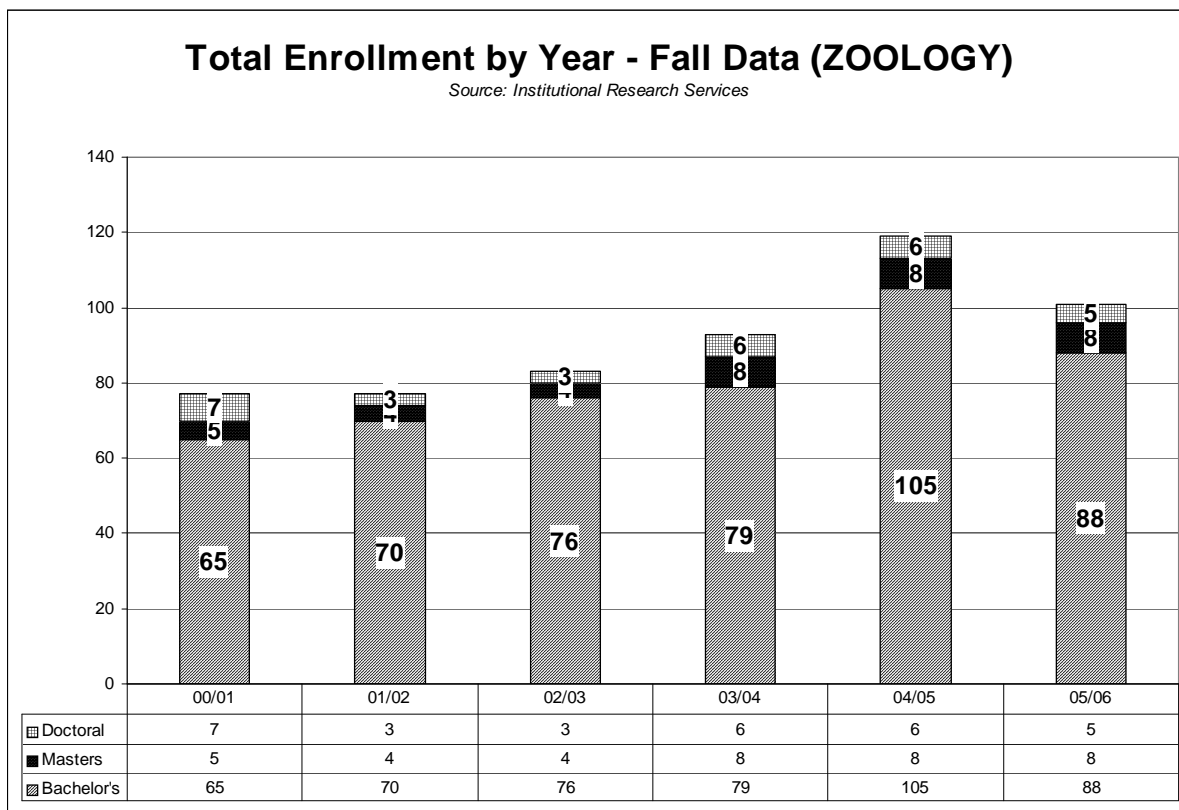


D. Number of majors in the department for the fall semesters









Comparison of Enrollment - Fall Data	00/01	01/02	02/03	03/04	04/05	05/06
Louisiana State University						
Bachelor	1106	1257	1314	1386	1449	1455
Master	34	13	10	9	7	12
Doctoral	95	103	105	116	131	141
Oklahoma State University						
Bachelor	94	100	98	112	120	
Master	13	13	13	17	15	
Doctoral	11	11	9	8	9	
University of Missouri - Columbia						
Bachelor	908	878	918	983	1024	1003
Master	10	8	8	12	11	10
Doctoral	59	54	59	67	77	67
University of North Texas - Denton						
Bachelor	947	957	1021	1149	1205	1312
Master	87	84	74	75	63	65
Doctoral	73	67	61	65	67	63
Texas Tech (TOTAL ALL PROGRAMS)						
Bachelor	444	463	514	641	696	789
Master	35	30	38	46	41	46
Doctoral	46	47	55	64	59	64

Program Enrollment

Source: Institutional Research Services

Name of Program	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Biology	62	65	78	90	83	90
Microbiology	7	5	8	6	3	7
Zoology	12	7	7	14	14	13
Informatics	0	0	0	0	0	0

E. Course enrollments over the past six years (enrollment trends by course)

- Figures are totals – classes may be offered more than once per year

Graduate Course Enrollment

Spring 2000		Summer 1 2000		Summer 2 2000		Fall 2000	
Biol 5301	1	Biol 6000	8	Biol 6000	5	Biol 5301	7
Biol 5302	9		2	Biol 6100	1	Biol 6000	12
Biol 5305	11		9	Biol 6301	4	Biol 6100	12
Biol 6000	14	Biol 7000	31	Biol 7000	21	Biol 6101	22
Biol 6100	5	Biol 8000	15	Biol 8000	14	Biol 6301	34
Biol 6101	27					Biol 7000	51
Biol 6301	6					Biol 8000	15
Biol 6309	11						
Biol 7000	53						
Biol 8000	15						
Bot 5401	1						
Mbio 5301	2					Mbio 5404	5
Mbio 6000	1					Mbio5408	5
						Mbio6306	5
Zool 6000	3	Zool 6000	1	Zool 6000	1	Zool 5306	5
						Zool 5312	7
						Zool 5401	5
Total	159	Total	66	Total	46	Total	185
Spring 2001		Summer 1 2001		Summer 2 2001		Fall 2001	
Biol 5301	2	Biol 6000	3	Biol 6000	5	Biol 5301	6
Biol 5302	8	Biol 6100	1	Biol 6100	1	Biol 5302	10
Biol 5305	5	Biol 6301	4	Biol6301	14	Biol 5309	3
Biol 5320	7	Biol 7000	42	Biol 7000	27	Biol 6000	9
Biol 6000	12	Biol 8000	11	Biol 8000	8	Biol 6100	4
Biol 6100	5					Biol 6101	37
Biol 6101	26					Biol 6202	21
Biol 6301	23					Biol 6301	26
Biol 6315	6					Biol 6309	18
Biol 6350	7					Biol 7000	58
Biol 6408	8					Biol 8000	13
Biol 7000	54						
Biol 8000	15						
Bot 5401	3					Bot 5401	3
Mbio 5301	2	Mbio 6000	1	Mbio 6000	1	Mbio 5301	5
Mbio 5401	3					Mbio 5408	5

Mbio 5403	5					Mbio 6000	2
Mbio 6000	1						
Mbio 6302	8						
Zool 5304	3	Zool 6000	2	Zool 6000	2	Zool 5312	5
Zool 6000	1					Zool 5401	4
Zool 6303	5					Zool 5406	2
Total	211	Total	64	Total	58	Total	231
Spring 2002		Summer 1 2002		Summer 2 2000		Fall 2002	
Biol 5301	4	Biol 6000	1	Biol 6000	2	Biol 5302	15
Biol 5302	11	Biol 6301	9	Biol 6100	1	Biol 5303	8
Biol 5320	5	Biol 7000	50	Biol 6301	3	Biol 5309	7
Biol 5407	2	Biol 8000	11	Biol 7000	42	Biol 5310	20
Biol 6000	11			Biol 8000	11	Biol 5311	11
Biol 6100	13					Biol 6000	6
Biol 6101	21					Biol 6100	12
Biol 6301	22					Biol 6101	17
Biol 6315	6					Biol 6202	23
Biol 6350	3					Biol 6301	24
Biol 6408	9					Biol 6309	28
Biol 7000	57					Biol 7000	62
Biol 8000	16					Biol 8000	15
Bot 5401	5					Bot 5401	5
Mbio 5301	2	Mbio 6000	1	Mbio 6000	2	Mbio 5301	4
Mbio 5403	4					Mbio 6000	2
Mbio 6302	8					Mbio 6306	6
Zool 5304	3					Zool 5306	5
Zool 5308	2					Zool 5312	4
Zool 5409	5						
Zool 5421	5						
Total	241	Total	72	Total	61	Total	373
Spring 2003		Summer 1 2003		Summer 2 2003		Fall 2003	
Biol 5301	8	Biol 6000	4	Biol 6000	5	Biol 5301	9
Biol 5302	9	Biol 6301	4	Biol 6301	7	Biol 5302	17
Biol 5305	9	Biol 7000	60	Biol 7000	59	Biol 5309	5
Biol 5320	14	Biol 8000	7	Biol 8000	9	Biol 5330	19
Biol 6000	9					Biol 6000	6
Biol 6100	7					Biol 6100	7
Biol 6101	21					Biol 6101	28
Biol 6301	7					Biol 6309	14
Biol 6315	10					Biol 6502	17
Biol 6408	21					Biol 7000	78

Biol 7000	69					Biol 8000	14
Biol 8000	12						
						Bot 5401	6
Bot 5401	6					Bot 5404	1
Mbio 5301	3	Mbio 6000	3	Mbio 6000	2	Mbio 5301	2
Mbio 5401	7					Mbio 5408	5
Mbio 5403	5					Mbio 6000	3
Mbio 6000	2					Mbio 6306	4
Mbio 6302	7						
						Zool 5306	7
Zool 5304	3					Zool 5312	3
Zool 5308	3					Zool 5401	1
Zool 5409	3					Zool 5406	3
Zool 5421	5						
Zool 6303	6						
Total	246	Total	75	Total	80		249
Spring 2004		Summer 1 2004		Summer 2 2004		Fall 2004	
Biol 5301	8	Biol 6000	4	Biol 6000	8	Biol 5301	4
Biol 5302	10	Biol 6301	1	Biol 6100	1	Biol 5302	7
Biol 5305	9	Biol 7000	55	Biol 6301	1	Biol 5305	3
Biol 5320	15	Biol 8000	13	Biol 7000	46	Biol 5309	1
Biol 6000	14			Biol 8000	8	Biol 6000	13
Biol 6100	14					Biol 6100	18
Biol 6101	25					Biol 6101	26
Biol 6301	36					Biol 6301	17
Biol 6408	16					Biol 6309	29
Biol 7000	75					Biol 7000	77
Biol 8000	16					Biol 8000	16
Bot 5401	3					Bot 5401	3
Mbio 5301	2					Mbio 5301	2
Mbio 5403	4					Mbio 5303	8
Mbio 6302	8					Mbio 5408	1
						Mbio 6306	1
Zool 5304	3	Zool 6000	2	Zool 6000	2	Zool 5306	3
Zool 5308	5					Zool 5312	6
Zool 5407	1					Zool 5401	3
Zool 5409	1					Zool 5406	2
Zool 5421	6						
Total	271	Total	192	Total	66	Total	240
Spring 2005		Summer 1 2005		Summer 2 2005		Fall 2005	
Biol 5301	3	Biol 6000	5	Biol 6000	6	Biol 5301	6

Biol 5302	9	Biol 6301	4	Biol 6301	6	Biol 5302	8
Biol 5305	4	Biol 7000	64	Biol 7000	51	Biol 5305	10
Biol 5306	3	Biol 8000	12	Biol 8000	7	Biol 5309	2
Biol 5309	1					Biol 6000	16
Biol 5320	8					Biol 6100	8
Biol 5407	7					Biol 6101	15
Biol 6000	16					Biol 6301	17
Biol 6100	14					Biol 7000	76
Biol 6101	18					Biol 8000	14
Biol 6301	20					Biol 8000	
Biol 6304	10						
Biol 6309	5						
Biol 6315	11						
Biol 6350	4						
Biol 6408	13						
Biol 7000	78						
Biol 8000	13						
Bot 5401	4					Bot 5401	11
Bot 6304	8						
Mbio 5301	2			Mbio 6000	1	Mbio 5301	8
Mbio 5401	1					Mbio 6000	2
Mbio 5403	12					Mbio 6306	3
Mbio 6000	1						
Mbio 6302	8						
Zool 5304	5						
Zool 5308	2					Zool 5312	3
Zool 5409	1					Zool 5401	4
Zool 5421	2					Zool 5406	1
Zool 6303	5						
Total	288	Total	85	Total	71	Total	204
Spring 2006		Summer 1 2006		Summer 2 2006		Fall 2006	
Biol 5301	5	Biol 6000	8	Biol 6000	3	Biol 5301	8
Biol 5302	6	Biol 6100	1	Biol 6301	3	Biol 5302	8
Biol 5305	5	Biol 6301	6	Biol 7000	38	Biol 5303	14
Biol 5306	6	Biol 7000	52	Biol 8000	10	Biol 6000	10
Biol 5309	2	Biol 8000	6			Biol 6100	6
Biol 5320	15					Biol 6101	22
Biol 6000	15					Biol 6202	24
Biol 6100	4					Biol 6301	28
Biol 6101	21					Biol 6309	32
Biol 6301	37					Biol 6392	4
Biol 6315	5					Biol 7000	65

Biol 6408	15					Biol 8000	14
Biol 7000	89						
Biol 8000	15						
Bot 5401	2					Bot 5401	2
Mbio 5301	4	Mbio 6000	1			Mbio 5404	3
Mbio 5403	3					Mbio 5408	9
Mbio 6000	2					Mbio 6000	4
Mbio 6302	5					Mbio 6306	4
Zool 5304	3					Zool 5306	7
Zool 5308	1					Zool 5312	2
Zool 5407	3					Zool 5401	3
Zool 5409	2					Zool 5406	1
Total	248	Total	74	Total	54	Total	270

F. Courses cross-listed

The Department of Biological Sciences has forty-six graduate classes available to our graduate students. Many of these classes are taught on an every-other year schedule so as not to compete for graduate students in any given year. Of the total number of graduate classes offered by our faculty, thirty are taught concurrent with their undergraduate component. In these concurrent courses graduate students have additional assignments that help them explore the subject matter in greater detail. The additional work may include reading and discussion of pertinent scientific literature, development of grant proposal related to course materials, oral presentations on selected topics chosen by faculty member, oral exams to help prepare students for candidacy exams and defenses. Student evaluations of all graduate courses are reviewed each semester by the chair to assess the quality of the course. In the last year the Department has developed a Graduate Curriculum Committee to assist with review of current and proposed graduate classes. New graduate course proposals will be reviewed by the committee, discussed with the Chair and brought to the entire graduate faculty for discussion before implementation as part of our graduate offerings.

CROSS LISTED GRADUATE AND UNDERGRADUATE CLASSES
 BIOLOGICAL SCIENCES
 FALL 2006

GRADUATE COURSES

BIOLOGY

5301	Advanced Genetics
5302	Advanced Cell Biology
5303	Advanced Experimental Cell Biol.
5305	Organic Evolution/Advanced Students
5306	Advanced Cancer Biology
5309	Advanced Ecology
5310	Advanced Community Ecology
5311	Ecology for Teachers
5312	Cell and Molecular Biology for Teachers
5320	Advanced Molecular Biology
5330	Advanced Landscape Ecology
5405	Systems Ecology
5407	Advanced Population Biology
6202	Preparation for Graduate Teaching And Learning in Biology
6301	Advanced Topics in Biology
6304	Principles and Practice of Phylogenetic Systematics
6309	Advanced Topics in Quantitative Biology
6315	Regulation of Gene Expression
6350	Advanced Physiological Plant Ecology
6392	Marine Biology
6408	Research Techniques in Electron Microscopy
6502	Biometry

BOTANY

5401	Advanced Plant Physiology
6301	Advanced Plant Development
6302	Advanced Field Botany
6304	Advanced Plant Molecular Biology

MICROBIOLOGY

5301	Advanced General Microbiology
5303	Microbe-Plant Interactions
5401	Current Perspectives in Microbial Ecology
5403	Immunobiology
5404	Pathogenic Microbiology
5408	Microbial Genetics
6302	Advanced Bacterial Physiology
6306	General Virology

UNDERGRAD CONCURRENT

BIOLOGY

3416	Genetics
3320	Cell
3310	Experimental Cell
4305	Organic Evolution
4307	Cancer Biology
3309	Principles of Ecology
4310	Community Ecology
4320	Molecular Biology
4330	Landscape Ecology
3307	Population Biology
4350	Physiological Plant Ecology
4392	Marine Biology
3401	Plant Physiology
3409	Plant Development
4302	Field Botany
4304	Plant Molecular Biology
3401	Principles of Micro
4401	Microbial Ecology
4402	Immunology and Serology
4404	Pathogenic Micro
4406	Genetics of Microbes
4303	Physiology of Bacteria
4310	Intro to Virology

GRADUATE COURSES

ZOOLOGY

- 5304 Comparative Endocrinology
- 5306 Advanced Mammalogy
- 5308 Advanced Ornithology
- 5312 Advanced Animal Behavior
- 5401 Animal Histology for Advanced Students
- 5406 Advanced Invertebrate Zoology

- 5407 Vertebrate Zoology for Advanced Students
- 5409 Comparative Physiology for Advanced Students

- 5421 Ecological Entomology
- 6302 Principles of Systematic Zoology/Advanced Students
- 6303 Seminar in Mammalogy for Advanced Students
- 6320 Comparative Neuroanatomy
- 6321 Advanced Herpetology

UNDERGRADUATE COURSES

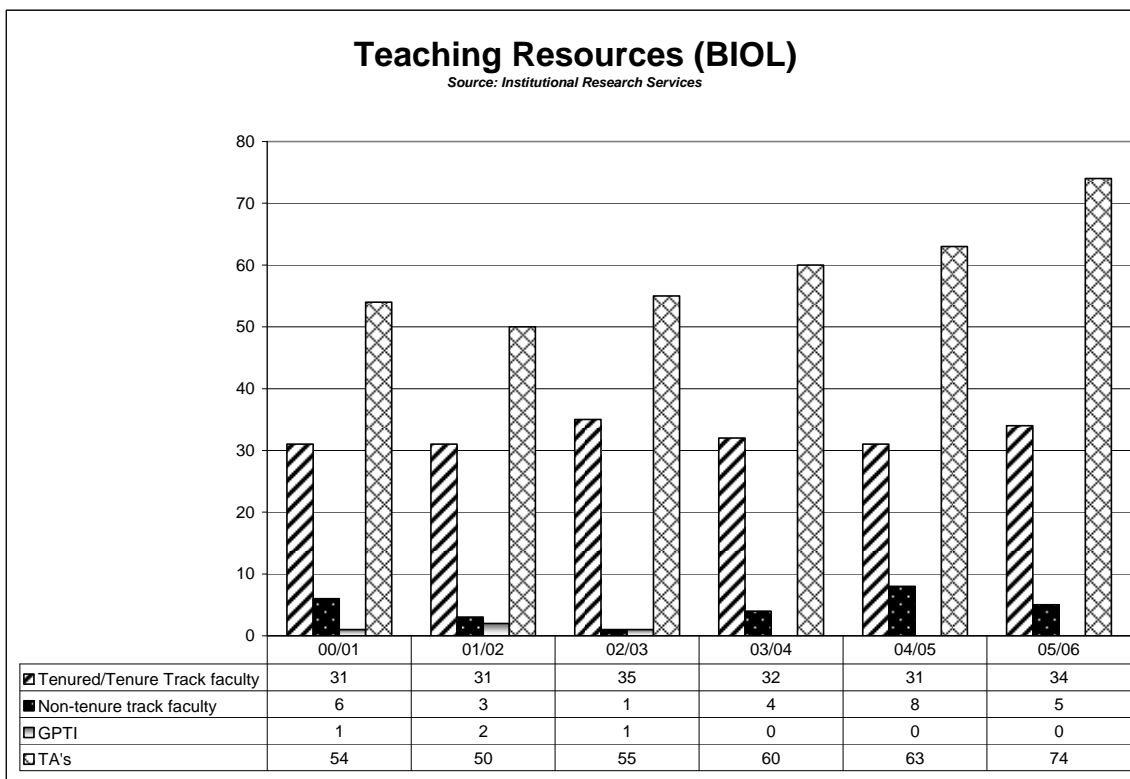
ZOOLOGY

- 4304 General Endocrinology
- 4406 Intro to Mammalogy
- 4408 General Ornithology
- 4312 Animal Behavior
- 3401 Animal Histology
- 3406 Comparative Invertebrate Zoology

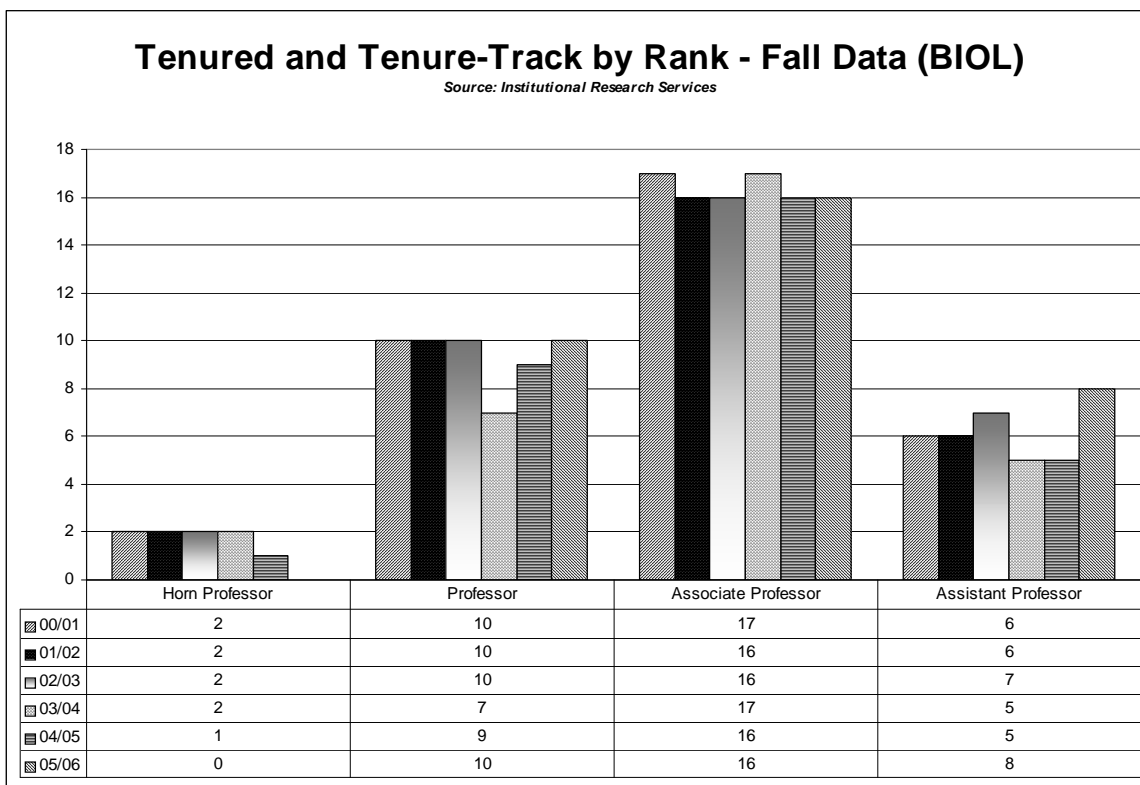
- 4409 Comparative Animal Physiology
- 4321 Insect Diversity

III. Faculty

A. Number, rank, and demographics of the graduate faculty



(see Note on next page regarding Non-tenure track numbers)



Comparison of Full-time Faculty	00/01	01/02	02/03	03/04	04/05	05/06
Colorado State University						
Tenure/Tenure Track		28	29	22.5	23.5	23
Non-tenure track	4	5	4	5	5	5
TA's	N/A	28	25	29	29	29
Louisiana State University						
Tenure/Tenure Track	54	58	56	60	63	62
Non-tenure track	17	16	14	14	14	16
TA's	66	73	72	75	76	77
Oklahoma State University						
Tenure/Tenure Track	9	9	10	10	10	12
Non-tenure track	1	2	2	3	3	3
TA's	12	12	12	12	14	14
University of Missouri - Columbia						
Tenure/Tenure Track	5	5	4	4	4	5
Non-tenure track	12	13	17	13	13	11
TA's	6	4	7	7	12	7
University of North Texas - Denton						
Tenure/Tenure Track	22	21	22	24	25	25
Non-tenure track	2	3	3	2.5	2	1.75
TA's	75	75	77	79	80	80
Texas Tech						
Tenure/Tenure Track	31	31	35	32	31	34
Non-tenure track	6	3	1	4	8	5
GPTI's	1	2	1	0	0	0
TA's	54	50	55	60	63	74

(see **Note** below regarding TTU Non-tenure track numbers)

Note: We believe the **Non-tenure track** faculty numbers for our department to be as follows:

00/01	01/02	02/03	03/04	04/05	05/06
0	0	4	4	4	5

We feel the numbers provided by Institutional Research are inaccurate because they represent most, but not all of our Teaching Assistants for the laboratory portions of our classes. Graduate students DO NOT teach courses during our long semesters. Institutional Research lists our TAs as Non-Tenured faculty since they are paid from our faculty salary account. Beginning in 2002-2003, we initiated our Teaching Post-Doctoral Fellows Program, which accounts for the 4 non-tenure track faculty for and subsequent years.

B. List of faculty members

FACULTY NAME	JOB TITLE	HIRE DATE	END DATE	Member of Grad Faculty? Y or N
Veronica Acosta-Martinez	Adjunct Professor	5/1/05		Y
Randy Allen	Professor	9/1/89		Y
Thomas Arsuffi	Adjunct Professor	6/1/05		Y
Momchil Atanassov	Teaching Post-Doc. Fellow	9/1/03		N
Robert Baker	Horn Professor	9/1/67		Y
Shan Bilimoria	Associate Professor	11/1/77		Y
Richard Larry Blanton	Professor	9/1/89	6/1/02	Y
Chris Bloch	Teaching Post-Doc. Fellow	7/1/03	8/31/06	N
Robert Bradley	Professor	9/1/94		Y
John Burns	Provost Emeritus and Professor	6/1/69	5/1/06	Y
Charles Cannon	Assistant Professor	9/1/02		Y
Jim Carr	Professor	9/1/91		Y
Ron Chesser	Professor	10/01/00		Y
Nathan Collie	Associate Professor	7/16/91		Y
Ravi Dani	Teaching Post-Doc. Fellow	9/1/03		N
Richard Deslippe	Associate Professor	9/1/96		Y
Llewellyn Densmore	Professor & Associate Chair	9/1/85		Y
Sandra Diamond-Tissue	Associate Professor	9/1/98		Y
Michael Dini	Associate Professor	9/1/02		N
Lauren Gollahon	Associate Professor	9/1/07		Y
Candice Haigler	Professor	9/1/86	7/1/02	Y
Caryl Heintz	Professor and Associate Dean, A&S	9/1/75		Y
Lewis Held	Associate Professor	9/16/87		Y
A. Scott Holaday	Professor & Associate Chair	1/1/83		Y
Marilyn Houck	Associate Professor	9/1/91	7/31/02	Y
Randall Jeter	Associate Professor	9/1/85		Y
Clyde Jones	Horn Professor Emeritus	9/1/82	5/31/03	Y
Madhukar Khetmalas	Teaching Post-Doc. Fellow	9/1/03	8/31/05	N

Tigga Kingston	Assistant Professor	9/1/06		Y
William Lemon	Assistant Professor	9/1/05	8/31/06	Y
Rex McAliley	Teaching Post-Doc. Fellow	9/1/06		N
Mark McGinley	Associate Professor	9/1/91		Y
Nancy McIntyre	Associate Professor	9/1/00		Y
Melvin Oliver	Adjunct Professor	2/7/03	1/1/06	Y
Robert Owen	Associate Professor	9/1/91	8/31/06	Y
Robert Owen	Adjunct Professor	9/1/06		Y
Megha Parajulee	Adjunct Professor	7/1/04		Y
Reynaldo Patino	Professor – COOP Unit	9/1/90		Y
Paxton Payton	Adjunct Professor	2/7/03		Y
Carleton Phillips	Professor	7/1/98		Y
Brian Reilly	Associate Professor	9/1/00		Y
Sean Rice	Associate Professor	9/1/05		Y
Chris Rock	Associate Professor	11/1/02		Y
Brenda Rodgers	Visiting Assistant Professor	9/1/06		Y
Julie Rosenheimer	Associate Professor	9/1/05		N
Michael Rylander	Professor Emeritus	9/1/65	5/31/04	Y
Michael San Francisco	Professor and Director of the TTU-HHMI Program	9/1/90		Y
Jorge Salazar-Bravo	Assistant Professor	1/1/03		Y
Kenneth Schmidt	Assistant Professor	9/1/02		Y
Dean Smith	Professor & VP for Research	9/1/05		Y
Richard Strauss	Associate Professor	9/1/92		Y
David Tissue	Associate Professor	9/1/96		Y
Michael Willig	Professor	9/1/83	9/1/05	Y
Zhixin Xie	Assistant Professor	9/1/05		Y
John Zak	Professor and Chair	9/1/86		Y
Hong Zhang	Associate Professor	1/1/95		Y
Kai Zhang	Assistant Professor	9/1/06		Y
Craig Zimmermann	Teaching Post-Doc. Fellow	1/1/03		N

C. Summary of the number of referred publications and creative activities.

Publication Type	2000 N= 32 F= 34	2001 N= 31 F=31	2002 N= 36 F= 38	2003 N= 32 F= 34	2004 N= 33 F= 33	2005 N= 33 F= 37
Referred Articles/Abstracts	61	105	105	89	110	131
Books/Book Chapters	1	5	20	2	20	4
Other Publications	1	0	35	31	21	13
Presentations/Posters	57	84	82	107	112	91
Invited Talks	9	17	52	31	43	55
<insert extra here>						
<insert extra here>						
N = # of full time faculty contributing F = # of full time faculty in department						

D. Responsibilities and leadership in professional societies

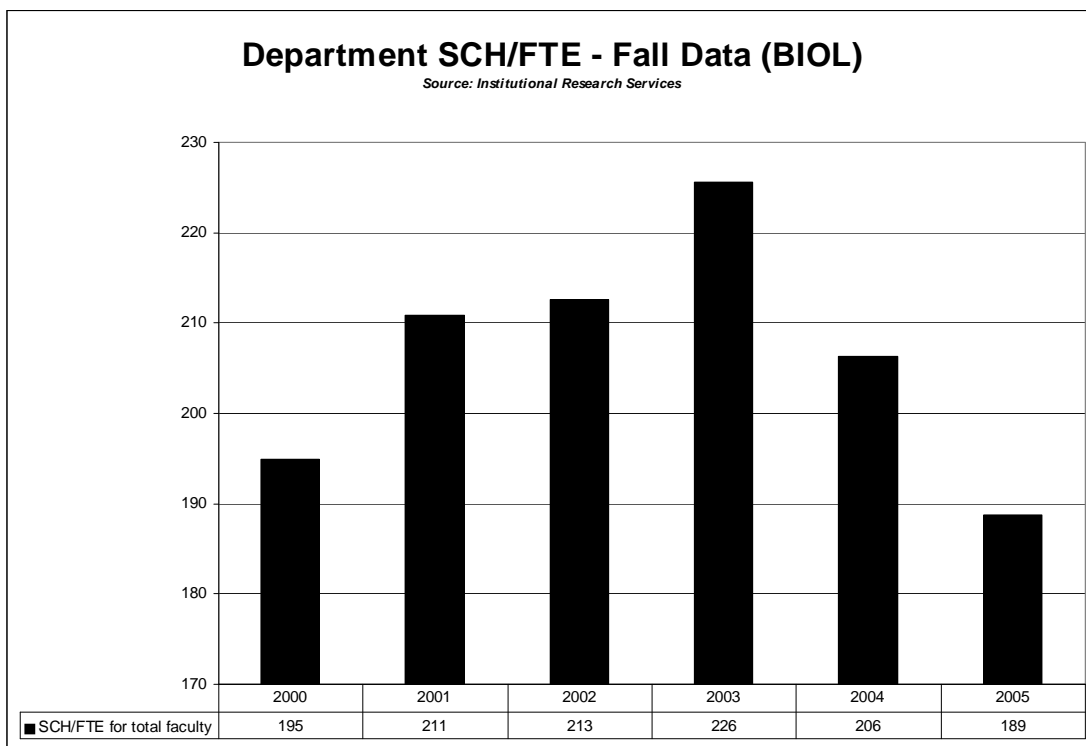
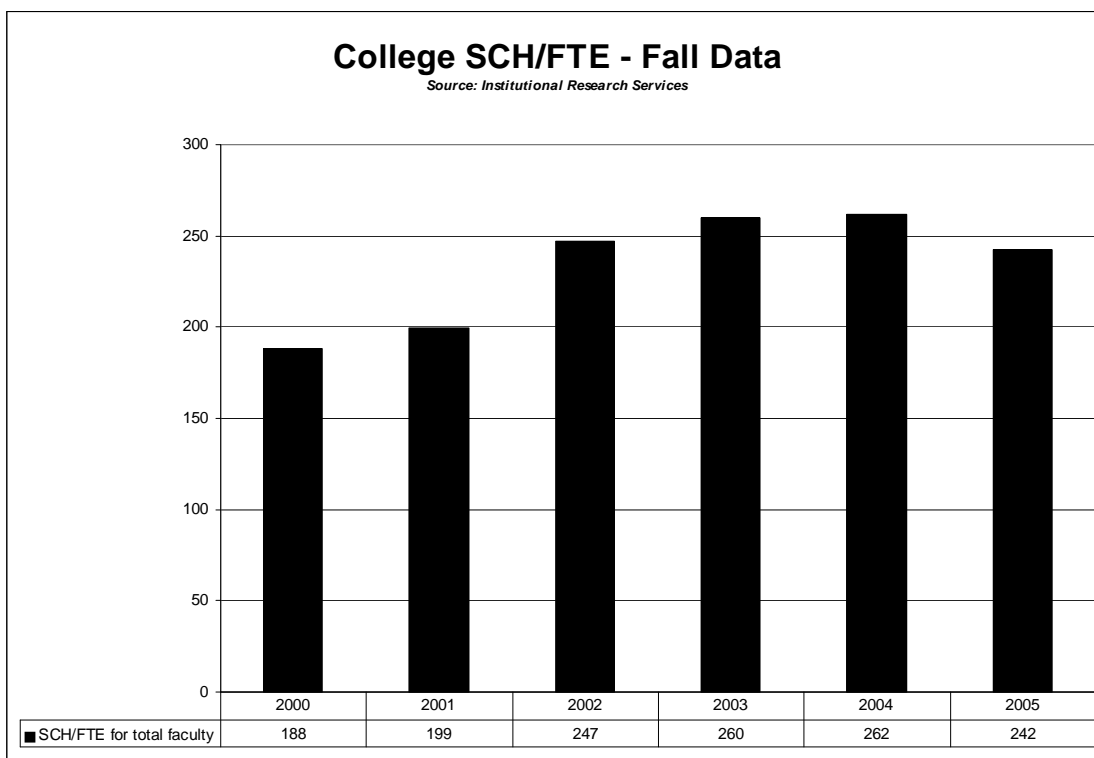
Professional Leadership	2000 N= 14 F= 34	2001 N= 12 F= 31	2002 N= 13 F= 38	2003 N= 9 F=34	2004 N= 10 F= 33	2005 N= 11 F= 37
Editor/Editorial	18	14	28	7	19	16
Executive Board						
Officer in National Org.	27	15	20	8	15	18
Committees						
Grant Review Panels	8	0	5	0	11	11
<insert extra here>						
<insert extra here>						
N = # of full time faculty contributing F = # of full time faculty in department						

Faculty Name	Committees Chaired		Committees Served in Department		Committees Served outside Department	
	MS	PhD	MS	PhD	MS	PhD
Allen	4	10	6	24	8	19
Baker	10	15	2	4	0	0
Bilimoria	2	3	0	0	0	0
Blanton	0	1	1	2	0	0
Bradley	5	4	1	10	1	0
Burns	0	0	0	0	0	0
Cannon	1	2	1	1	0	0
Carr	3	1	0	2	0	3
Chesser	1	1	0	0	0	0
Collie	1	2	1	5	0	2
Densmore	2	6	3	5	3	2
Deslippe	6	2	0	6	2	0
Diamond	2	3	0	1	0	0
Gollahon	4	5	3	2	0	0
Haigler	1	1	2	4	0	0
Heintz	2	0	0	0	1	0
Held	1	0	0	1	0	0
Holaday	2	3	2	9	0	0
Houck	2	2	3	4	0	0
Jeter	6	2	4	3	1	1
Jones	0	2	2	3	0	0
Lemon	0	0	0	0	0	0
McGinley	3	1	0	1	2	0
McIntyre	3	3	4	5	1	7
Owen	4	2	1	1	0	0
Parker	1	3	1	3	1	0
Patino	0	1	1	3	6	10
Phillips	0	2	1	0	0	0
Reilly	2	3	4	2	0	4
Rice	0	0	0	1	0	0
Rock	1	5	0	2	0	0
Rosenheimer	0	0	0	0	0	0
Rylander	2	0	2	2	0	0
Salazar	1	3	2	3	0	0
San Francisco	10	5	5	7	0	9
Schmidt	2	1	4	1	0	0
Smith	0	0	0	0	0	3
Strauss	2	4	3	24	0	6
Tissue	3	3	0	4	0	1
Werth	0	0	0	0	0	0
Willig	6	4	3	4	0	0
Xie	0	0	0	0	0	0
Zak	7	3	4	6	0	2
Zhang	3	9		7	1	8

E. Assess average faculty productivity for Fall semesters only (use discipline appropriate criteria to determine)

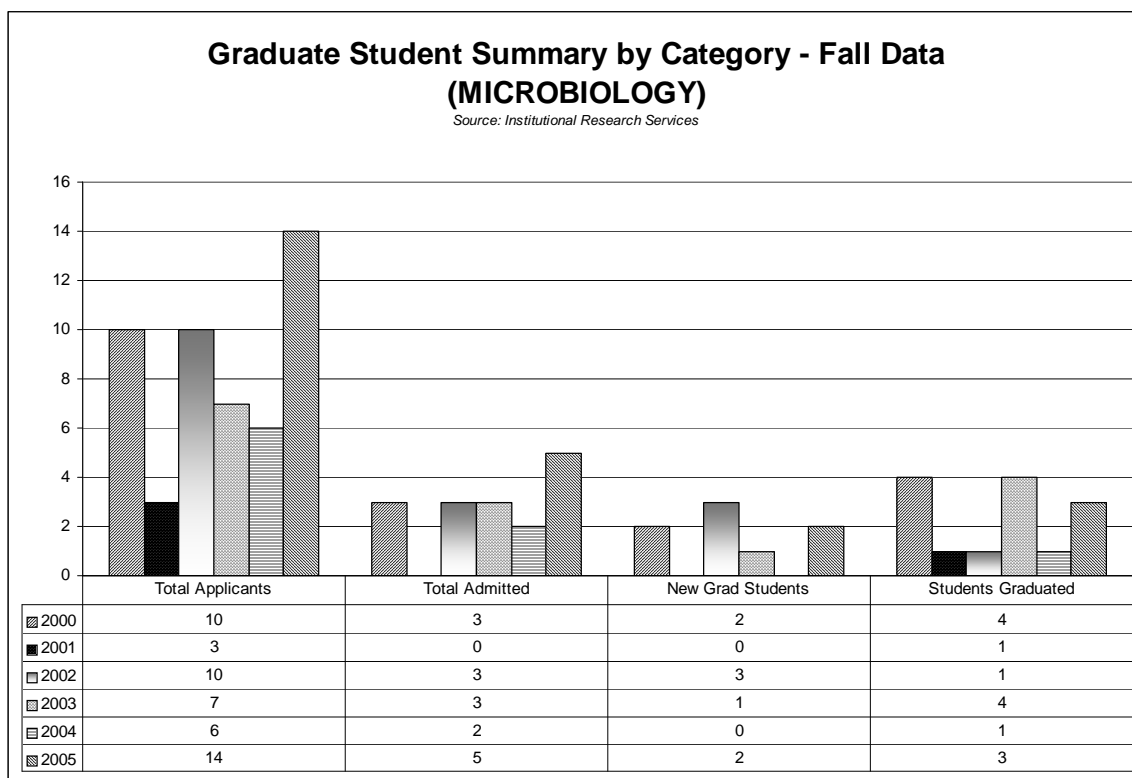
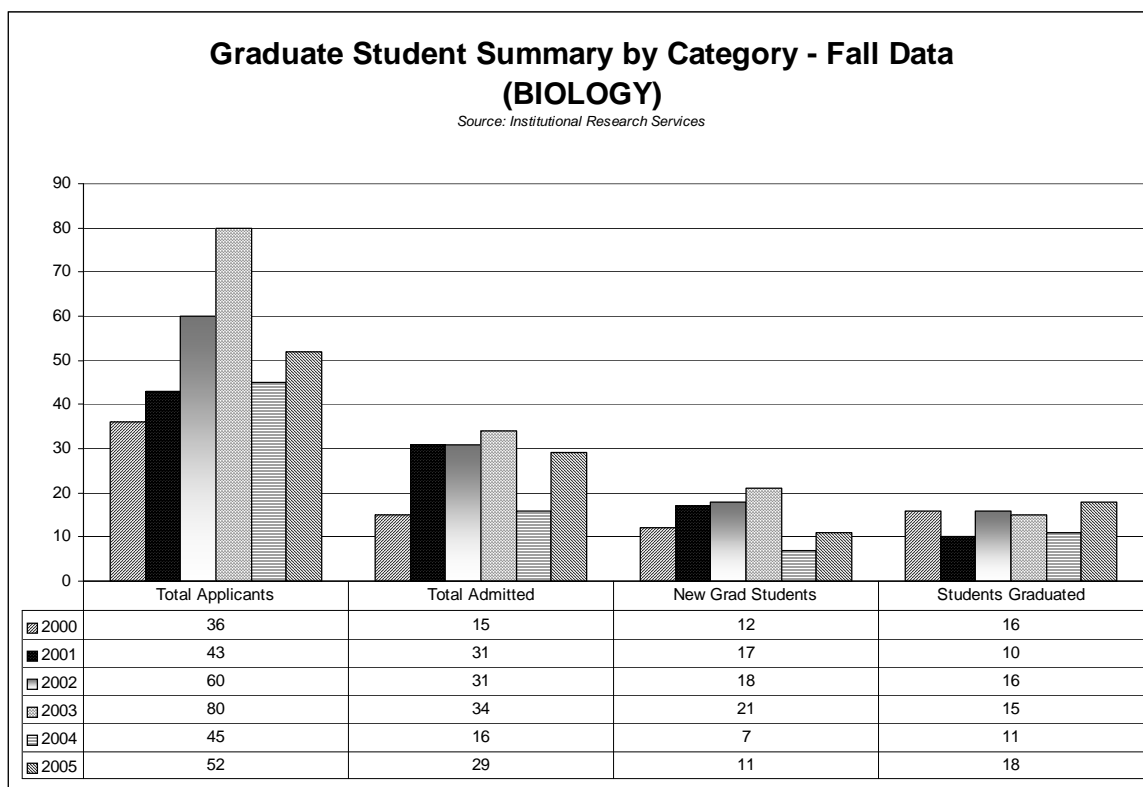
FACULTY WORKLOAD

	2000	2001	2002	2003	2004	2005
University	11.61	11.45	11.34	12.24	16.23	15.82
College	11.16	10.68	10.43	10.63	17.39	17.18
Department	10.43	10.14	12.66	14.06	24.25	22.99



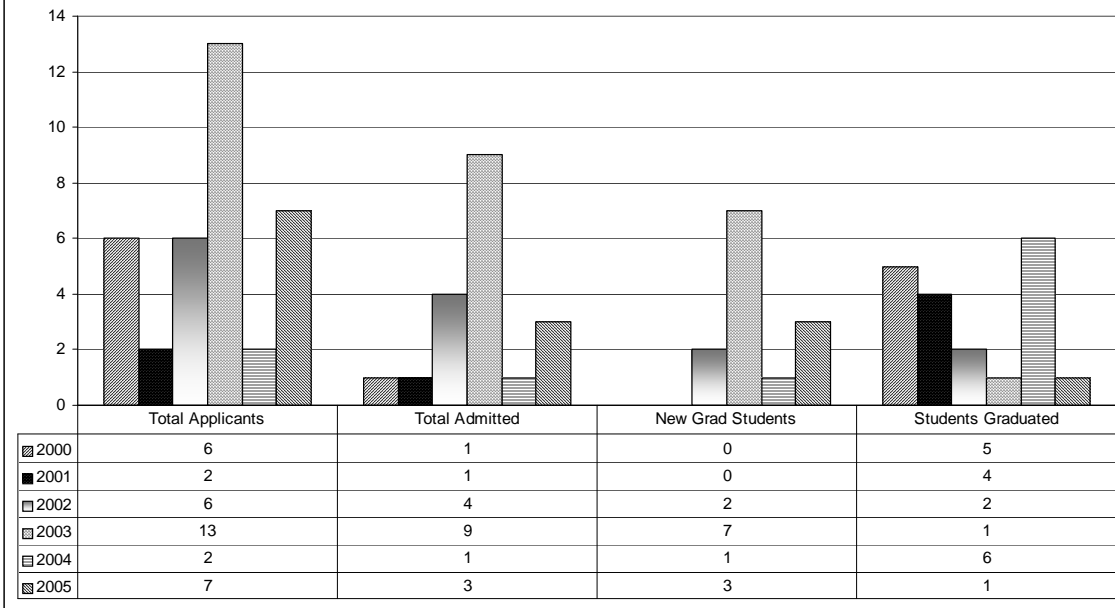
IV. Graduate Students

A. Demographics of applicants and enrolled students



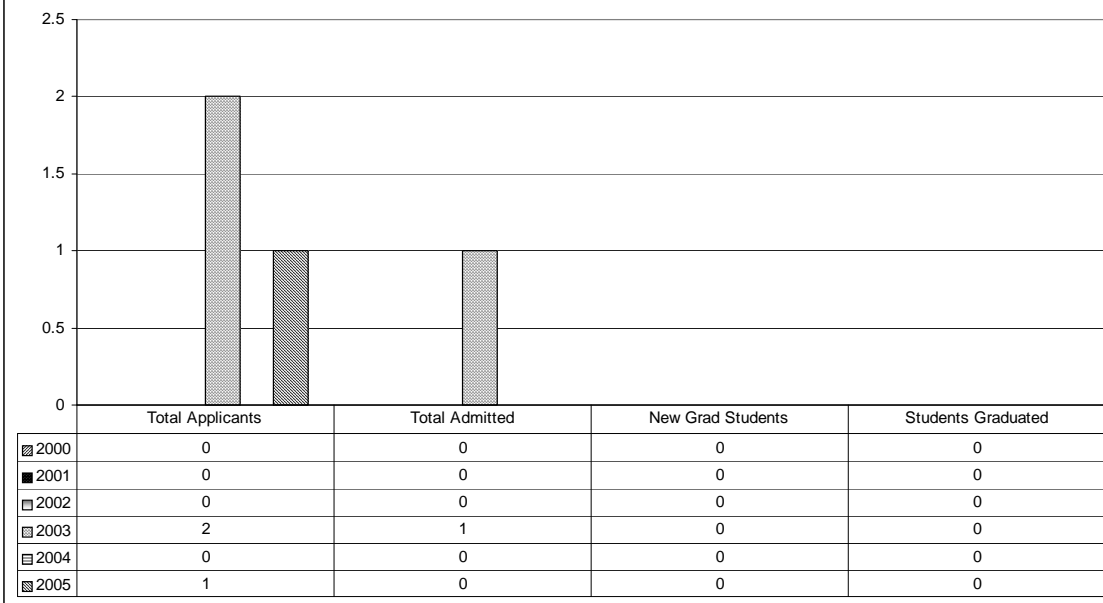
Graduate Student Summary by Category - Fall Data (ZOOLOGY)

Source: Institutional Research Services



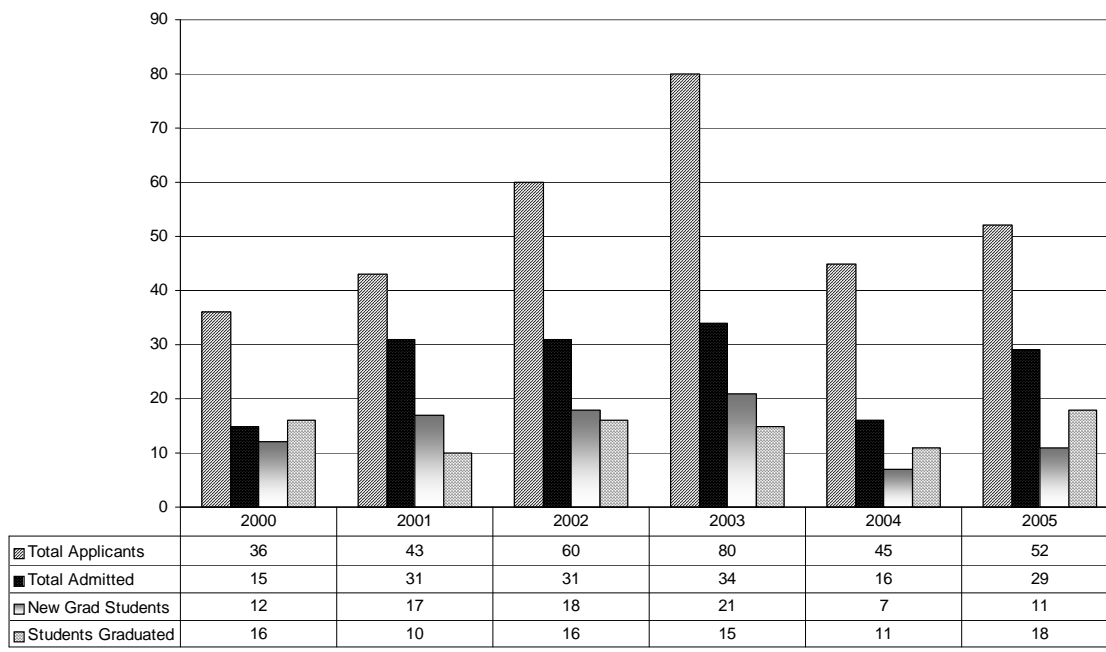
Graduate Student Summary by Category - Fall Data (BIOLOGICAL INFORMATICS)

Source: Institutional Research Services



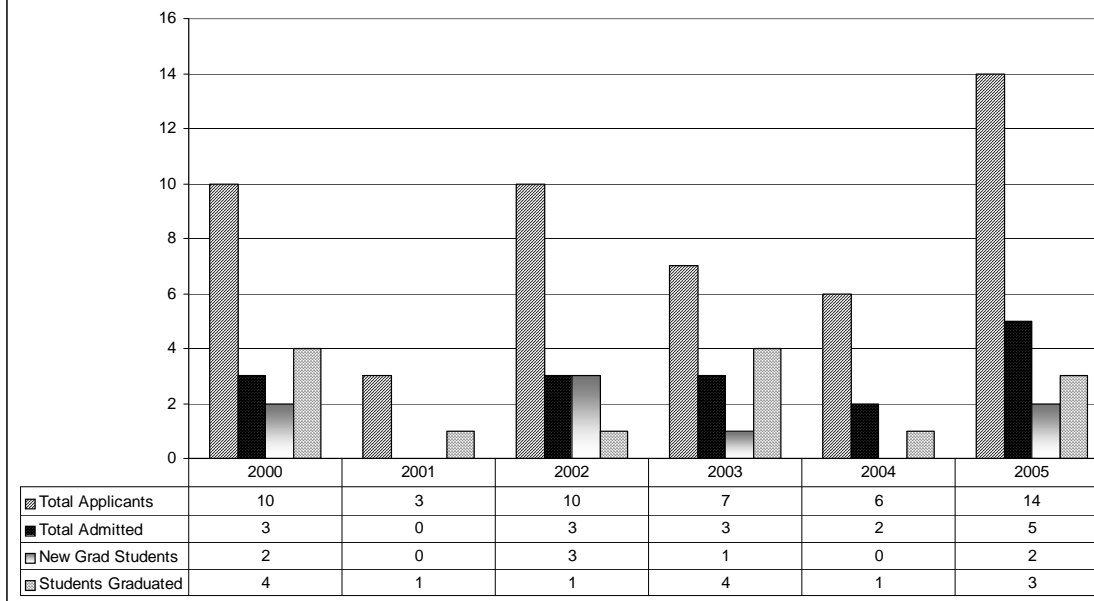
Graduate Student Summary by Year - Fall Data (BIOLOGY)

Source: Institutional Research Services



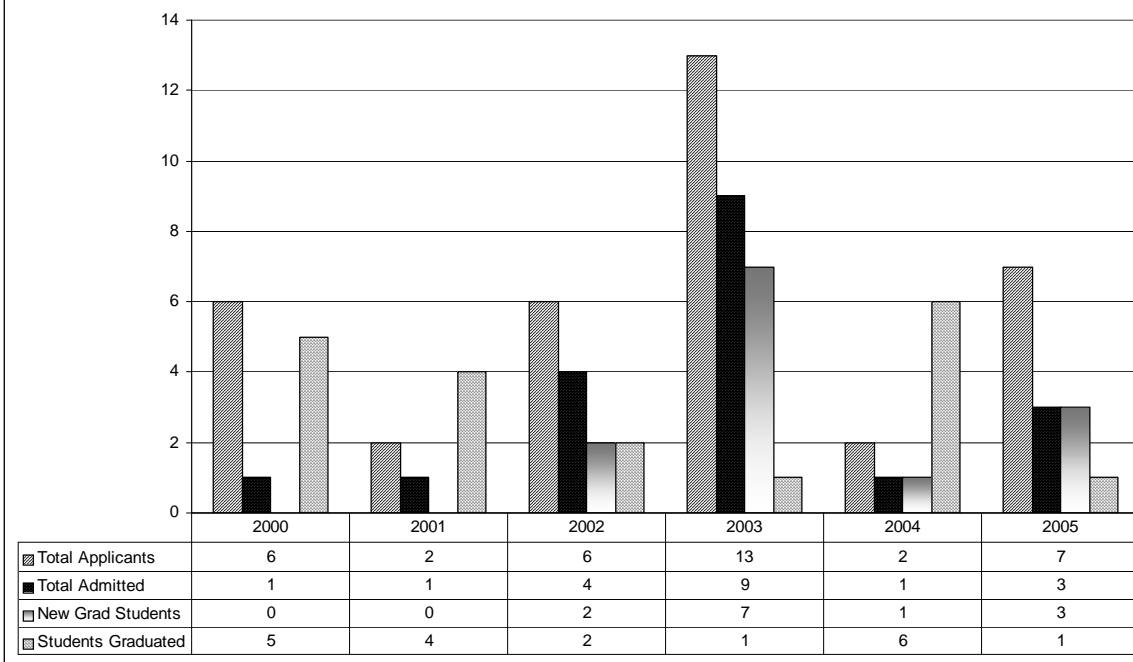
Graduate Student Summary by Year - Fall Data (MICROBIOLOGY)

Source: Institutional Research Services



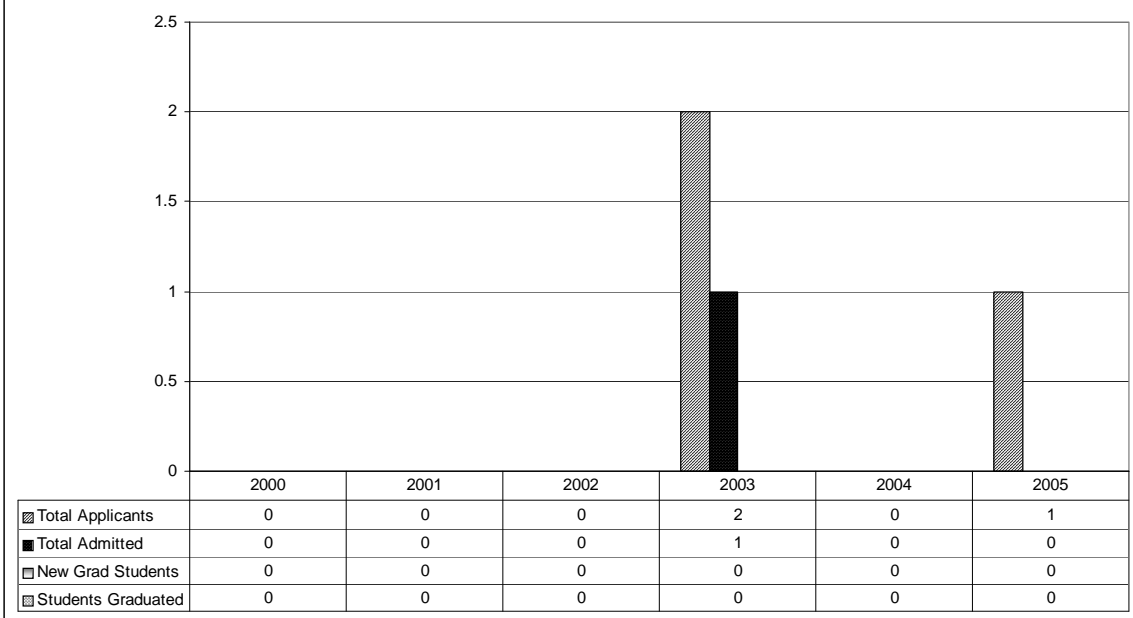
Graduate Student Summary by Year - Fall Data (ZOOLOGY)

Source: Institutional Research Services



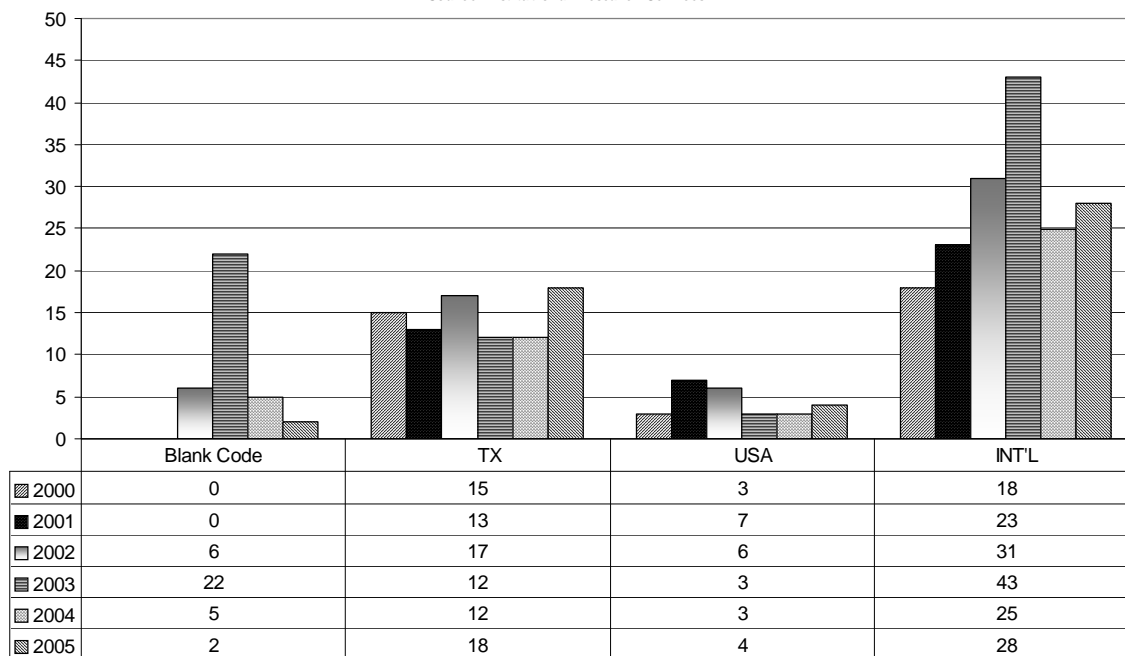
Graduate Student Summary by Year - Fall Data (BIOLOGICAL INFORMATICS)

Source: Institutional Research Services



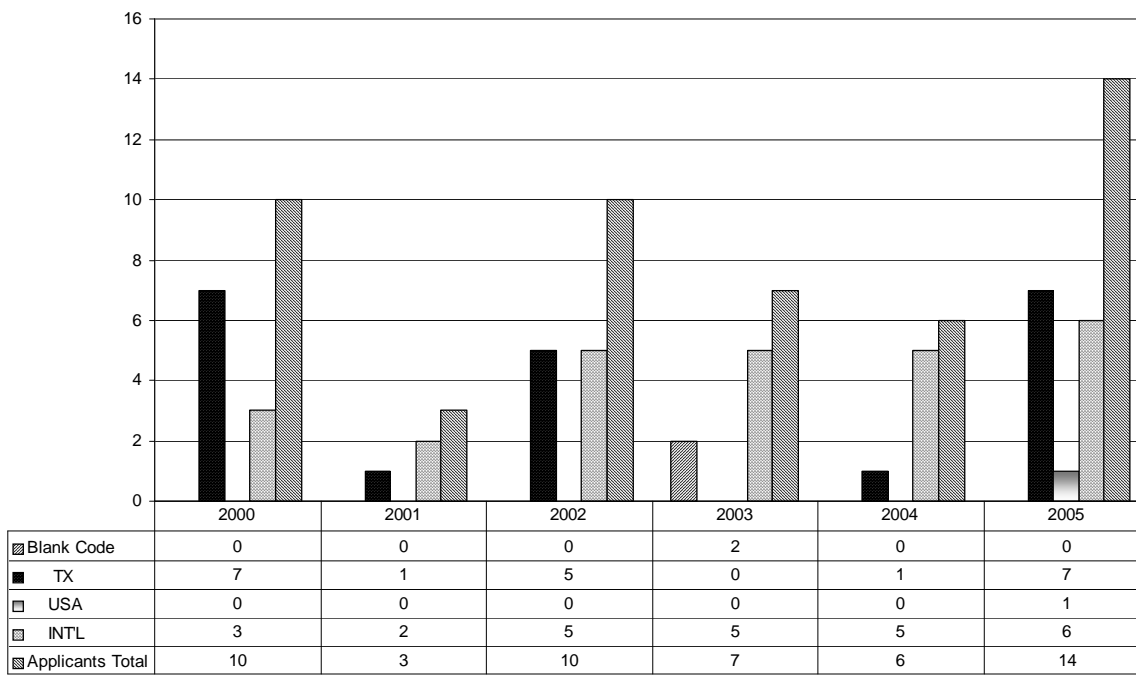
Graduate Applicants by Region - Fall/Summer Data (BIOLOGY)

Source: Institutional Research Services



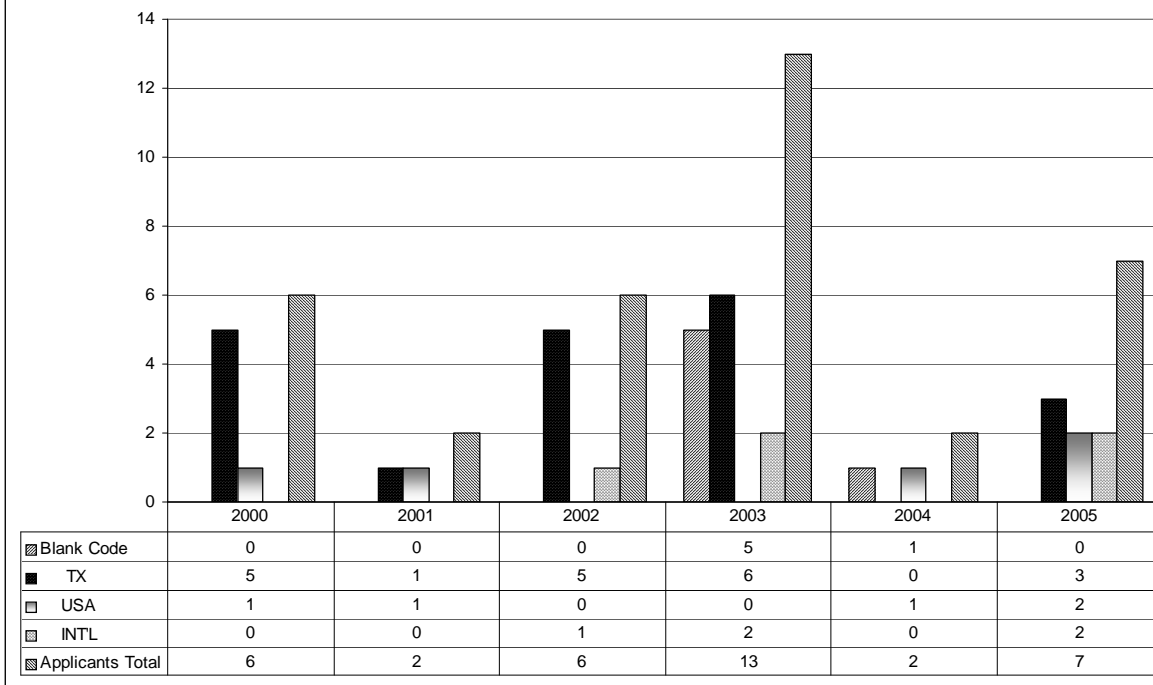
Graduate Applicants by Region - Fall/Summer Data (MICROBIOLOGY)

Source: Institutional Research Services



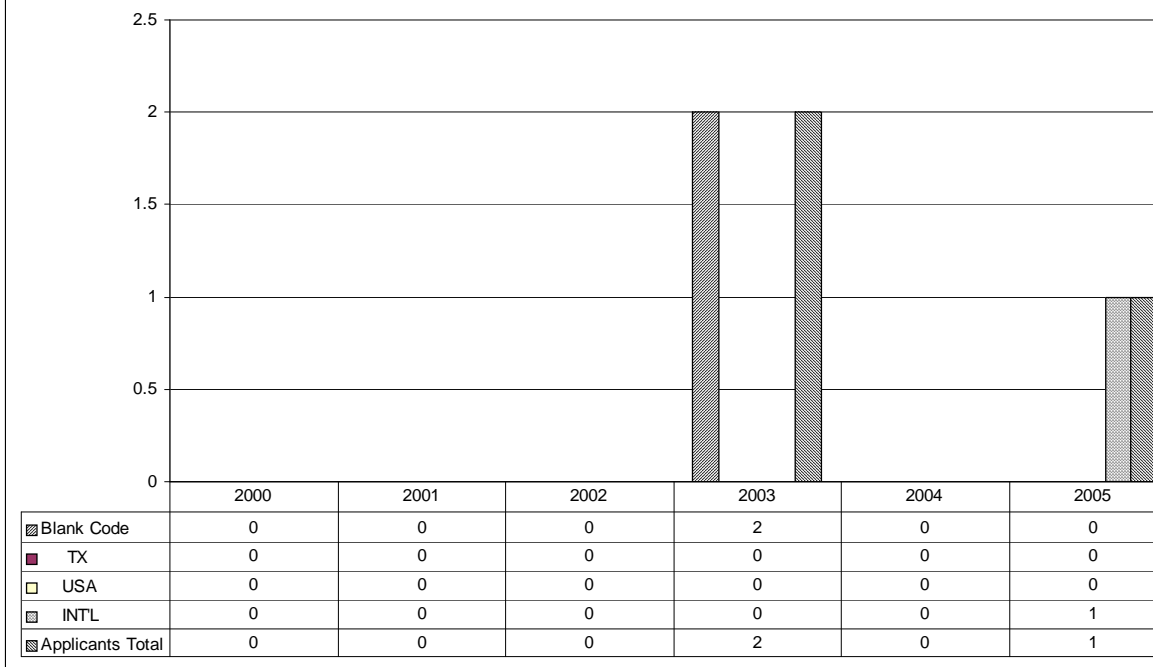
Graduate Applicants by Region - Fall/Summer Data (ZOOLOGY)

Source: Institutional Research Services



Graduate Applicants by Region - Fall/Summer Data (BIOLOGICAL INFORMATICS)

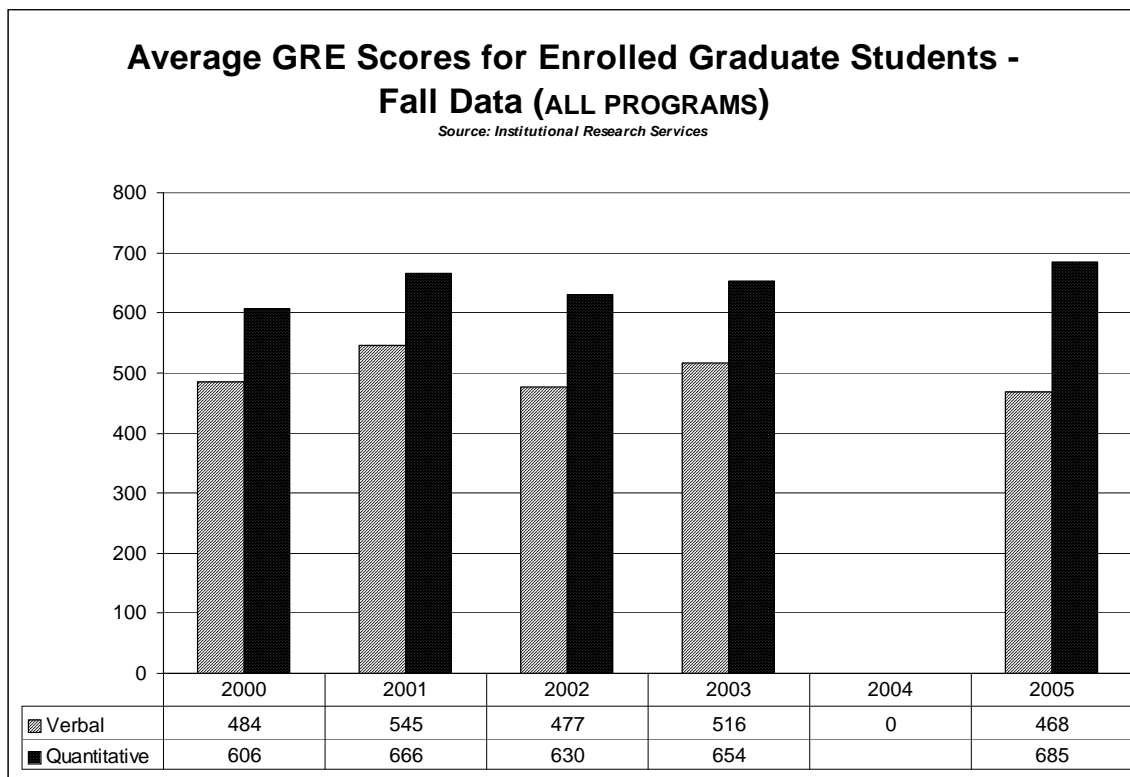
Source: Institutional Research Services



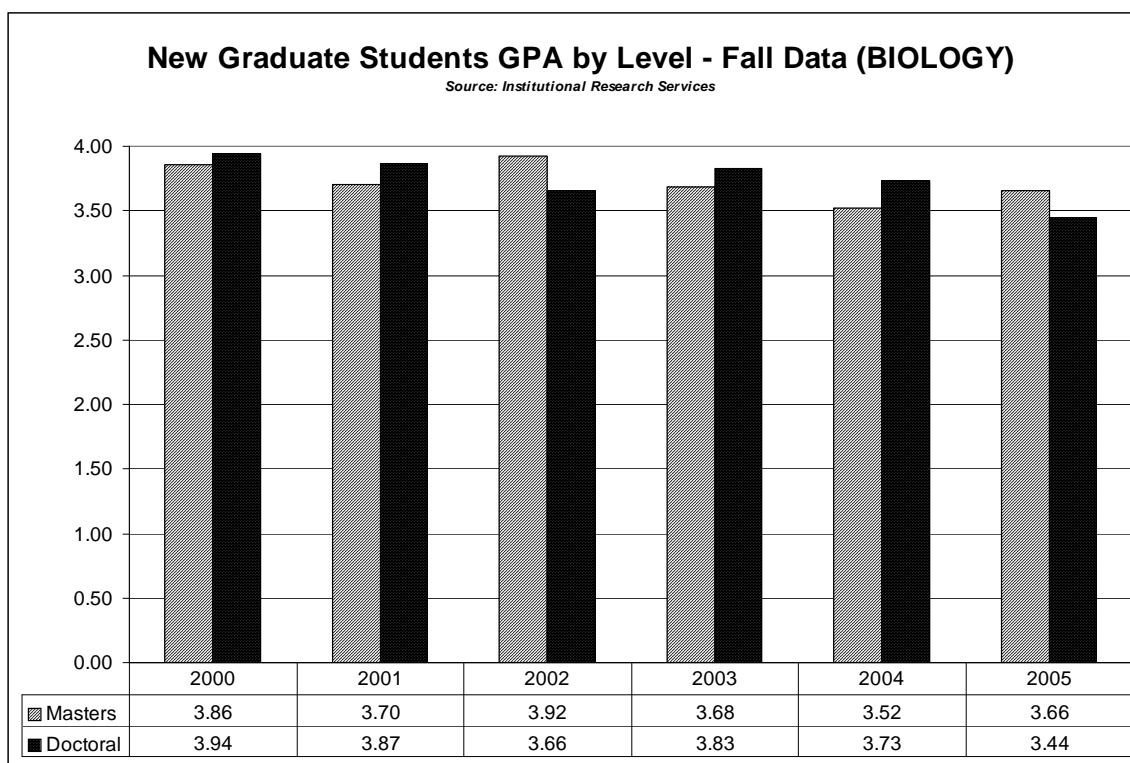
Graduate Applicants - Fall Data												
	2000		2001		2002		2003		2004		2005	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	1	0	0	0	0	0
Asian	1	2	0	0	2	1	2	0	1	0	1	5
Black	0	0	0	0	1	0	1	1	0	0	0	0
Hispanic	3	1	3	0	1	4	1	1	0	0	2	2
Non-Resident	10	11	14	11	17	19	24	24	16	13	17	16
Unknown	0	0	0	0	3	0	5	3	1	3	3	6
White	8	16	12	8	10	18	17	22	10	9	8	14
Gender Total	22	30	29	19	34	42	51	51	28	25	31	43
Total Applicants	52		48		76		102		53		74	
Admitted Graduate Students - Fall Data												
	2000		2001		2002		2003		2004		2005	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	1	1	2	0	0	0	0	2
Black	0	0	0	0	0	0	0	1	0	0	0	0
Hispanic	1	0	2	0	0	2	0	1	0	0	0	0
Non-Resident	5	2	7	7	7	7	11	8	2	4	9	13
Unknown	0	0	0	0	1	0	2	2	1	1	0	2
White	5	6	10	6	8	11	8	12	7	4	5	6
Gender Total	11	8	19	13	17	21	23	24	10	9	14	23
Total Admitted	19		32		38		47		19		37	
Enrolled New Graduate Students - Fall Data												
	2000		2001		2002		2003		2004		2005	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	1	0	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	1	0	1	0	0	2	0	1	0	0	0	0
Non-Resident	3	2	5	3	5	4	6	7	0	0	5	7
Unknown	0	0	0	0	1	0	2	2	1	1	0	1
White	4	4	5	3	3	7	4	7	5	1	0	3
Gender Total	8	6	11	6	10	13	12	17	6	2	5	11
Total Enrolled	14		17		23		29		8		16	

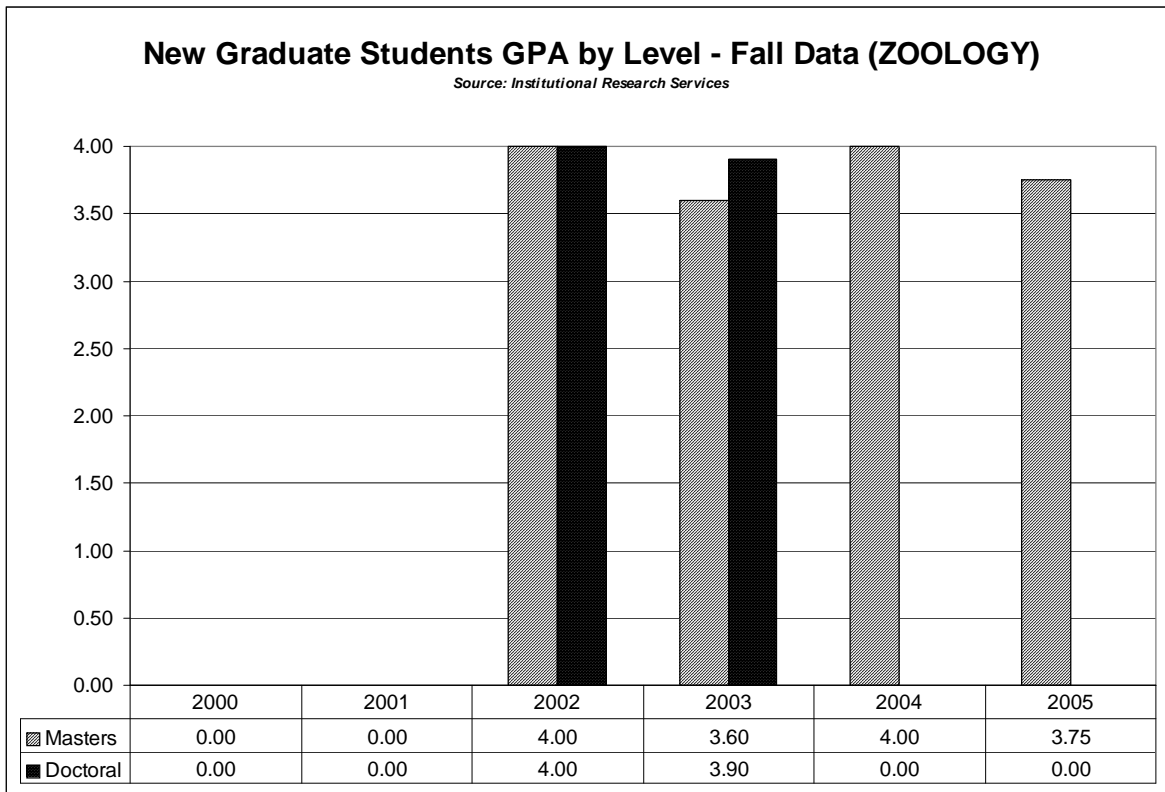
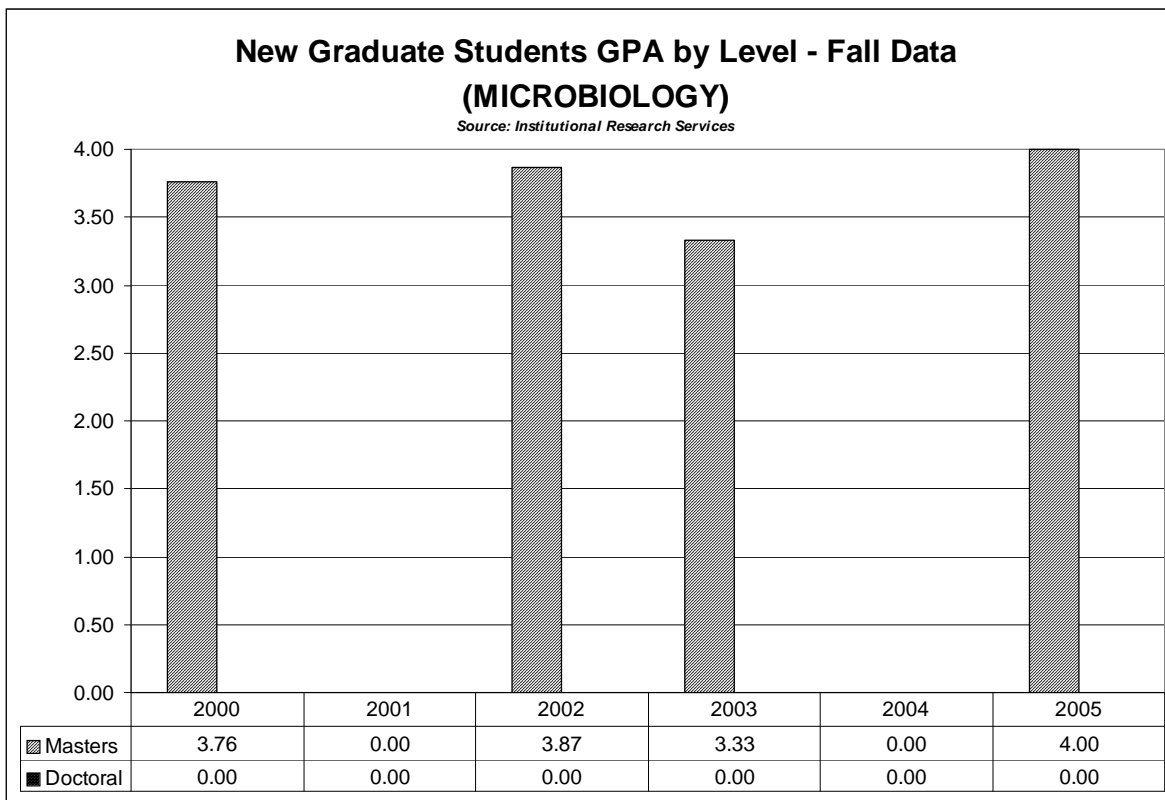
Demographics of Enrolled Graduate Students - Fall Data												
	2000		2001		2002		2003		2004		2005	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	1	0	2	0	3	0	3	0	2	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	5	1	4	1	2	3	1	4	2	4	0	5
Non-Resident	8	10	9	12	16	13	20	21	16	16	20	23
Unknown	1	1	0	1	1	0	3	4	5	4	5	4
White	27	28	23	26	30	26	25	29	23	27	22	29
Gender Total	41	40	37	40	51	42	52	58	49	100	49	61
Graduate	81		77		93		110		149		110	
Demographics of Enrolled Undergraduate Students - Fall Data												
	2000		2001		2002		2003		2004		2005	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	3	1	3	2	2	4	1	4	0	7	2	6
Asian	11	13	18	9	20	13	24	21	26	31	33	35
Black	8	8	5	6	12	3	17	5	12	7	21	12
Hispanic	24	28	37	23	45	34	45	39	48	43	61	53
Non-Resident	0	0	3	2	3	0	3	2	1	2	4	2
Unknown	1	0	1	0	1	1	1	1	2	3	2	6
White	186	161	174	180	193	183	241	237	240	274	281	271
Gender Total	233	211	241	222	276	238	332	309	329	367	404	385
Undergraduate	444		463		514		641		696		789	

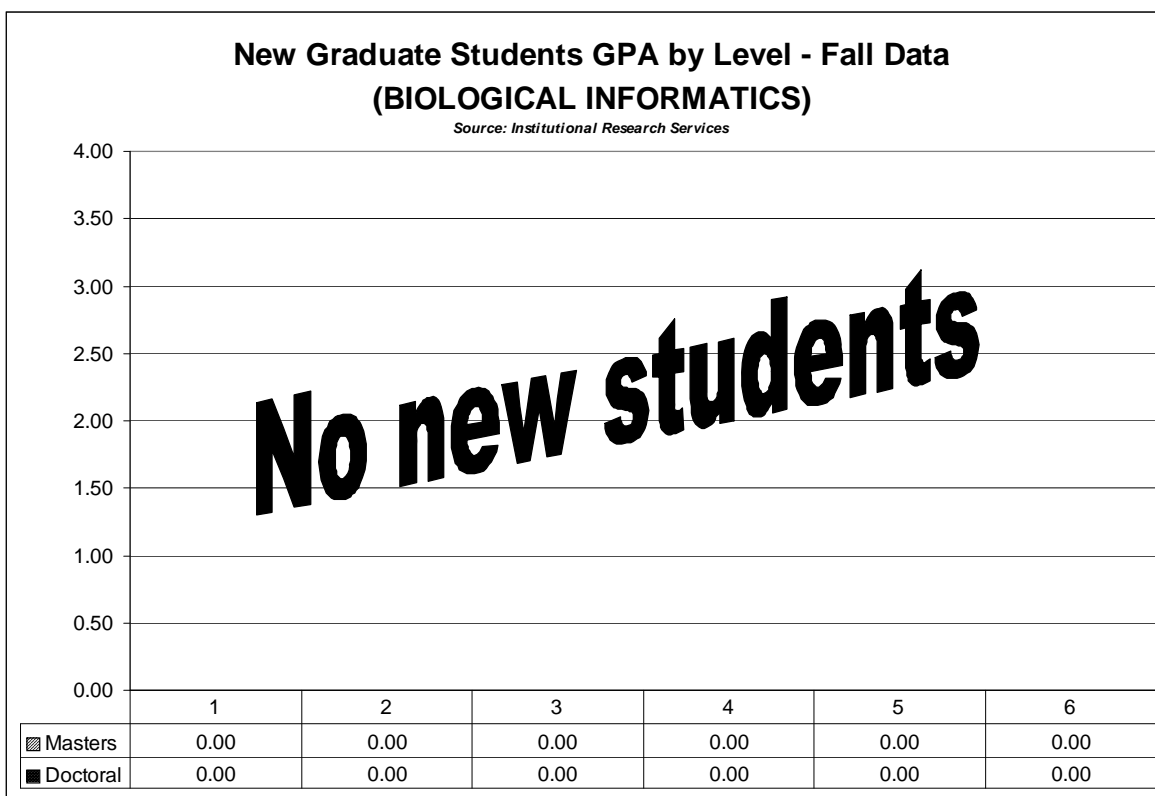
B. Test Scores (GRE, GMAT and/or TOEFL) of enrolled students



C. GPA of new students







D. Initial position and place of employment of Ph.D. graduates over the past 6 years.

Name	Initial Position	Initial Employer	Location
<u>2000-2001</u>			
Kelly Allen	Private Employment		Florida
Jennifer Dever	Assistant Professor	University of San Francisco	San Francisco, CA
Jason Dobranic	National Director of Microbiology	EMSL Analytical, Inc.	Houston, TX
Mark Grimson	Imaging Center Manager	Dept. Biological Sciences - TTU	Lubbock
Cody Edwards	Assistant Professor	Stephen F. Austin University	Nacadoches, TX
Curtis Henderson	Assistant Professor	Houston Baptist University	Houston, TX
Brenda Rodgers	Assistant Professor	West Texas A&M	Canyon, TX
Hae-Wan Yuon	Post-Doctoral Fellow	TTU-HSC	Lubbock
<u>2001-2002</u>			
Darin Carroll	Researcher	Special Pathogens Branch - CDC	Atlanta, GA
Jeffrey Wickliffe	Post-Doctoral Fellow	University Texas Medical School	Austin, TX
Frederico Hoffmann	Post-Doctoral Fellow	Department of Evolutionary Biology, Univ. of Nebraska	Lincoln, NE
Qintian Li	Senior Research Associate	Baylor College of Medicine	Houston
Jeffrey Roberts	Assistant Professor	Georgia Southern University	
Edward Sobek	Research Director	Clean Air Incorporated	Oak-Ridge, TN
Richard Stevens	Post-Doctoral Fellow	National Center For Ecological Analysis and Synthesis – UC Santa Barbara	Santa Barbara, CA
Young-Sook You	Post-Doctoral Fellow	Washington State University	St. Louis, MO
<u>2002-2003</u>			
Kee-Jong Hong	Post-Doctoral Fellow	TTU-HSC	Lubbock
Deidre Parish	High School Science Teacher	Frisco ISD	Frisco, TX
David Ray	Post-Doctoral Fellow	Louisiana State University	Baton Rouge, LA

Leahann Borth	Private Employment		Chicago, IL
<u>2003-2004</u>			
Ravi Barabote	Post-Doc	Dept. Biology-UCSD	San Diego
Chris Bloch	Post-Doctoral Teaching Fellow	Dept. Biol. Sci - TTU	Lubbock, TX
Adam Fuller	Post-Doc	Univ. Alaska, Juneau Center, School of Fisheries and Ocean Sciences	Fairbanks`
Steven Presley	Post-Doctoral Fellow	Dept Pathology, UT – Medical Branch	Houston, TX
Sun Yan	Post-Doctoral Fellow	Dept. Biology, TTU	Lubbock, TX
<u>2004-2005</u>			
Brian Amman	Researcher	Special Pathogens Branch- CDC	Atlanta, Ga
Joel Brant	Assistant Professor	Department of Biology, McMurray University	Abilene, TX
Jeremy Gilberson	Captain, USAF	Tyndale Air Force Base	Florida
Wanda Goldman	Post-Doctoral Fellow	University of Louisiana	Monroe, LA
Francisca Mendez-Harclerode	Post-Doctoral Fellow	UT-Heath Sciences Center	San Antonio, TX
Cixin He	Post-Doctoral Fellow	Dept. Biological Sciences - TTU	Lubbock. TX
Savitha Narendra	Post-Doctoral Fellow	University of Illinois at Chicago	Chicago, IL
Dorothy Tinkler	Private Employment		Lubbock, TX
Debjani Tripathy	Post-Doctoral Fellow	TTUHSC	Lubbock, TX
<u>2005-2006</u>			
James Campbell	Post-Doctoral Fellow	Clean Air labs	Oak Ridge, TN
Carl Dick	Post-Doctoral Fellow	Field Museum of Natural History	Chicago, IL
Zhiqiang Du	Post-Doctoral Fellow	MD Anderson Cancer Center	Houston, TX
Michelle Haynie	Researcher	Genetics Program, Smithsonian Institute, National Museum of Natural History	Washington, D.C.
Chris Higgins	Assistant Professor	Tarleton State College	Stephenville, TX
Fang Hu	Post-Doctoral Fellow	Dept. Cell & Molecular Biology,	East Lansing, MI

		University of Michigan	
Lee Rex McAliley	Teaching Post-Doctoral Fellow	Dept. Biol. Sci.	Lubbock, TX
Eric Paul	Assistant Professor	School of Allied Health Sciences, Southwestern Oklahoma State Univ	Weatherford, OK
Ramani Ravirala	Post-Doctoral Fellow	Beckman Center-UCLA	Los Angeles, CA

E. Type of financial support available for graduate students

The Department does not have the funds to provide research assistantships during the long semesters to our graduate students. RAs during the long semesters are provided by faculty through their funded research or from start-up for new faculty to recruit graduate students. The number of RAs in the Department varies across years depending upon funding success. Graduate students have also been supported by scholarships and fellowships from various governmental agencies such as the EPA, through the Fulbright Program, or from their home country. The number of students supported in this manner varies each year. Our graduate students are encouraged to apply for fellowships and dissertation improvement grants when possible. The Department works to ensure that all students have support during the summer and uses some of the Graduate Tuition funds to provide departmental RAs for one summer session. During the summer, graduate students are also supported as TAs for our summer classes. We have been supporting up to twenty-four graduate students as TAs during the summer. The majority of our graduate students are supported through faculty RAs during the summer.

F. Number of students who have received national and university fellowships, scholarships and other awards

AWARD	00/01	01/02	02/03	03/04	04/05	05/06
ARCS Fellowships	0	0	0	\$5,000	\$10,000	\$5,000
Cash Family	\$15,000	\$18,000	\$15,000	\$30,000	\$30,000	\$24,000
EPA GRO Fellowship	0	0	0	0	0	\$32,000
Hazlewood	\$3,000	\$3,000	\$0	\$0	\$3,000	\$3,000
Health and Social Services	\$4,000	\$4,000	\$0	\$0	\$0	\$0
J Knox Jones Scholarships	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500
Junction	\$0	\$500	\$0	\$0	\$1,000	\$0
SBC Chancellors Fellowship	\$3,000	0	0	\$3,000	\$3,000	\$3,000
Summer Dept. RAs	\$20,708	\$4,555	\$72,633	\$76,133	\$43,000	\$63,612
Summer Dissertation (Graduate School)	\$8,000	\$2,000	\$6,000	\$8,000	\$10,000	\$16,275
Federal Work Study	0	0	0	\$30,150	\$33,408	\$40,183
Non-monitory research awards	0	1	24	15	28	NA
Total Funds Received	\$56,208	\$34,055	\$96,133	\$154,783	\$135,908	\$189,570

G. Graduate Student Publications and Creative Activities – Number of publications and other activities by Master and Doctoral students in the department.

Publication:	Referred		Non-Referred		Presentations Oral and Poster		Other activities	
Year	Thesis	Diss.	Thesis	Diss.	Thesis	Diss.	Thesis	Diss.
2006	12	32			23	41		
2005	7	19			17	51		
2004	7	17			25	44		
2003	7	29			14	34		
2002	8	20			13	33		
2001	6	23			11	22		
2000	10	9			17	22		

H. Programs for mentoring and professional preparation of graduate students.

To help new graduate students adjust to the responsibilities of graduate school, particularly for incoming M.S. students, the Department requires that all incoming graduate students take BIOL 6202, "Graduate Teaching and Learning". This course is offered each Fall semester and covers such topics as: 1) developing effective reference searches, 2) preparing an oral presentation using Power Point, and 3) ensuring lab and research lab safety (see Appendix H for course syllabus). For new Teaching Assistants the Department has developed a Special Topics class that focuses on helping our graduate students develop effective teaching skills. Topics presented and discussed in the calls include: 1) What makes a class outstanding and memorable, 2) What is an effective teacher, 3) What makes an effective mentor. Additional topics discussed in this course can be found in the Appendix H. In the Spring 2005 semester, Associate Professor, Dr. Lauren Gollahon, named as a National Academies Education Mentor in the Life Sciences in 2004 provided a Mentoring Seminar to graduate students, Post-Doctoral Teaching Fellows and faculty. The seminar utilized information produced by the Howard Hughes Medical Institute New Generation Program for Scientific Teaching. The course provided discussion on topics such as "Learning to Communicate", and "Resolving Challenges and Issues" (see Appendix H for complete list of topics). Each of these efforts underscores the Department's commitment to ensuring the success of our graduate students in all aspects of their graduate program.

I. Department efforts to retain students and graduation rates

Departmental efforts to retain graduate students and ensure high graduation rates begin when graduate students are first admitted into the Department. We do not accept students into our graduate programs unless they have previously talked with a faculty member and have begun to establish the necessary mentor-student relationship. By requiring that all students must have a faculty member willing to accept them into their lab before admittance can occur, we avoid situations where students drift from lab to lab and may eventually drop-out of the program. We work to ensure that all students have the opportunity to be successful from the first day they walk into our department.

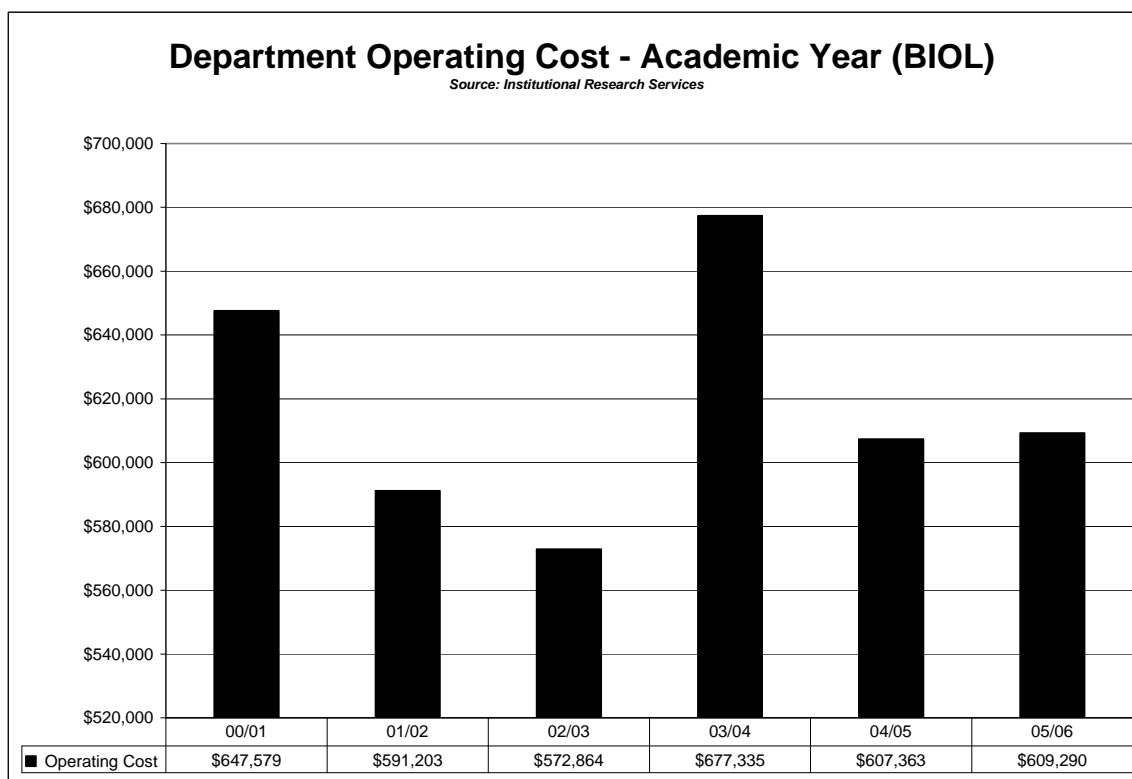
In the past several years we have increased efforts to bring potential students to TTU to visit the campus through the Graduate School's Recruitment Fund. This visit helps to alleviate any fears or misconceptions by students of the campus and Lubbock and promotes the strengths of our Department.

Once in the Graduate Program, the Graduate Advisor in consultation with the Chair evaluates all graduate students on a yearly basis to ensure that adequate progress is being made in their program and provide a forum for addressing any concerns. If interactions between student and mentor become an issue, the Graduate Affairs Committee will act as a mediator between the student and mentor to help resolve any issue. Rarely does the situation require their intervention.

The Chair of the Department provides financial support for graduate student travel through the Graduate Tuition funds as much as possible. These funds encourage our students to present their research at national and regional meetings and help foster an attitude that the Department is committed to their education and success.

V. Department

A. Department operating expenses



Department Operating Costs as a Fraction of Employees

	00/01	01/02	02/03	03/04	04/05	05/06
Dept Operating Cost	\$647,579	\$591,203	\$572,864	\$677,335	\$607,363	\$609,290
Faculty & Staff	43	41	48	44	44	49
Dept Op Cost /FS	\$15,067	\$14,420	\$11,935	\$15,394	\$13,804	\$12,434

B. Summary of Proposals (submitted)

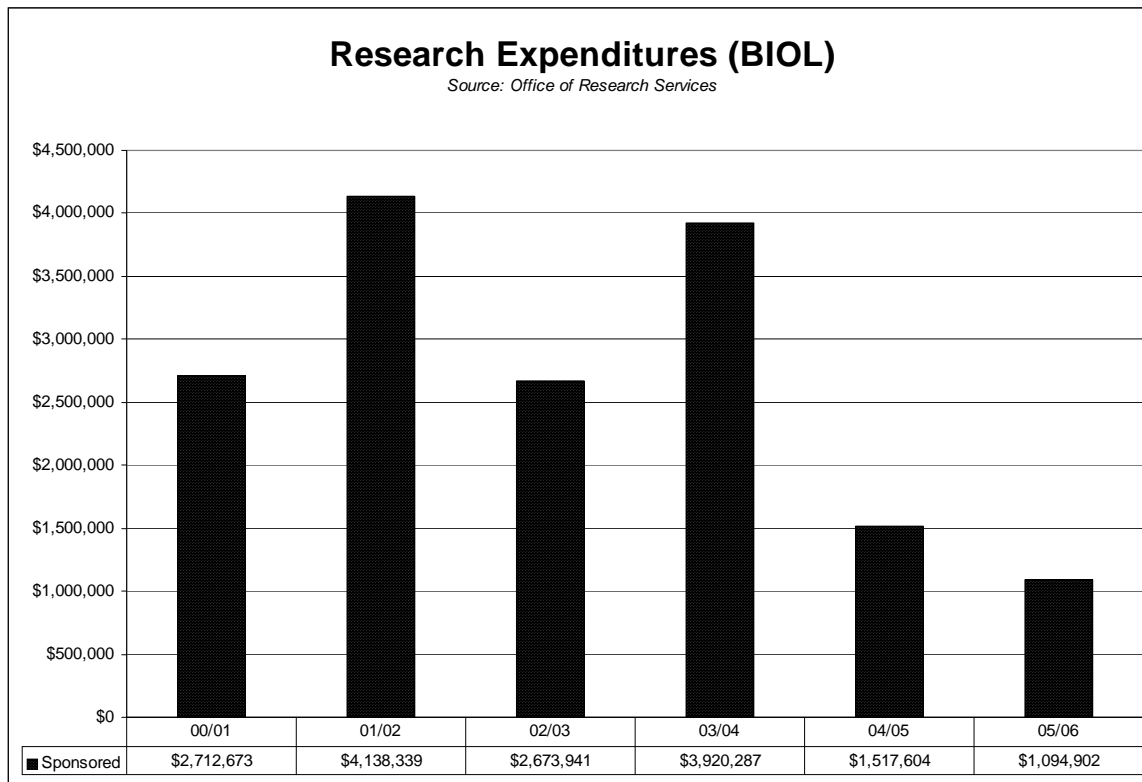
Summary of Number of Proposals Written and Accepted

	Foundation		State		Federal		Others		Successfully funded	
	D	M	D	M	D	M	D	M	D	M
2005	5	0	5	0	44	10	3	0	16	3
2004	2	0	1	0	46	4	1	0	9	4
2003	7	0	7	0	32	10	0	0	12	16
2002	8	0	2	0	28	5	2	0	6	3
2001	6	0	10	0	31	4	2	0	8	5
2000	5	2	0	3	15	15	2	0	0	3
	D = Disciplinary (internal) M = Multidisciplinary (external)									

C. External Research expenditures

SUMMARY OF FACULTY AWARDS BY HOME DEPARTMENT*Source: Office of Research Services*

<i>Year</i>	<i>Number of Awards</i>	<i>Facilities & Administrative</i>	<i>Award Amount</i>
00/01	32.18	\$386,110	\$2,712,673
01/02	36.05	\$633,126	\$4,138,339
02/03	38.83	\$373,615	\$2,673,941
03/04	41.06	\$609,932	\$3,920,287
04/05	31.23	\$177,328	\$1,517,604
05/06	21.87	\$127,653	\$1,094,902
<i>Totals:</i>	201.22	\$2,307,764	\$16,057,746



Comparison of Research Expenditures	00/01	01/02	02/03	03/04	04/05	05/06
Louisiana State University	\$14.1 mil	\$25.6 mil	\$28.7 mil	\$33.3 mil	\$33.5 mil	\$39.0 mil
Oklahoma State University	\$1,057K	\$457K	\$771K	\$714K	\$642K	
University of Missouri-Columbia		\$4,683K	\$5322K	\$5458K	\$5,292K	\$4,762K
University of North Texas	\$2,402K	\$2,000K	\$2,478K	\$1,989K	\$2,964K	
Texas Tech	\$2,713K	\$4,138K	\$2,674K	\$3,920K	\$1,518K	\$1,095K

D. Internal funding

Source of Internal Funds (TTU)

Source: Institutional Research Services

	00/01	01/02	02/03	03/04	04/05	05/06
Research Enhancement	\$2,668	\$5,336	\$5,500	\$6,180	0	0
Research Incentive	\$36,648	\$18,153	\$39,776	\$20,984	\$86,987	\$44,765
Line Items	0	0	0	0	0	0
Interdisciplinary Seed Grants	0	\$17,000	0	\$17,000	\$38,000	0
New Faculty Start-ups	0	\$102,217	\$368,718	\$208,164	\$37,104	\$185,920
Matching from VPRGSTT	0	0	0	\$120,000	0	0
Special needs and opportunities	\$283,507	\$35,000	0	0	\$5,000	0
Research Promotion*	0	0	0	\$1,200	\$1,200	\$3,000
Graduate School Fellowships	\$30,000	\$27,500	\$21,000	\$38,000	\$44,000	\$43,275
HEAF	\$96,982	\$51,006	\$8,693	\$60,893	\$86,923	\$141,440
VPR Competitive Grant Program	0	0	0	0	0	\$303,000
TOTALS:	\$449,805	\$256,212	\$443,957	\$364,421	\$299,214	\$721,400

1. Research promotion represents funds provided for travel by the VPR to faculty.
2. In 2002-2001 the funds designated as Special Needs and Opportunities represented Texas Excellence Funds provided to Support the Development of a research program entitled "Center for Zoonoses and Emerging Diseases" by Dr. Robert Bradley and Dr. Carl Phillips. For 2001-2002, Special Needs funds were Texas Excellence funds provided to Dr. Houck for the Forensic Science Initiative.
3. Funds received from the VPR Competitive Grants Program supported: "Integrated Plant Stress Research Program". Dr. Randy Allen – PI.

E. Scholarships and endowments

The Department of Biological Sciences currently only has one endowment and Scholarship available for selected graduate students. The **J Knox Jones Jr. Memorial Endowed Scholarship** was established to support graduate students in Biological Sciences who aspire to be an organismal level mammalogist whose research interests include mammalian systematics and natural history of mammals in the broadest context. Awards are given to either PhD or MS students. The scholarship provides on average \$2,500 for up to three students. The scholarship can be renewed for up to a total of four years (PhD) or two years (MS). Recipients may be employed up to halftime as a Research or Teaching Assistant.

In September of 2006 a second endowed scholarship, the **Michelle Knapp Memorial Scholarship** was established by her family in Biological Sciences in memory of Michelle who passed away in late summer. This Scholarship will be available beginning in September 2007 and will be used to support graduate students in Mammalogy and who are undertaking field efforts as part of their PhD research.

F. Departmental resources for research and teaching (i.e. classroom space, lab facilities)

Type of Space	Number of Rooms	Total Assignable Square Feet
Classrooms	8	9,665
Teaching Labs	16	19,451
Research Labs	86	30,744
Graduate Offices	4	1,711
Faculty Offices	26	4,888
Common Space	17	4,204
Meeting Rooms	4	1,278
Dept/Administrative	5	2,274
TTU-HHMI	2	1,245
STORAGE:	3	1,930
LIBRARY:	0	0
Animal Care Facility	1	1,943
Herbarium	1	1,829
Plant Growth Chambers	1	1,636
Greenhouse	16	10,110
TOTAL SQUARE FEET		92,908

G. HEAF expenditures

	Labs	Classroom	Other (identify)	TOTAL
2005	\$28,383	0	0	\$28,383
2004	\$23,937	0	0	\$23,937
2003	\$11,868	0	\$32,000*	\$43,868
2002	\$7,674	0	0	\$7,674
2001	\$31,623	0	0	\$31,623
2000	\$2,750	\$723	0	\$3,473

For 2003, two field vehicles were purchased for the Department.

VI. Conclusion –

During early December of each year the faculty in Biological Sciences gathers for supper and a mini-retreat to discuss important long-term issues confronting our Department. For the 2006 mini-retreat the topic was our Graduate Program specifically focusing our discussions on the following topics: 1) Research funding in the Department, 2) Enhancement of graduate recruitment, 3) Increase support for PhD graduate students, and 4) Development of graduate student endowments. This meeting allowed our faculty to discuss the ongoing Graduate Program Review and to formulate a course of action for the next several years to address our deficiencies and to ensure we maintain our strengths.

Research Funding

Research funding has declined in the Department despite increased number of proposals written by the faculty. Part of the decline in funding has been the loss of several senior faculty. As the Department hires junior faculty to fill these positions we anticipate that research funding will begin to increase. Our faculty are spending greater amounts of time trying to secure dwindling research dollars at the State and National levels. In that graduate education is directly related to research funding, the University should provide a bridging mechanism that would allow for funding of small proposals to maintain current graduate efforts while the faculty continue to secure external funding. While funding levels remain low, faculty publishing efforts continue to increase. Each year we have more faculty involved in proposal and manuscript reviews and participate on review panels. These are all signs that our faculty are actively engaged in research and that their contributions have a national or international significance.

Request: The University should develop a bridge fund to support research efforts between grants.

Enhancement of graduate recruitment

The faculty are concerned that numbers of domestic students applying to our Department has decreased while the total number of applications to our graduate program continues to increase. The Fall 2006 semester saw the largest graduate cohort in the history of our department, 115 graduate students. The increase in graduate applications and admissions is due to an increase in foreign students. We will continue to expand and update our website as a mechanism to attract quality domestic students. However, successful recruitment of domestic students also hinges upon being able to provide a competitive salary and support package for incoming graduate students. Discussions among faculty have indicated that TTU's graduate student compensation package is not competitive with comparable institutions in surrounding states. Part of the support package that should be addressed for Biological Sciences concerns the current state of our graduate offices. Our building was designed to accommodate up to 45 graduate students. Our office space for graduate students does limit our efforts to recruit graduate students. Currently we have one upgraded graduate office space available for our graduate students. Most of graduate students are placed in corners in the lab or occupy former lab space. Not only has the lack of adequate space hindered recruitment efforts, we are at our limit of office space that can be used for graduate students.

Request: Upgrade current departmental graduate office suites and develop additional graduate offices as can be carved out of existing laboratory space.

Increase support for PhD graduate students

A potential recruiting tool that can be used to foster domestic applications for the PhD is to provide support to all P.D. graduate students that have been admitted to candidacy. Providing a Departmental RA in this manner will: 1) provide a valuable recruitment opportunity, and 2) increase the number of PhD students, thus having the potential to increase formula funding, and 3) contribute to increased publication efforts and increased Dissertation Improvement Awards in that these students can show strong departmental support. It is estimated that these RAs would be provided for a maximum of three years. In most instances they would probably be provided to a student for two years.

Request: Provide University funds to support Departmental RAs for PhD students after admission to candidacy.

Development of graduate student endowments.

The faculty acknowledged during our mini-retreat that the Department is severely lacking in endowments to support graduate education. To address this need the Department, through the departmental Advisory Committee will constitute an ad hoc committee to meet with the Development Officer in A&S to develop a strategy and an action plan over the next couple of years to raise a \$5Million endowment that will directly support graduate education in the Department. This endowment will be used to fund graduate student research and travel. Having a graduate endowment will be a critical recruitment tool.

Request: Assistance through A&S Development Office to pursue our Graduate Endowment Program

One of the major strengths of our Department is our ability to provide a diverse series of courses and research opportunities to graduate students. Our research diversity not only encompasses the major areas of biology but is expressed through efforts at multiple levels of biological complexity. In turn, similar questions are asked by various researchers in the department using very different taxonomic groups, which adds another level of diversity and opportunity to graduate students who want to explore the breadth and depth of our collective expertise. We will continue to build upon our research strengths while evaluating the success of our students in each of graduate degree programs. We measure success of our graduate program at the PhD level by the ability of our completed PhDs to secure Post-Doctoral Fellowships, research positions in industry, and government labs and faculty positions in academic institutions around the country and in other countries. We also want our PhDs to publish their research in a timely manner and collectively work to see that our students understand the need to publish as they complete their graduate education.

In response to the SAC Accreditation efforts over the past several years, our Zoology Program Assessment Committee will recommended to the faculty that the name of the Zoology Program at the undergraduate and graduate levels be changed, tentatively to Ecology and

Evolutionary Biology. The name change better captures the research emphasis of faculty in this area of the department and should provide increased visibility for graduate recruiting.

VII. Appendices – should include, but not be limited to, the following:

A. Strategic Plan	p. 62
B. Graduate Course Offerings	p. 82
C. Recruiting Materials	p. 93
D. Graduate Student Handbook	p. 107
E. Graduate Student Association(s)	p. 148
F. Graduate Faculty Information	p. 149
G Teaching Post-Doctoral Fellow Information	p. 283
H. Syllabi from Graduate Courses That Focus on Teaching, Learning, and Mentoring	p. 298

APPENDIX A

Strategic Plan

The Updated Strategic Plan for Biological Sciences, the 2005 Annual Assessment Report and Strategic Plan Update, and the Program Level Assessment Plans that were developed for the recent SACS Accreditation effort are included in Appendix A.

APPENDIX B

Graduate Course Offerings

GRADUATE COURSES IN BIOLOGY

Course	Title	Hours	Description	Qualifier
BIOL 5301	Advanced Genetics	(3:3:0)	Genetic and molecular analyses of inheritance. Course is offered to graduate students with limited knowledge in genetics.	Prerequisite: 8 hours of biology, 8 hours of chemistry, one semester of organic chemistry, or consent of instructor.
BIOL 5302	Advanced Cell Biology	(3:3:0)	Structure and function of cells with introduction to modern techniques for cell study. Course is offered to graduate students with no formal training in cell biology.	Prerequisite: 8 hours of biology, 8 hours of chemistry, plus at least one semester of organic chemistry; or consent of instructor.
BIOL 5303	Advanced Experimental Cell Biology	(3:1:6)	A project-oriented introduction to modern research techniques used to study cellular and molecular processes in eukaryotic cells.	Prerequisite: Consent of instructor and prior or concurrent enrollment in BIOL 5302.
BIOL 5305	Organic Evolution for Advanced Students	(3:3:0)	The concept of evolution, its mode and tempo of operation, and its relationship to organic diversity in its broadest sense are emphasized.	Prerequisite: BIOL 3416 or equivalent course in genetics.
BIOL 5306	Advanced Cancer Biology	(3:3:0)	This course presents a comprehensive overview covering the history of cancer biology to the most recent findings in the field. Molecular and cellular biology as well as clinical topics will be covered.	Prerequisite: BIOL 5320; ZOOL 5304 is recommended.
BIOL 5309	Advanced Ecology	(3:3:0)	A detailed examination of the structural and functional relationships underlying the organization of populations, communities, and ecosystems.	Prerequisite: Background in organismal biology or undergraduate ecology.

Course	Title	Hours	Description	Qualifier
BIOL 5310	Advanced Community Ecology	(3:3:0).	An investigation of both theoretical and experimental approaches to understanding the composition, diversity, and structure of plant, animal, and microbial communities.	Prerequisite: A course in ecology or consent of instructor.
BIOL 5311	Ecology for Teachers	(3:3:0)	An investigation into ecology for individuals, populations, communities, and ecosystems for practicing teachers.	Prerequisite: Admission to the Multidisciplinary Science Master's Program or consent of instructor.
BIOL 5312	Cell and Molecular Biology for Teachers	(3:3:0)	An investigation into cellular and molecular biology intended for practicing teachers.	Prerequisite: Admission to the Multidisciplinary Science Master's Program or consent of instructor.
BIOL 5320	Advanced Molecular Biology	(3:3:0)	Coverage includes a rigorous examination of molecular processes in cellular functioning. Experimental approaches used to investigate molecular events in eukaryotes, prokaryotes, and viruses will be emphasized.	
BIOL 5330	Advanced Landscape Ecology	(3:3:0)	In-depth examination of how we quantify patterns and effects of spatial heterogeneity on organisms and ecological processes. Discussion section is required.	Prerequisite: Consent of instructor.
BIOL 5405	Systems Ecology	(4:3:3)	Theory & techniques of system analysis and mathematical modeling applied to ecological	Prerequisite: MATH 1352 or 1552, BIOL 3303 and 3307, or

			problems.	consent of instructor.
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Course	Title	Hours	Description	Qualifier
BIOL 5407	Advanced Population Biology	(4:3:3)	Introduction to the genetics or ecology of populations including a survey of topical, historic, and current literature with emphasis on experimental evaluation of testable hypotheses.	Prerequisite: BIOL 3301, 3303, or equivalent.
BIOL 6000	Master's Thesis	(V1-6)		
BIOL 6100	Advanced Topics in Biology	(1)	Special areas of current interest not commonly included in other courses. Content normally different each time offered. May be repeated for additional credit.	Prerequisite: Consent of instructor.
BIOL 6101	Seminar	(1:1:0)	Various topics in modern biology. May be repeated for credit.	
BIOL 6202	Preparation for Graduate Learning and Teaching in Biology	(2:2:0)	Preparation of graduate students for the roles of scholar, researcher, and teaching assistant. Emphasizes literature research, preparation of visual aids, innovative teaching strategies, and problem-solving methods.	Prerequisite: Acceptance in a graduate degree program in the Department of Biological Sciences or consent of instructor.
BIOL 6301	Advanced Topics in Biology	(3)	Special areas of current interest not commonly included in other courses. Content normally different each time offered. May be repeated for additional credit.	Prerequisite: Consent of instructor.
BIOL 6304	Principles and Practice of Phylogenetic Systematics	(3:3:0)	Character, analysis, phylogeny reconstruction, consensus procedures, and phylogenetic classification, using morphologic and molecular data.	Prerequisite: BIOL 4305 or 5305; ZOOL 6302 recommended.

Course	Title	Hours	Description	Qualifier
BIOL 6309	Advanced Topics in Quantitative Biology	(3:3:0)	Studies of current applications of mathematics, statistics, and computing to the biological sciences. Content normally different each time offered. May be repeated for additional credit.	Prerequisite: Consent of instructor.
BIOL 6315	Regulation of Gene Expression	(3:3:0)	An advanced, in-depth analysis of current research on mechanisms that regulate eukaryotic gene expression at transcriptional and post-transcriptional levels.	Prerequisite: BIOL 5320 or 4320.
BIOL 6350	Advanced Physiological Plant Ecology	(3:3:0)	Investigation of the physiological processes of plants that contribute to understanding the ecological distribution and evolutionary success of plants in their physical environment.	
BIOL 6392	Marine Biology	(3:3:0)	The study of marine organisms and their environments.	Prerequisite: Undergraduate degree in biology or consent of instructor.
BIOL 6408	Research Techniques in Electron Microscopy	(4:1:6)	Introduction to operation of electron microscopes emphasizing independent work with organic or inorganic sample preparation and analysis for transmission or scanning electron microscopes.	Prerequisite: BA or BS in a scientific field.

Course	Title	Hours	Description	Qualifier
BIOL 6502	Biometry	(5:4:3)	The application of statistical methods to data from various fields of biological research. Special emphasis on conceptual bases of univariate and multivariate tests from both parametric and nonparametric perspectives.	Prerequisite: College algebra.
BIOL 7000	Research	(V1-12)		
BIOL 8000	Doctor's Dissertation	(V1-12)		

GRADUATE COURSES IN BOTANY

Course	Title	Hours	Description	Qualifier
BOT 5401	Advanced Plant Physiology	(4:3:3)	A general plant physiology course for graduate students with no previous training in plant physiology. Emphasis is placed on recent experimental advances in the field.	Prerequisite: Organic chemistry or biochemistry and general botany or biology.
BOT 6302	Advanced Field Botany	(3:1:6)	A field-trip and herbarium-based course that will provide students with sophistication in the identification and classification of plants in natural areas of West Texas and adjacent regions.	Prerequisite: BOT 3404, 5404, or consent of instructor.
BOT 6304	Advanced Plant Molecular Biology	(3:3:0)	Molecular mechanisms regulating plant metabolism and plant development. Intensive reading on current literature is required.	Prerequisite: Introductory biology, genetics, cell biology, or consent of instructor.

GRADUATE COURSES IN MICROBIOLOGY

Course	Title	Hours	Description	Qualifier
MBIO 5301	Advanced General Microbiology	(3:2:3)	Morphology, physiology, and classification of microorganisms. Readings or original research in one area of microbiology is required.	Prerequisite or parallel: Organic chemistry. May not be taken for credit by students who have taken MBIO 3401.
MBIO 5303	Microbe-Plant Interactions	(3:3:0)	Biochemical, molecular, genetic, and ecological basis of pathogenic and symbiotic microbe-plant interactions.	Prerequisite: MBIO 3400 or 3401 or BIOL 3420 or BOT 3401.
MBIO 5401	Current Perspectives in Microbial Ecology	(4:3:3)	Course will examine specific theories and concepts concerning ecology of the soil microflora and microfauna, and the roles of these organisms in ecosystem functioning.	Prerequisite: A course in microbiology, mycology, ecology, or related area, or consent of instructor. May not be taken for credit by students who have taken MBIO 4401.
MBIO 5403	Immunobiology	(4:3:4)	Theories of infection and resistance, the production and demonstration of antibodies, the action of antigens, and diagnostic tests. Readings or research in one area of immunology is required.	Prerequisite: Consent of instructor. May not be taken for credit by students who have taken MBIO 4402.
MBIO 5404	Pathogenic Microbiology	(4:3:4)	A detailed study of pathogenic microorganisms.	Prerequisite: MBIO 3401 or 5301. May not be taken for credit by students who have received credit for MBIO 4404.
MBIO 5408	Microbial Genetics	(4:3:3)	Topics include current techniques of genetic analysis, molecular biology, molecular genetics, nucleic acid metabolism, and gene regulation in microorganisms, with emphasis on bacteria and bacteriophages.	Prerequisite: MBIO 5301 or consent of instructor. May not be taken for credit by students who have taken MBIO 4406.

Course	Title	Hours	Description	Qualifier
MBIO 6000	Master's Thesis	(V1-6)		
MBIO 6302	Advanced Bacterial Physiology	(3:3:0)	Advanced study of bacterial physiology.	Prerequisite: MBIO 3401 or 5301; 12 semester hours of chemistry, including biochemistry or concurrent registration; consent of instructor.
MBIO 6306	General Virology	(3:2:3)	An introduction to the biology of animal, bacterial, and plant viruses.	Prerequisite: Consent of instructor.

GRADUATE COURSES IN ZOOLOGY

Course	Title	Hours	Description	Qualifier
ZOOL 5304	Comparative Endocrinology	(3:3:0)	Hormones as chemical coordinators of bodily functions.	Prerequisite: ZOOL 2405, 3301, BIOL 1404.
ZOOL 5306	Advanced Mammalogy	(3:2:3)	Studies of recent advances in mammalogy.	For students who have not taken ZOOL 4306.
ZOOL 5308	Advanced Ornithology	(3:2:3)	Selected topics including avian systematics, migration, physiology, ecology, and comparative behavior.	Prerequisite: Consent of instructor.
ZOOL 5312	Advanced Animal Behavior	(3:3:0)	Comparative animal behavior with emphasis on genetics and neurophysiology and how they relate to survival.	
ZOOL 5401	Animal Histology for Advanced Students	(4:2:6)	Microscopic anatomy of the normal cells, tissues, and organ systems of the human and other mammals are studied.	Prerequisite: ZOOL 2405 or a course in chordate anatomy or consent of instructor. Open to graduate students who have not taken ZOOL 3401 or equivalent.
ZOOL 5406	Advanced Invertebrate Zoology	(4:3:3)	This course develops a comprehension of the structure, function, ecology, and evolution of invertebrate animals, with an emphasis on the relationships among taxa and the diversity within taxa. Written reports on special projects required.	Prerequisite: Consent of instructor.
ZOOL 5407	Vertebrate Zoology for Advanced Students	(4:3:3)	Diversity, evolutionary relationships, adaptations of vertebrates. Field trips required.	Open to students who have not taken ZOOL 4307.

Course	Title	Hours	Description	Qualifier
ZOOL 5409	Comparative Physiology for Advanced Students	(4:3:3)	A comparison of physiological functions including homeostatic mechanisms, muscle, nerve, in the major phyla. Laboratory reports written in a journal format are required.	Prerequisite: ZOOL 2405 or 3406; BIOL 3420; CHEM 3305, 3306 recommended.
ZOOL 5421	Ecological Entomology	(4:3:3)	An advanced exploration of the behavior, ecology, and evolution of insects.	Prerequisite: Consent of instructor.
ZOOL 6000	Master's Thesis	(V1-6)		
ZOOL 6302	Principles of Systematic Zoology for Advanced Students	(3:3:0)	Theory and practice of naming, describing, and classifying organisms. Speciation, phylogeny reconstruction, and other current topics in evolutionary biology emphasized.	Prerequisite: BIOL 3301 or equivalent; BIOL 4305 or 5305 recommended.
ZOOL 6303	Seminar in Mammalogy for Advanced Students	(3:3:0)	A historical perspective of mammalogy as a science including advances in ideology, character systems, and data analysis. Current topics and controversies will be addressed.	Prerequisite: Consent of instructor.
ZOOL 6320	Comparative Neuroanatomy	(3:2:3)	A comparative study of the vertebrate central nervous system, with emphasis on the structure, development, and function of the mammalian brain.	Prerequisite: Consent of instructor.
ZOOL 6321	Advanced Herpetology	(3:2:3)	The course will be concerned with the biology of amphibians and reptiles. Stress will be placed on classification, evolution, ecology, and anatomy of the various groups.	Prerequisite: Consent of instructor.

APPENDIX C

Recruiting Materials

The main source for recruiting information sent out to perspective graduate students is through our website (www.biol.ttu.edu). The following section contains a printout of the information found on our website concerning our graduate program, contact information, and how to apply to the program.

APPENDIX D

Graduate Student Handbook

The Graduate Student Handbook for Biological Sciences is found on our website (www.biol.ttu.edu). The handbook is divided into four components: 1) University Policy for Graduate Students activities, 2) Information for the Doctoral Program in Biology or Zoology and a checklist of requirements and tentative dates for completion, 3) Information on the Thesis Master's Program and associated checklist of requirements and tentative dates for completion, and 4) Information on requirements for the Non-Thesis Master's Degree Program. Information found on the website is included in this section. In addition, we have included information from the website that provides TIPS to prospective graduate students that highlights information all graduate students should know contemplating entering graduate program in Biology. This information was shared by a colleague, Dr. Kurt Reinhart.

APPENDIX E

Graduate Student Association(s)

There are two active graduate student associations within Biological Sciences: the "Texas Tech University Association of Biologists (TTUAB) and the student chapter of the American Association of Microbiology (ASM). Each of the student organizations acts to: 1) promote camaraderie and scientific interactions among graduate students, 2) support graduate student attendance at local, regional and national meetings, 3) promote graduate student scholarship, and 4) act as a service organization for the Department.

TTUAB raises funds through dues and the sale of lab manuals, and lab kits for the Biology, Botany and Zoology courses in Biological Sciences. ASM raises funds through dues and through the sale of lab manuals for the lab classes in Microbiology. Funds generated by TTUAB are primarily used to support graduate travel to meetings. These funds also support a "Graduate Student Research Forum where monetary prizes are awarded to presentations as determined by faculty judges. In addition, TTUAB sponsors a Mini-Grant Competition in the spring semester to help fund graduate student research. Funds raised by ASM are used to send students to meetings and to help defray page charges for publication efforts. For both organizations all members are required to contribute several hours of service to the organization and to the Department. Both organizations are responsible for coordinating the socials that are held before our weekly seminars.

Membership in TTUAB is open to any graduate student in good standing in the Department of Biological Sciences. Active membership for 2006-2007 is 50. Membership in Tech ASM is open to any graduate or undergraduate student in the Department of Biological Sciences of Texas Tech University. Members must be enrolled in the University and in good standing both with the University and the Department of Biological Sciences. Active memberships for 2006-2007 is 20.

APPENDIX F

Graduate Faculty Information

APPENDIX G

Teaching Post-Doctoral Fellow Information

The Department of Biological Sciences initiated a Teaching Post-Doctoral Fellows in the Fall Semester of 2003 to train new Ph. Ds in Biology in effective teaching skills. Through our Teaching Post-Doc Program we have recruited five individuals from across the country over the last three year to interact with our faculty in developing research proposals, to increase the diversity of interactions with our graduate students, and to provide greater flexibility in our undergraduate teaching schedules. Beginning in 2007 the TTU-HHMI Program will be supporting one Teaching Post-Doctoral Fellow in this program. Our goal is to establish a nationally recognized program in training new Ph. Ds in teaching and to expand our network of research collaborators once the fellows have moved to permanent position. In addition, these individuals can also function to help recruit graduate students into our program. Information on the current Teaching Fellows is included in this report.

APPENDIX H

Syllabi from Graduate Courses that Focus on Teaching, Learning and Mentoring