TEXAS TECH UNIVERSITY
Graduate School™

Graduate Program Review

2010-2011

Department of
Computer Science
William Marcy, Chair

Whitacre College of Engineering
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December 2010

PROGRAM REVIEW OUTLINE
Department of Computer Science

I. Program Overview – A one to two-page summary of department's vision and goals.

II. Graduate Curricula and Degree Programs

A. 1. Scope of programs within the department
   2. Expected learning outcomes and outcomes assessment. Include typical degree plan/program of study.

B. Number and types of degrees awarded
   - 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
   - Semester Credit Hours – Academic Year (chart)
   - SCH compared to Budget - Academic Year (chart)

D. Number of majors in the department
   - Enrollment by Level – Fall Data (chart)
   - Comparison of Enrollment – Fall Data (Peer info table)
   - Program Enrollment (table)

E. Course offerings and their enrollments over the past six years (enrollment trends by course)
   - Course Enrollments by Academic Year (table)

F. Courses cross listed

III. Faculty

A. Number, rank and demographics of the faculty (tenured and tenure track), GPTI's and TA's
   - 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)
   - Committee service (table)

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)
   - Graduate Applicants by Region – Fall/Summer Data (chart)
   - Graduate Applicants - Fall Data (table)
   - Admitted Graduate Students - Fall Data (table)
   - Enrolled New Graduate Students - Fall Data (table)
   - Demographics of Enrolled Graduate Students - Fall Data (table)
   - Demographics of Enrolled Undergraduate Students - Fall Data (table)

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. Time to Degree in Years (chart)

E. Provide a breakdown of how many enrolled graduate students are RA's. TA's or GPTI's (chart)

F. Initial position and place of employment of graduates over the past 6 years (table)

G. Type of financial support available for graduate students.

H. Number of students who have received national and university fellowships, scholarships and other awards - fellowships awarded (table)

J. Percentage (%) of full time students receiving financial support

K. Graduate Student Publications and Creative Activities (table) – number of discipline-related refereed papers/publication, juried creative/performance accomplishments, book chapters, books, and external presentations per year per student. (Note: this may overlap with faculty publications.)

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

M. Department efforts to retain students and graduation rates

N. Percentage of Full Time students per semester – Fall data

V. Department

A. Department operating expenses
   - Department Operating Cost - Academic Year (chart)
   - Department Operating Cost as a Fraction of Employees - (table)

B. Summary of Proposals (Submitted)
   - 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)

H. External Program Accreditation – Name of body and date of last program accreditation review including description of body and accreditation specifics.

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
B. Graduate Course Offerings
C. Graduate Student Handbook
D. Graduate Student Association(s)
E. Graduate Faculty Information

I. Program Overview – A one to two-page summary of department's vision and goals.

The current vision of the Computer Science Department is stated as follows:

The Department of Computer Science aspires to be recognized as one of the leading computer science graduate programs in the state of Texas and the United States.

The Texas Tech University Computer Science Department will:

- *Advance the state-of-the-art in computer science and software engineering through the achievement of fundamental advances, and testing these advances through their application to hard problems,*
- *Instruct undergraduate and graduate students in the state-of-the-art scientific and engineering methods pertinent to computer science and software engineering in order to lead students to a point of understanding where they remain ethical, and creative problem solvers,*
- *Be recognized as one of the leading public educational and research computer science departments by attracting the best students, faculty and staff;*
- *Prepare students to be leaders and decision makers, articulate and principled, innovative and confident, and able to think critically with sound reasoning ability;*
- *Be a research-intensive department where faculty discovery enhances learning and prepares students to compete in a knowledge-based society; and*
- *Be engaged in local, regional, and state social and economic development for the benefit of both the public and private sectors.*

In the spirit of this vision, the Department strives to accomplish its mission through its research, educational and service activities and therefore, remains a very dynamic department. The current composition of its faculty has provided definitive directions in research and teaching activities in its graduate programs. The Department has been successful in seeking academic identity and recognition in the academic/research community through its top quality research activity as evidenced by a constant federal grant support and by an increase in the number of publications in well-regarded international forums.

The Department offers several degree programs both singly and in cooperation with other departments. At the undergraduate level, the Department offers a BS in computer science and cooperates with the Electrical and Computer Engineering Department on the EECS dual degree and Computer Engineering degree programs. In addition, the Department cooperates with the Math Department on the dual MACS degree and the Chemical Engineering Department on the ChECS dual degree. At the graduate level, the Department offers an MS in computer science and an MS in software engineering as well as a PhD in computer science. To encourage undergraduates to enter the graduate program, the Department also offers combined BS/MS degrees in computer science and software engineering.

The Department was created as a program in 1988, with only four faculty members and a Director. By 1989 there were eight faculty members and by 1991 the first Ph.D. was awarded. By 1993 the program became an academic department. Since 1993, the size of the faculty has increased to 20 faculty members. Pursuant of its vision and goals of excellence, the Department

has been successful in attracting top quality faculty. The current graduate student population consists 86 Masters, 35 Ph.D. and 14 MSSE students, for a total of 135 graduate students as of the fall of 2009. These numbers show after a long period of declining enrollments, a modest increase in enrollments is now occurring. This trend follows a national enrollment pattern not just throughout the United States but also worldwide.

II. Graduate Curricula and Degree Programs

A. 1. Scope of programs within the department

The Department of Computer Science offers a master of science in computer science, a master of science in software engineering, a certificate in software engineering, and a Ph.D. in computer science. The Department also offers combined BS/MS degrees in computer science and in software engineering. One Masters program is a traditional computer science program that leads to MSCS degree where students must take a set of core computer science courses in systems and theory. A second Master program leads to a Software Engineering (MSSE) degree. The MSSE program is intended to give the graduate a firm foundation in the definition, development and maintenance of complex software systems using traditional engineering process methods. The Certificate in Software Engineering targets working professionals and non-CS graduate students interested in the professional development of software. The MSSE and the SE Certificate are both offered through the College of Engineering distance program.

Both master's programs have both thesis and non-thesis plans. In the non-thesis plan, the student may choose from a project which entails the development of software, a report where the student conducts a small research project, or a comprehensive exam over the four core subject areas and two elective areas.

Ph.D. students are required to demonstrate general knowledge in several areas of computer science and proficiency in a single research area. Certification of research proficiency is based on a record of accomplished research substantiated by published articles, technical reports, and papers presented at meetings, workshops, and conferences.

A. 2. Expected Learning Outcomes and Outcomes Assessment

Expected Learning Outcomes of the PhD Program

A list of expected learning outcomes is given below:

1. Graduates are expected to communicate effectively orally and in writing.
2. Engage in life-long learning and self-critique.
3. Function in multi-disciplinary, and culturally diverse environment with cross-functional teams.
4. Integrate ethical considerations and advancement of public well being into professional actions and decisions.
5. Have a solid knowledge of current advances in their research area and apply it leading to innovative discovery.

Outcomes Assessment of the PhD Program

Outcomes are assessed at the program and the course level through the following approaches:

- *Admission process and standards:* The admission process to the graduate program uses both qualitative and quantitative criteria. The quantitative criterion includes a CS rank determined in terms of GPA, GRE and TOEFL results. The rank gives an indication of where the student stands in regard to the overall graduate population. The process helps to guarantee a high quality graduate population in CS. For each fiscal year statistical

metrics based on the quantitative part of the admission process can be used to assess the overall quality of the current graduate population. An admission committee meets regularly to assess a fair admission process according to the graduate school established procedures.

- *Qualifying exam:* Doctoral students are required to pass a qualifying exam, prepared by members of the student's dissertation committee, before being considered for candidacy.
- *Dissertation Defense:* Doctoral students must successfully defend their dissertation to their committee in presence of a graduate school representative.
- *Research publication requirement:* Doctoral students must have published or have at least their articles accepted for presentation in conferences/workshops or for publication in journal forums. In some rare case, if research cannot be published due to some non-disclosure agreements, quality and substantial achievements must be established using other means.
- *Official degree plan:* Doctoral students must submit an official degree plan approved by the department's Graduate Advisor to the Graduate School.
- *Student Performance evaluation*: Instructors evaluate student performance periodically to gauge their progress through tests, homework, programming, and design projects. The syllabus for each course contains specific outcomes and assessments for the given course.
- *Instructor performance evaluation:* The students in each long semester course evaluate performance of faculty members in the classroom. Results of these evaluations are submitted to the University and delivered to the individual faculty members to use as a reference for future improvements.
- *Course expected learning outcomes*: An indirect measure of performance has been established by which students evaluate the expected outcomes of each course they take. Their responses are weighted and mapped to the appropriated program outcomes for assessment.
- *External Advisory Board:* The department's external advisory board provides feedback to enhance the quality of the program and assess current expectations from the industrial and business community.
- *Graduate Curriculum Committee:* The Graduate Curriculum Committee gathers suggestions from faculty for new courses and catalogue changes.
- *Graduate Committee:* The Graduate Committee collects and reviews changes to the program and provides recommendations to the graduate faculty for approval.

Expected Learning Outcomes of the MSCS/MSSE Programs

A list of expected learning outcomes for the MSCS is given below:

1. Communicate effectively orally and in writing.
2. Engage in life-long learning and self-critique.
3. Have good computer science skills including modeling, mathematical, and experimental analysis, and programming.
4. Function independently on self directed projects or research where appropriate.
5. Graduates are expected to have a reasonably broad knowledge of computer science.

A list of expected learning outcomes for the MSSE is given below:

1. Communicate effectively orally and in writing.
2. Engage in life-long learning and self-critique.
3. Have core software engineering knowledge and skills for professional software development.
4. Graduates are expected to have a reasonably broad knowledge for professional software development.
5. Function independently on self-directed projects or research where appropriate.

Outcomes are assessed at the program and the course level through the following approaches:

- *Admission process and standards:* As stated for the PhD program.
- *Official degree plan:* Masters students must submit an official degree plan approved by the department's Graduate Advisor to the Graduate School.
- *Thesis quality*: Each student thesis committee supervises that standard components are identified in each Master thesis. Such standards must include organization, bibliographic search, detailed problem statement and scope of solutions proposed, experiment design, and results and analysis. A thesis proposal is required as a starting point to ensure that research work evolves into an acceptable thesis report.
- *Comprehensive Exam:* This exam is offered regularly for non-thesis option MS students. The success rate of this exam needs to be recorded and reported, which is not a current practice.
- *Project reports:* This is a new option recently introduced. Standards need to be established and adopted to measure an acceptable level of quality.
- *Graduation rate:* This metric will indicate any correlation between our admission standards to the MS program and the number of graduates.
- *Student Performance evaluation*: As stated for the PhD program.
- *Instructor performance evaluation:* As stated for the PhD program.
- *Course expected learning outcomes:* As stated for the PhD program.
- *Employment rate:* The CS newsletter is an instrument that has been used to track alumni. It can be useful to track graduate employment, and current positions in industry, or other occupations.
- *Publication rate*: Several publications have been generated out of Master thesis work. The number of publications per year generated by Master students can be used as a metric of the quality and acceptance of the work generated at the Masters level.
- *Advisory Board:* As stated for the PhD program.
- *Graduate Curriculum Committee:* As stated for the PhD program.
- *Graduate Committee:* As stated for the PhD program.

Assessment of program learning outcomes needs further work. The lists of assessments provided for the masters programs and the PhD program are only some of the viable ways to assess progress of the corresponding programs outcomes. Some of them have been implemented and some others are in the process of integration into the assessment process. One example is the evaluation of performance of students in the classroom; the CS faculty is currently engaged integrating evaluations of students as a direct assessment into the program evaluation process.

Degree Plans

PhD Degree

For the Ph.D. degree, students are required to demonstrate general knowledge in several areas of computer science and proficiency in a single research area. Certification of research proficiency will be based on a record of accomplished research, published articles, technical reports, and papers presented at meetings, workshops, and conferences constitute a record of research proficiency. These requirements are additional to Graduate School regulations.

The expected course requirements for PhD students include 12 hours of CS 8000 dissertation, 60 semester hours of graduate work (equivalent to 20 three-hour graduate-level courses). A PhD student becomes a degree candidate after a PhD dissertation proposal has been presented and approved and a research-oriented qualifier exam has been successfully presented.

MSCS degree

The MSCS program has both thesis and non-thesis plans. Both plans require taking the following courses:

- Two theory core courses chosen from (C S 5381, 5383, 5384)
- Two system core courses chosen from (C S 5352, 5375, 5368)
- CS electives chosen from any CS graduate courses excluding leveling, research (non-thesis exam option), thesis, and dissertation courses.

The thesis plan requires students:

- To take at least six hours of C S 6000 (Master's Thesis),
- To complete and defend a master's thesis successfully, and
- Take four CS electives (three hours of C S 7000 may be substituted for one CS elective course).

In the non-thesis plan, the student may choose from the project/report or exam options. The project option is application-oriented and includes the development of a software system. In the report option, a theoretical investigation is performed, such as proof of concept, algorithm development and/or analysis, a study to gather and analyze data, and logic proofs. Both are documented by a report.

The exam option requires passing a written comprehensive examination.

- In the project/report option, the student is required to:
    - Take seven CS electives (three hours of C S 7000 may be substituted for one CS elective course),
    - Take at least 3 hours of C S 6001 (Project) or C S 6002 (Report),
    - Complete for the project a software system with report, or must complete for the report an investigation with report, and
    - Complete an oral examination at the completion of the project or report.
- In the exam option, the student must:
    - Take eight CS electives,
    - Not take C S 6000 or C S 7000 for credit towards his/her degree, and
    - Pass a written comprehensive examination near the end of her/his studies.

MSSE degree

The MSSE program has both thesis and non-thesis plans. Both plans require taking the following courses:

- SE Core Courses
  - CS 5363 Software Project Management
  - CS 5373 Software Modeling and Architecture
  - CS 5374 Software Verification and Validation
- CS electives
  - Chosen from any CS graduate courses excluding leveling, research (non-thesis exam option), thesis, and dissertation courses
- SE Electives
  - CS 5332 Special Topics in Software Engineering
  - CS 5358 Software Studio I (to be renamed Capstone Project)
  - CS 5369 Web-Based Software Systems
  - CS 5380 Fault Tolerant Computer Systems
  - IE 5320 Systems Theory

In the thesis plan, the student is required to:

- To take at least six hours of C S 6000 (Master's Thesis),
- To complete and defend a master's thesis successfully,
- Take three electives from SE Electives, and
- Take two electives from CS Electives (three hours of C S 7000 may be substituted for one CS elective course).

In the non-thesis plan, the student may choose from the project/report or exam options. The project option is application-oriented and includes the development of a software system. In the report option, a theoretical investigation is performed, such as proof of concept, algorithm development and/or analysis, a study to gather and analyze data, and logic proofs. Both are documented by a report.

The exam option requires passing a written comprehensive examination and

- Must take five electives from SE Electives,
- In the project/report option, the student must
  - Take three CS electives (three hours of C S 7000 may be substituted for one CS elective course),
  - Take at least 3 hours of C S 6001 (Project) or C S 6002 (Report),
  - Complete for the project a software system with report, or must complete for the report an investigation with report, and
  - Complete an oral examination at the completion of the project or report.
- In the exam option, the student must:
  - Take four CS electives,
  - Not take C S 6000 or C S 7000 for credit towards his/her degree, and
  - Must pass a written comprehensive examination near the end of her/his studies.

The Combined BS/MS Degrees in Computer Science and Software Engineering

The Combined BS/MS Degrees in Computer Science and in Software Engineering begin graduate courses at the senior level and include one more year of graduate study if the student chooses the thesis option. For example, for the MSCS, students may take the four MSCS core courses and then complete their coursework and thesis the following year. In addition, the

undergraduate computer science program may include 6 hours of elective CS 4000 Individual Studies in Computer Science where the student may begin their thesis research.

The Certificate in Software Engineering Degree Plan

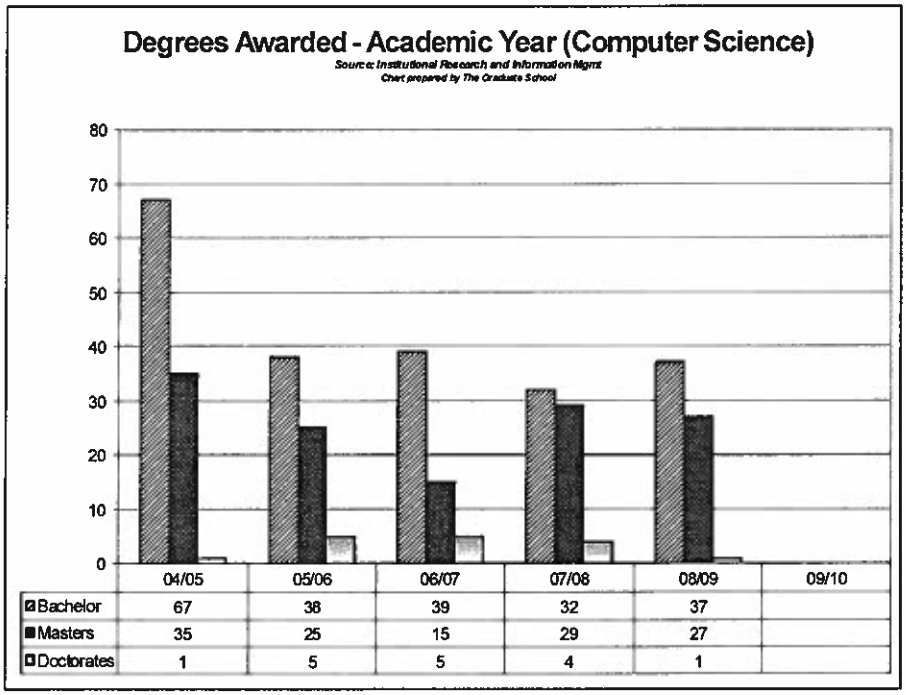
In addition to any leveling requirements, coursework for the certificate requires 12 hours consisting of:

- CS 5373 Software Modeling and Architecture
- CS 5374 Software Verification and Validation

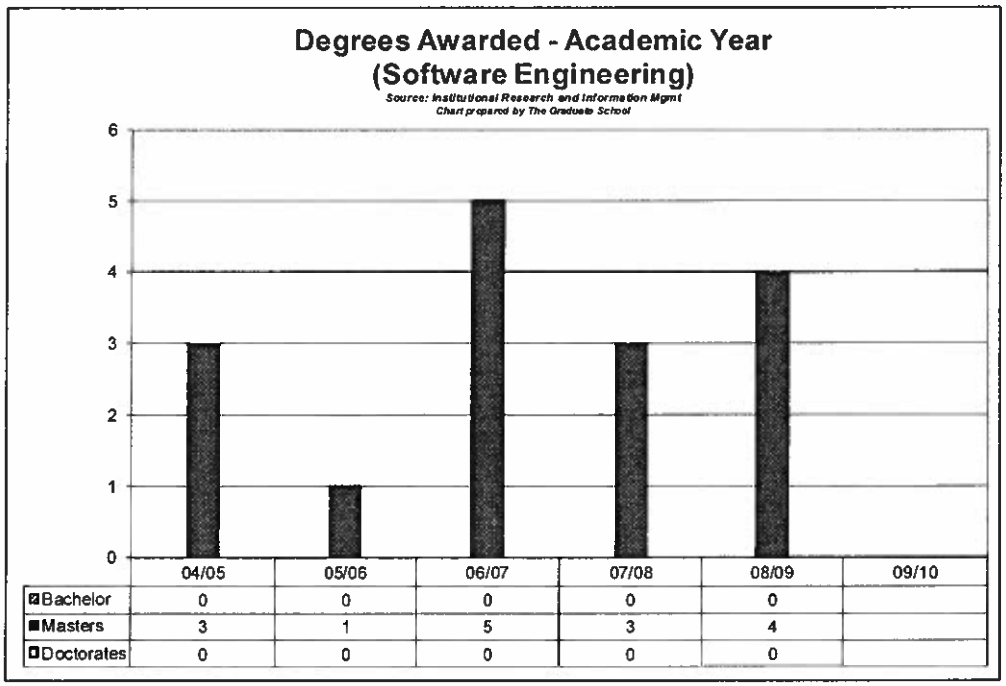
And two elective courses from the following SE electives:

- CS 5332 Special Topics in Software Engineering
- CS 5358 Software Studio I (to be renamed Capstone Project)
- CS 5363 Software Project Management
- CS 5369 Web-Based Software Systems
- CS 5380 Fault Tolerant Computer Systems
- IE 5320 Systems Theory

B. Number and types of degrees awarded



	04/05	05/06	06/07	07/08	08/09	09/10
Bachelor	67	38	39	32	37	
Masters	35	25	15	29	27	
Doctorates	1	5	5	4	1	



Graduate Program Degrees Awarded

Source: Institutional Research and Information Mgmt

Name of Program	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Computer Science	36	30	20	33	28	
Software Engineering	3	1	5	3	4	

Comparison of Degrees Awarded - Fall Data	04/05	05/06	06/07	07/08	08/09	09/10
Auburn University						
Bachelor	62	56	52	52	40	45
Master	20	24	21	18	14	18
Doctoral	3	6	8	9	10	4
Colorado State University						
Bachelor	68	65	62	63	61	55
Master	45	51	41	31	42	37
Doctoral	1	5	6	3	3	3
Mississippi State University						
Bachelor (SE)	25	33	23	23	14	21
Bachelor (CS)	14	12	17	7	11	4
Master	35	24	16	12	14	18
Doctoral	2	5	3	1	4	5
University of North Texas						
Bachelor	97	67	58	81	81	69
Master	24	37	50	51	59	36
Doctoral	2	4	3	4	3	3
University of Texas - Arlington						
Bachelor	15	12	8	14	26	-
Master	83	68	38	37	80	-
Doctoral	2	5	5	3	6	-
Texas Tech						
Bachelor	67	38	39	32	37	
Master	35	25	15	29	27	
Doctoral	1	5	5	4	1	

C. Undergraduate and graduate semester credit hours

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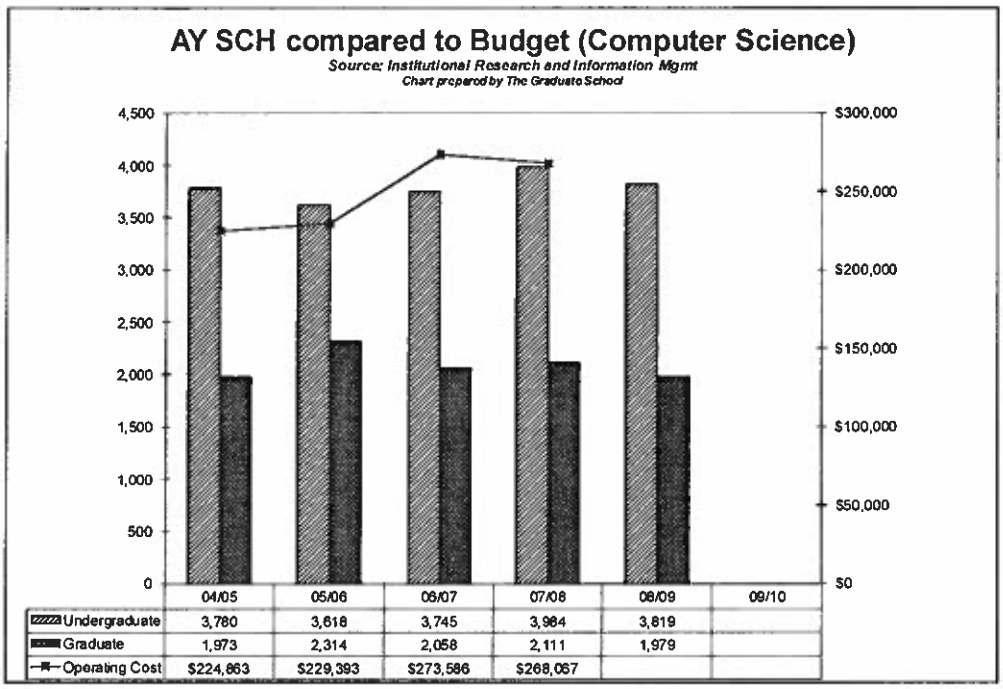
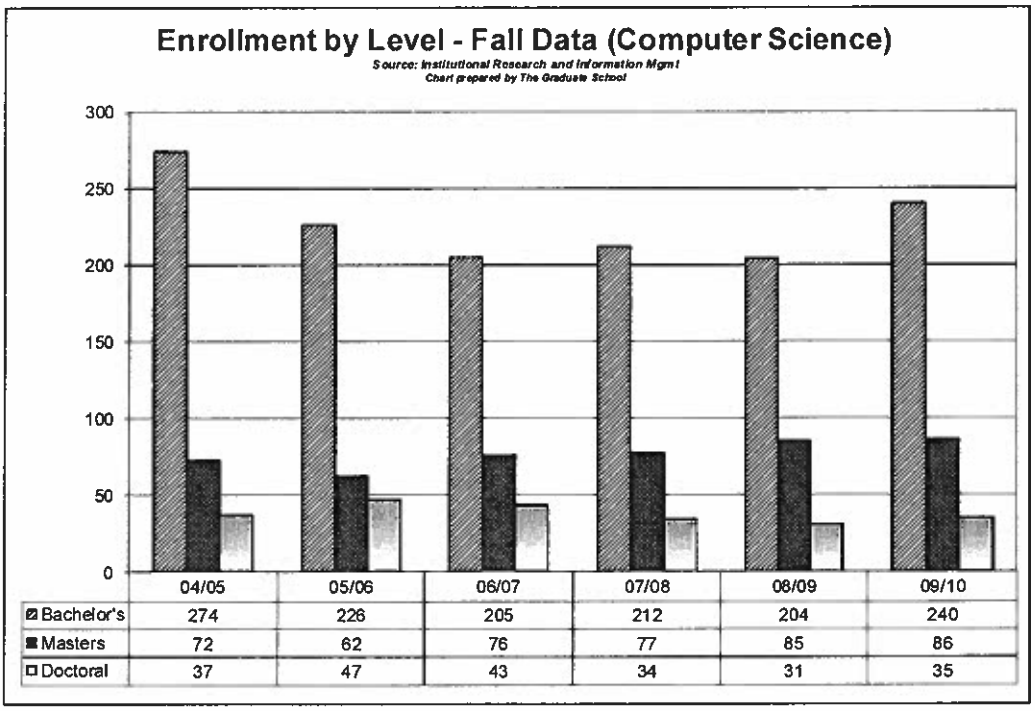
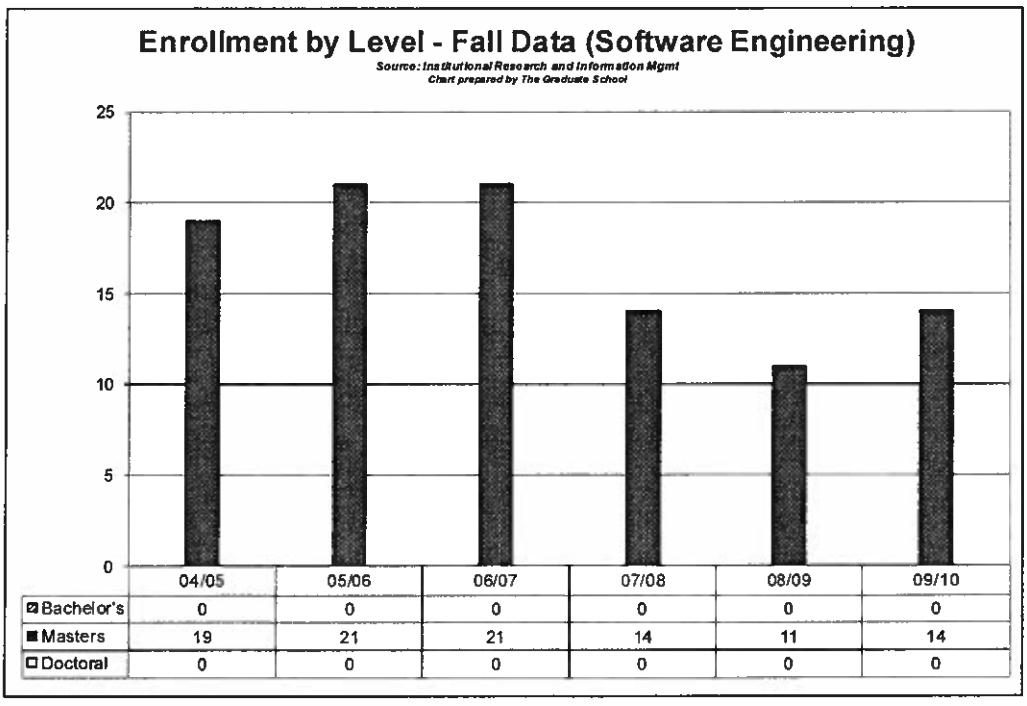


	04/05	05/06	06/07	07/08	08/09	09/10
Undergraduate	3,780	3,618	3,745	3,984	3,819	
Graduate	1,973	2,314	2,058	2,111	1,979	
Operating Cost	$224,863	$229,393	$273,586	$268,057		

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



	04/05	05/06	06/07	07/08	08/09	09/10
Bachelor's	274	226	205	212	204	240
Masters	72	62	76	77	85	86
Doctoral	37	47	43	34	31	35



	04/05	05/06	06/07	07/08	08/09	09/10
Bachelor's	0	0	0	0	0	0
Masters	19	21	21	14	11	14
Doctoral	0	0	0	0	0	0

Source: Institutional Research and Information Mgmt

Name of Program	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Computer Science	109	109	119	111	116	121
Software Engineering	19	21	21	14	11	14

Comparison of Enrollment - Fall Data	04/05	05/06	06/07	07/08	08/09	09/10
Auburn University						
Bachelor	362	271	323	264	326	N/A
Master	76	68	63	75	75	N/A
Doctoral	63	62	57	48	48	N/A
Colorado State University						
Bachelor	306	253	261	291	324	362
Master	135	129	118	115	111	109
Doctoral	48	48	49	53	51	58
Mississippi State University						
Bachelor (CS)	158	130	132	116	120	149
Bachelor (SE)	54	51	59	53	57	51
Master	54	45	35	35	34	30
Doctoral	23	23	31	36	38	38
University of North Texas						
Bachelor	721	818	717	801	723	529
Master	78	196	123	140	130	139
Doctoral	37	53	38	49	54	64
University of Texas - Arlington						
Bachelor	68	94	101	101	116	158
Master	225	147	128	155	162	136
Doctoral	31	38	32	32	38	38
Texas Tech						
Bachelor	274	226	205	212	204	240
Master	72	62	76	77	85	86
Doctoral	37	47	43	34	31	35

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

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

Course Enrollments by Academic Year

Source: Institutional Research and Information Mgmt
Table Prepared by The Graduate School

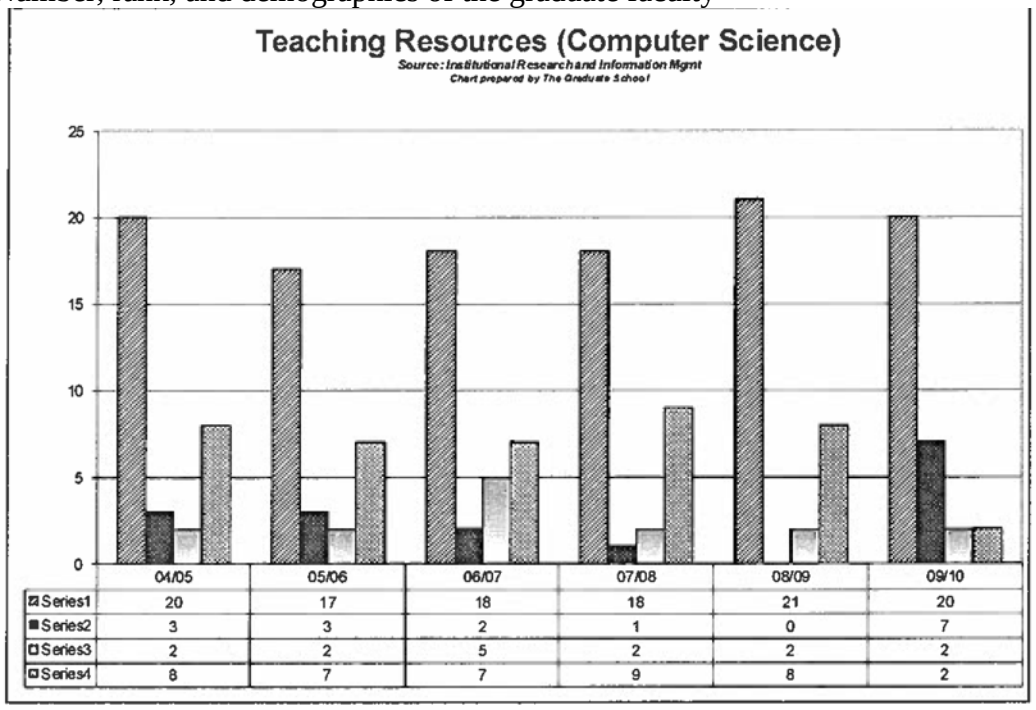
DEPT	Subject	COURSE	2004-05	2005-06	2006-07	2007-08	2008-09 (Fall 08 only)	2009-10	Total
C S	C S	5000	18	8	6	28	4		64
C S	C S	5301	17	10	6	6	3		42
C S	C S	5302	9	6	6	5	3		29
C S	C S	5303	0	7	6	3	0		16
C S	C S	5320	0	9	0	12	0		21
C S	C S	5321	0	10	0	0	0		10
C S	C S	5328	0	0	12	0	0		12
C S	C S	5331	64	85	104	84	23		360
C S	C S	5332	27	29	16	0	20		92
C S	C S	5341	0	0	0	14	0		14
C S	C S	5352	13	29	5	15	0		62
C S	C S	5353	13	17	4	0	9		43
C S	C S	5355	0	0	0	0	24		24
C S	C S	5356	5	7	0	12	0		24
C S	C S	5357	10	0	4	0	0		14
C S	C S	5358	6	0	0	0	0		6
C S	C S	5359	3	0	0	0	0		3
C S	C S	5361	0	0	11	5	0		16
C S	C S	5362	29	20	53	0	0		102
C S	C S	5363	20	15	23	9	0		67
C S	C S	5364	18	5	0	0	0		23
C S	C S	5365	13	3	9	0	0		25
C S	C S	5368	20	56	21	45	24		166
C S	C S	5369	29	23	33	0	0		85
C S	C S	5373	0	0	0	20	0		20
C S	C S	5374	0	0	40	35	0		75
C S	C S	5375	31	28	28	27	20		134
C S	C S	5376	17	0	13	14	16		60
C S	C S	5377	16	17	15	9	0		57
C S	C S	5379	0	9	0	14	20		43
C S	C S	5380	2	0	0	28	23		53
C S	C S	5381	22	25	51	24	24		146
C S	C S	5383	24	21	58	7	0		110
C S	C S	5384	34	7	10	41	22		114
C S	C S	5388	18	0	0	11	0		29
C S	C S	5391	0	0	0	0	17		17
C S	C S	5392	0	0	19	0	0		19
C S	C S	6000	103	84	87	80	25		379
C S	C S	7000	67	51	48	33	16		215
C S	C S	8000	52	63	61	59	13		248
Totals			700	644	749	640	306	0	3039

F. Courses cross listed (syllabus included behind)

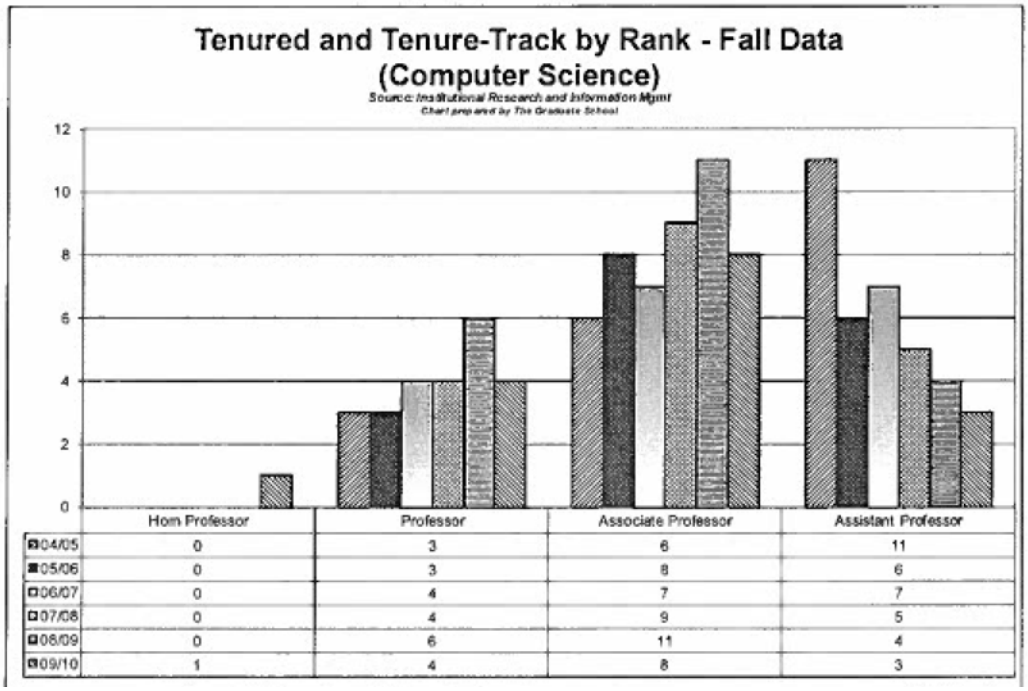
Not applicable.

III. Faculty

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



	04/05	05/06	06/07	07/08	08/09	09/10
Series1	20	17	18	18	21	20
Series2	3	3	2	1	0	7
Series3	2	2	5	2	2	2
Series4	8	7	7	9	8	2



	Hom Professor	Professor	Associate Professor	Assistant Professor
04/05	0	3	6	11
05/06	0	3	8	6
06/07	0	4	7	7
07/08	0	4	9	5
08/09	0	6	11	4
09/10	1	4	8	3

B. List of faculty members

List <u>all</u> faculty who were employed by your department during the six years of this review

FACULTY NAME	JOB TITLE	HIRE DATE	END DATE	Member of Grad Faculty? Y or N
Andersen, Per	Assistant Professor	2003	2009	Y
Lakhani, Gopal	Associate Professor	1988		Y
Lopez-Benitez, Noe	Associate Professor	1993		Y
Mengel, Susan	Associate Professor	1996		Y
Temkin, Bharti	Associate Professor	1996	2010	Y
Cooke, Daniel	Horn Professor	1999	2010	Y
Pyeatt, Larry	Associate Professor	1999		Y
Sinzinger, Eric	Associate Professor	1999		Y
Watson, Richard	Associate Professor	1999		Y
Gelfond, Michael	Professor	2000		Y
Hernandez, Hector	Associate Professor	2000	2006	Y
Desrosiers, Raymond	Associate Professor	2001	2009	N
Zhuang, Yu	Associate Professor	2001		Y
Sobolewski, Mike	Professor	2002	2009	Y
Rushton, J Nelson	Associate Professor	2002		Y
Shin, E Michael	Associate Professor	2002		Y
Leung, Ka-Cheong	Assistant Professor	2002	2005	Y
Barnes, Jack	Professor	2002	2007	Y
Zhang, Yuanlin	Assistant Professor	2004		Y
Hewett, Rattikorn	Professor	2004		Y
Youn, Eunseog	Assistant Professor	2006		Y
Sridharan, Mohan	Assistant Professor	2008		Y
Urban, Joseph	Professor	2008		Y
Urban, Susan	Professor	2008		Y
Siami Namin, Akbar	Assistant Professor	2008		Y
Lim, Sunho	Assistant Professor	2009		Y
Denton, Jason	Assistant Professor	2002	2007	Y
Seker, Remzi	Assistant Professor	2004	2005	Y

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

Publication Type	2004 N= F=22	2005 N= F=20	2006 N= F=20	2007 N= F=18	2008 N= F=22	2009 N= F=20
Refereed Articles/Abstracts	40	35	37	34	53	45
Books/Book Chapters	5	3	0	3	3	3
Other Publications	0	0	0	0	0	0
Presentations/Posters	2	3	10	8	7	8
N = # of full time faculty contributing F = # of full time faculty in department						

D. Responsibilities and leadership in professional societies

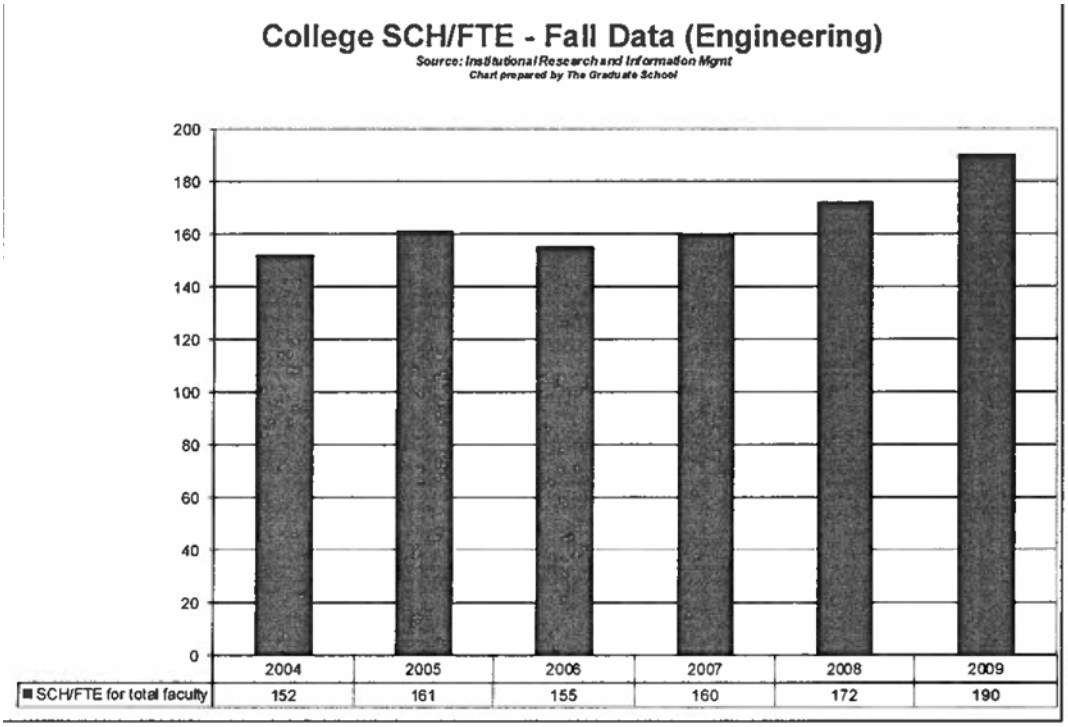
Professional Leadership	2004 N= F=22	2005 N= F=20	2006 N= F=20	2007 N= F=18	2008 N= F=22	2009 N= F=20
Editor/Editorial	8	7	8	9	15	13
Executive Board	6	2	0	6	5	3
Officer in National Org.	1	2	1	1	1	0
Committees	85	96	88	112	151	121
Proposal Review Panels	5	4	3	3	8	8
N = # of full time faculty contributing F = # of full time faculty in department						

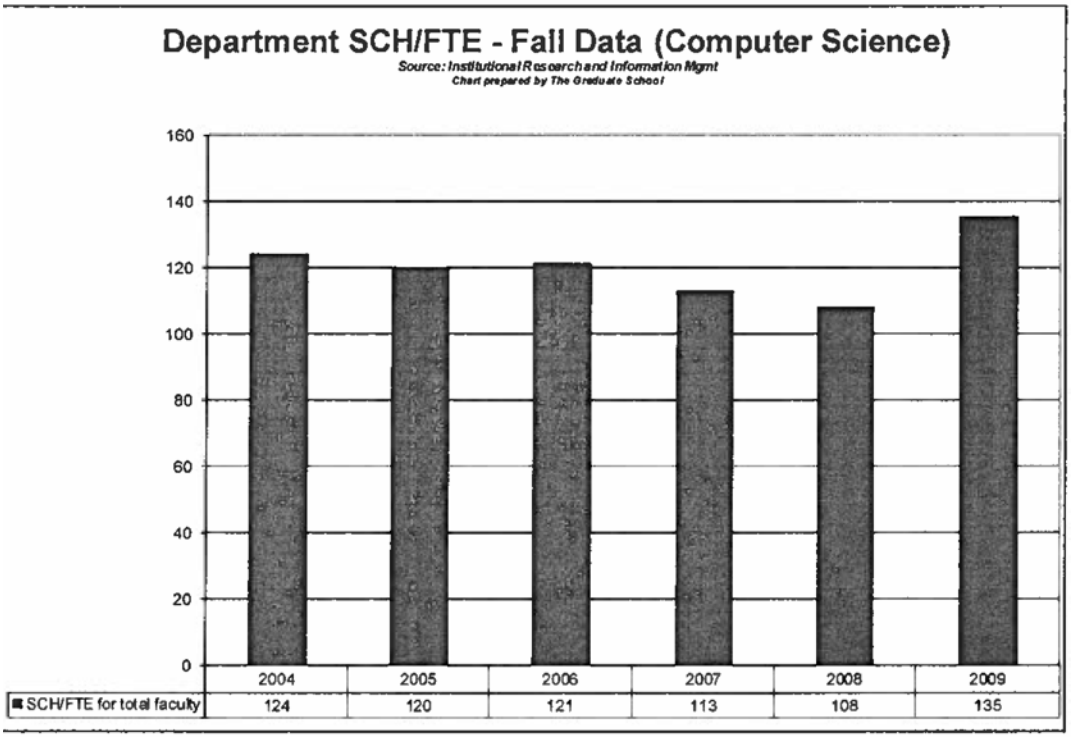
	Committees Chaired		Committees Served in department		Committees Served outside department	
Faculty Name	Masters	Doctoral	Masters	Doctoral	Masters	Doctoral
Andersen, Per (2004 – 2008)	3	1	4	1	0	0
Cooke, Daniel (2004 – 2009)	5	8	0	3	0	0
Denton, Jason (2004-2005)	2	1	0	0	0	0
Desrosiers, Ray (2004–2007)	1	0	0	0	0	0
Gelfond, Michael (2004-2009)	2	7	0	1	0	5
Hernandez, Hector (2004)	4	2	0	0	0	0
Hewett, Rattikorn (2004-2009)	4	2	4	0	0	0
Lakhani, Gopal (2004-2008)	3	1	4	0	0	0
Lim, Sunho (2009)	6	1	0	0	0	0
Lopez-Benitez, Noe (2004-2009)	10	5	9	1	0	2
Mengel, Susan (2004-2009)	16	5	7	3	0	3
Pyeatt, Larry (2006-2009)	7	6	0	0	0	0
Rushton, J Nelson (2004-2009)	2	3	4	8	0	0
Seker, Remzi (2004)	1	0	0	0	0	1
Shin, E Michael (2004 – 2009)	9	4	8	4	0	0
Siami Namin, Akbar (2009)	6	0	2	0	0	0
Sinzinger, Eric (2004 – 2009)	11	5	3	2	0	0
Sobolewski, Mike (2004 – 2008)	24	2	0	0	0	0
Sridharan, Mohan (2008 – 2009)	2	2	3	0	0	0
Temkin, Bharti (2004 – 2005)	4	2	1	0	0	0
Urban, Joseph (2008 – 2009)	7	0	0	0	0	0
Urban, Susan (2008 – 2009)	4	2	0	0	0	0
Watson, Richard (2004 – 2005)	9	3	13	24	0	3
Youn, Eunseog (2006 – 2009)	5	4	2	2	0	1
Zhang, Yuanlin (2004 – 2009)	3	5	5	0	0	0
Zhuang, Yu (2004 – 2009)	9	6	19	2	0	0

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

FACULTY WORKLOAD

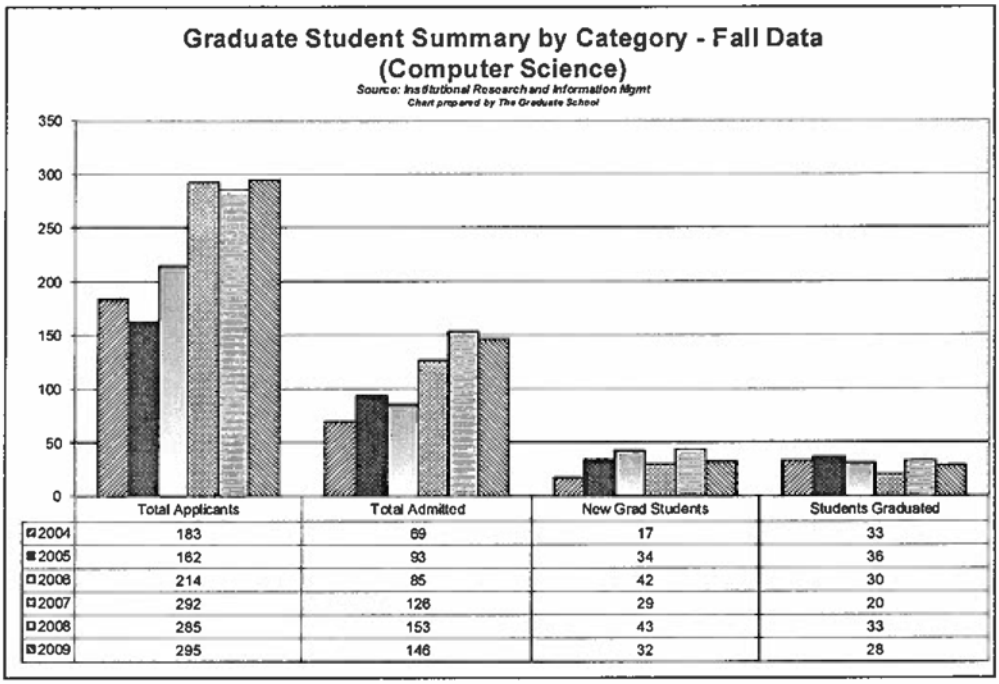
	2004	2005	2006	2007	2008	2009
University	16.23	15.82	16.08	15.44	15.55	16.30
College	15.79	14.35	14.91	14.63	14.82	14.51
Department	17.11	15.17	18.94	16.38	16.57	17.39


College SCH/FTE - Fall Data (Engineering)
Source: Institutional Research and Information Mgmt
Chart prepared by The Graduate School
200
180
160
140
120
100
80
60
40
20
0
2004
2005
2006
2007
2008
2009
SCH/FTE for total faculty
152
161
155
160
172
190

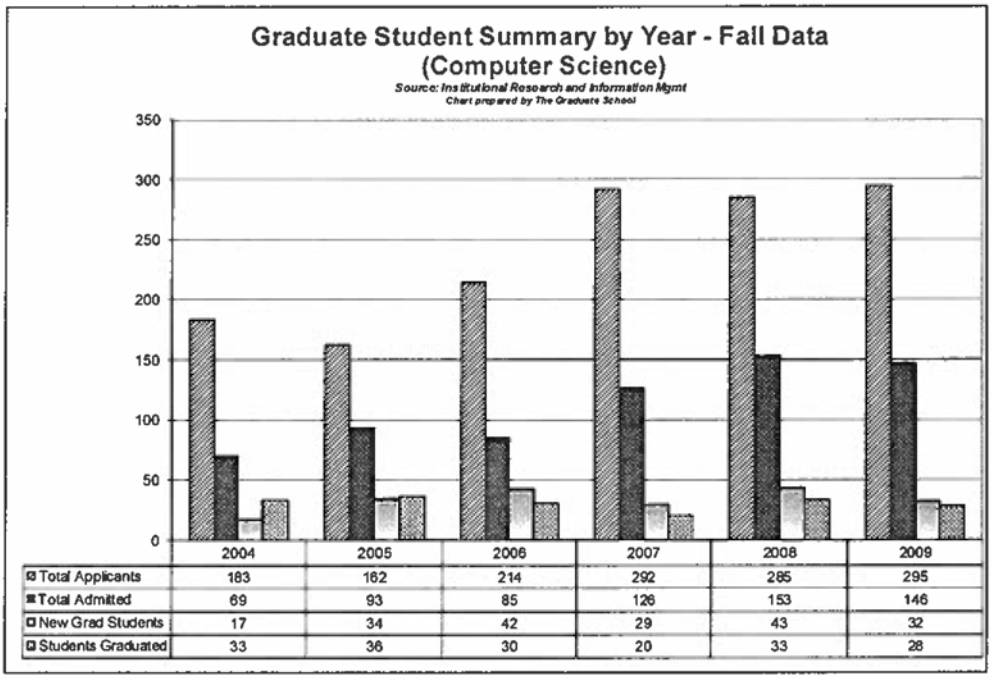

Department SCH/FTE - Fall Data (Computer Science)
Source: Institutional Research and Information Mgmt
Chart prepared by The Graduate School
160
140
120
100
80
60
40
20
0
2004
2005
2006
2007
2008
2009
SCH/FTE for total faculty
124
120
121
113
108
135

IV. Graduate Students

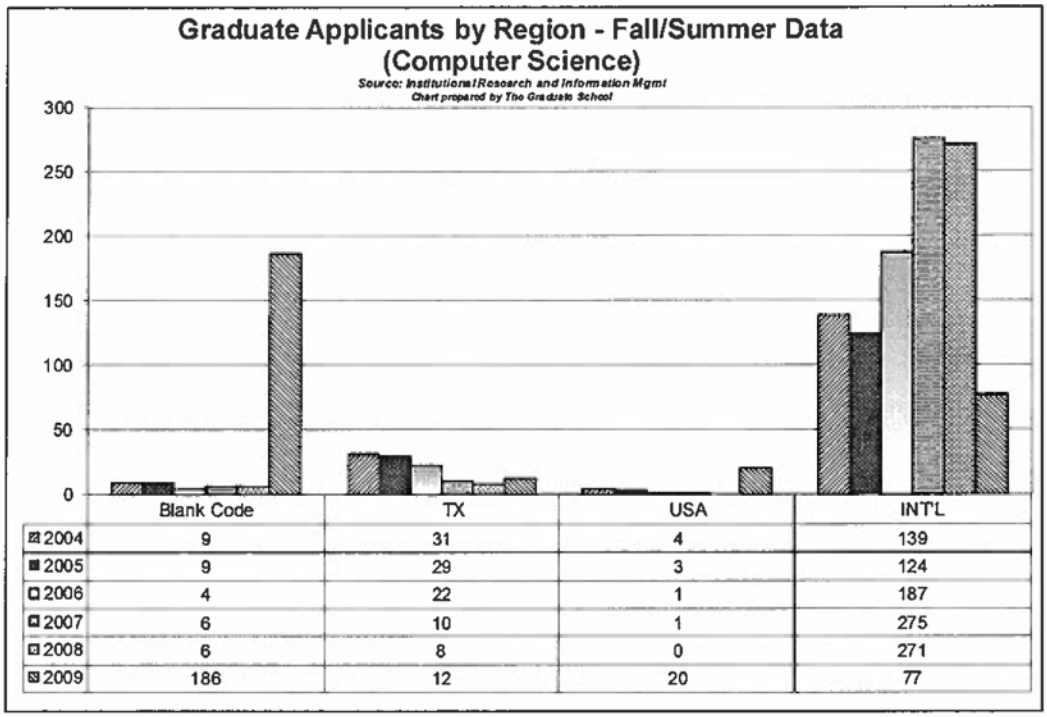
A. Demographics of applicants and enrolled students



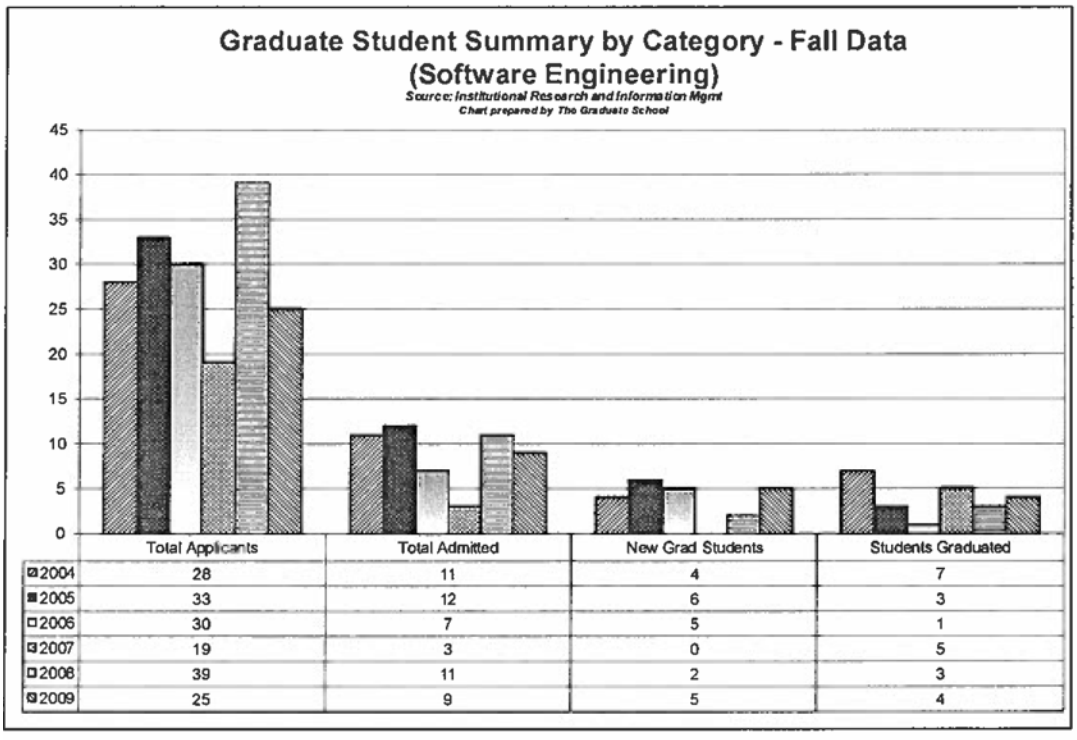
	Total Applicants	Total Admitted	New Grad Students	Students Graduated
2004	183	69	17	33
2005	162	93	34	36
2006	214	85	42	30
2007	292	126	29	20
2008	285	153	43	33
2009	295	146	32	28



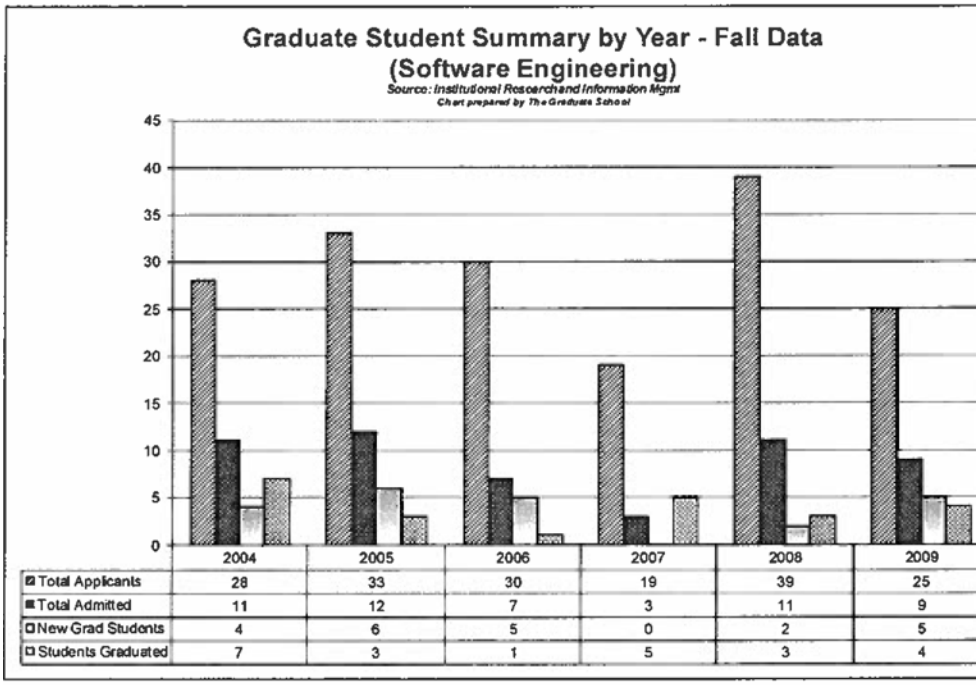
	2004	2005	2006	2007	2008	2009
Total Applicants	183	162	214	292	285	295
Total Admitted	69	93	85	126	153	146
New Grad Students	17	34	42	29	43	32
Students Graduated	33	36	30	20	33	28



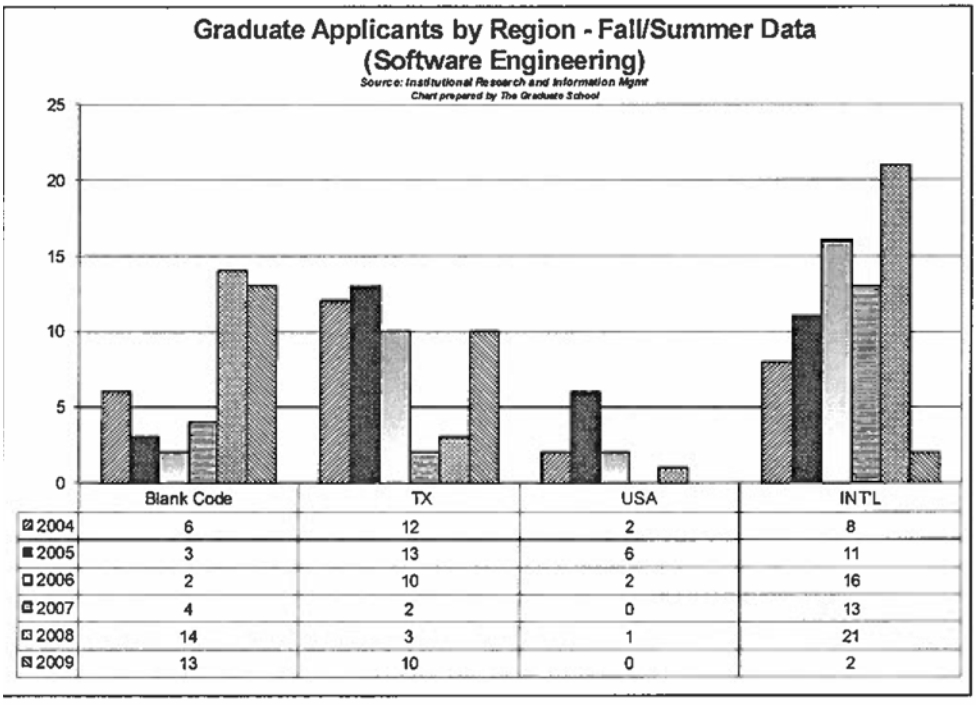
	Blank Code	TX	USA	INT'L
2004	9	31	4	139
2005	9	29	3	124
2006	4	22	1	187
2007	6	10	1	275
2008	6	8	0	271
2009	186	12	20	77



	Total Applicants	Total Admitted	New Grad Students	Students Graduated
2004	28	11	4	7
2005	33	12	6	3
2006	30	7	5	1
2007	19	3	0	5
2008	39	11	2	3
2009	25	9	5	4



	2004	2005	2006	2007	2008	2009
Total Applicants	28	33	30	19	39	25
Total Admitted	11	12	7	3	11	9
New Grad Students	4	6	5	0	2	5
Students Graduated	7	3	1	5	3	4



	Blank Code	TX	USA	INT'L
2004	6	12	2	8
2005	3	13	6	11
2006	2	10	2	16
2007	4	2	0	13
2008	14	3	1	21
2009	13	10	0	2

Computer Science:

Graduate Applicants - Fall Data												
	2004		2005		2006		2007		2008		2009	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	0	0	0	1	0	0
Asian	1	6	0	1	5	21	2	1	1	0	0	0
Black	1	0	0	0	2	1	0	1	0	0	0	1
Hispanic	2	2	1	3	0	4	1	3	0	2	2	0
Non-Resident	34	100	33	83	33	99	56	194	53	202	54	220
Unknown	0	9	5	6	13	18	9	13	1	13	0	1
White	4	24	5	25	3	15	1	11	1	11	1	16
Gender Total	42	141	44	118	56	158	69	223	56	229	57	238
Total Applicants	183		162		214		292		285		295	
Admitted Graduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	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	1	0	1	0	4	1	1	1	0	0	0
Black	1	0	0	0	1	0	0	0	0	0	0	0
Hispanic	1	2	0	2	0	1	0	2	0	1	1	0
Non-Resident	12	33	18	51	12	48	27	80	35	105	33	103
Unknown	0	3	2	0	7	6	3	3	1	5	0	1
White	3	13	3	16	1	5	1	8	0	5	0	8
Gender Total	17	52	23	70	21	64	32	94	37	116	34	112
Total Admitted	69		93		85		126		153		146	
Enrolled New Graduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	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	0	3	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	0	1	0	1	0	1	0	0	0	0	0	0
Non-Resident	1	9	8	16	7	22	5	19	11	31	8	24
Unknown	0	2	1	0	2	2	0	3	0	0	0	0
White	0	4	1	7	1	4	0	2	0	1	0	0
Gender Total	1	16	10	24	10	32	5	24	11	32	8	24
Total Enrolled	17		34		42		29		43		32	

Computer Science cont.:

Demographics of Enrolled Graduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	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	1	3	1	2	0	6	1	4	1	2	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	1	4	0	6	0	3	0	2	0	2	0	2
Non-Resident	7	62	11	52	17	54	16	57	21	67	25	81
Unknown	1	3	2	3	3	6	3	4	1	3	0	0
White	4	23	4	28	4	26	2	22	2	17	1	12
Gender Total	14	95	18	91	24	95	22	89	25	91	26	95
Graduate	109		109		119		111		116		121	

Demographics of Enrolled Undergraduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	2	0	4	0	4	0	2	0	0	1	0
Asian	0	17	0	9	0	10	1	9	1	10	0	8
Black	1	4	2	8	1	8	4	11	1	12	3	13
Hispanic	4	34	3	24	5	21	2	25	4	27	3	27
Non-Resident	1	8	1	5	1	1	0	0	0	1	3	5
Unknown	0	0	0	1	0	1	0	0	0	2	0	2
White	17	186	8	161	10	143	11	147	10	136	18	157
Gender Total	23	251	14	212	17	188	18	194	16	188	28	212
Undergraduate	274		226		205		212		204		240	

Software Engineering:

Graduate Applicants - Fall Data												
	2004		2005		2006		2007		2008		2009	
	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	0	2	0	1	2	1	0	0
Black	1	0	1	1	0	2	0	0	0	1	0	0
Hispanic	0	1	0	2	0	1	0	0	0	1	0	0
Non-Resident	1	7	3	6	7	6	1	11	4	12	3	12
Unknown	1	6	1	5	0	1	0	1	1	4	0	1
White	0	11	1	12	2	9	1	4	3	10	2	7
Gender Total	3	25	7	26	9	21	2	17	10	29	5	20
Total Applicants	28		33		30		19		39		25	

Admitted Graduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	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	0	0	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	0	0	0	1	0	1	0	0	0	0	0	0
Non-Resident	1	4	3	2	1	2	0	1	2	4	2	3
Unknown	1	1	0	3	0	0	0	0	0	2	0	0
White	0	4	0	3	0	3	1	1	1	2	2	2
Gender Total	2	9	3	9	1	6	1	2	3	8	4	5
Total Admitted	11		12		7		3		11		9	

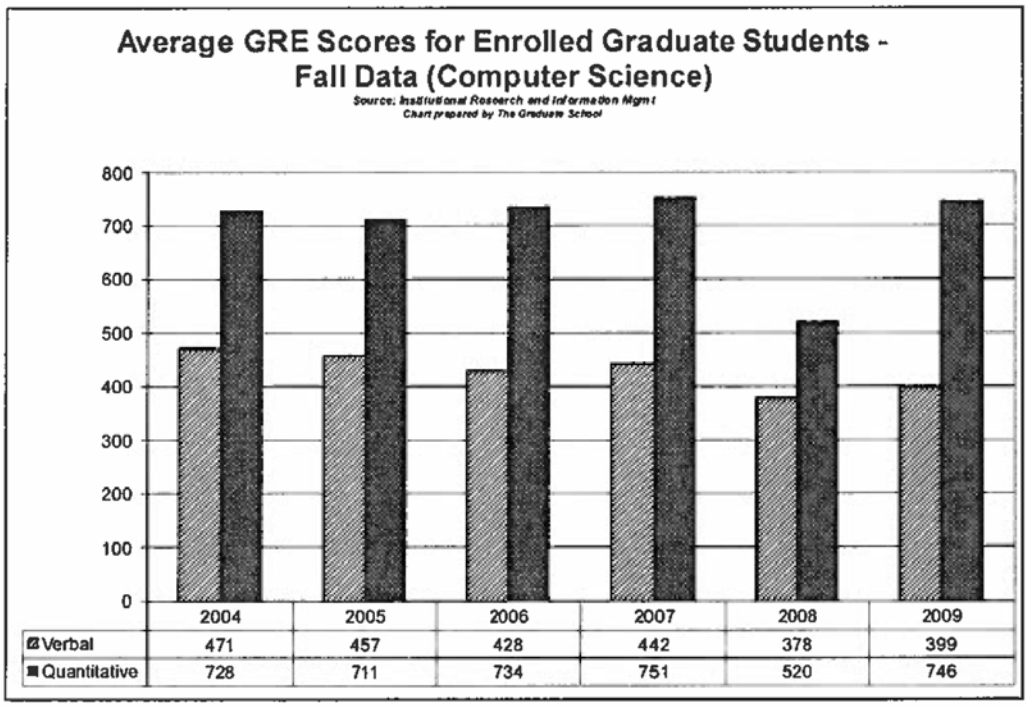
Enrolled New Graduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident	0	2	0	3	0	2	0	0	1	0	1	1
Unknown	1	0	0	1	0	0	0	0	0	1	0	0
White	0	1	0	2	0	3	0	0	0	0	2	1
Gender Total	1	3	0	6	0	5	0	0	1	1	3	2
Total Enrolled	4		6		5		0		2		5	

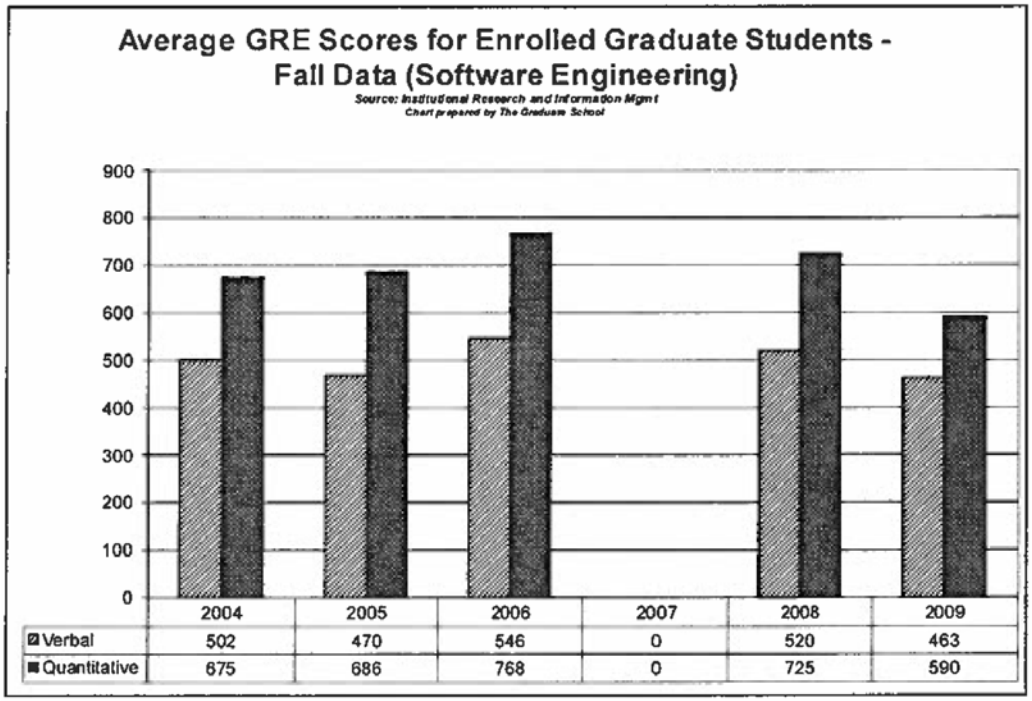
Software Engineering cont.:

Demographics of Enrolled Graduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	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	0	0	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	0	0	0	0	0	1	0	1	0	1	0	0
Non-Resident	1	2	0	4	0	6	0	1	1	0	2	2
Unknown	1	2	0	2	0	1	0	1	0	2	0	1
White	0	13	1	14	2	11	1	10	0	7	3	6
Gender Total	2	17	1	20	2	19	1	13	1	10	5	9
Graduate	19		21		21		14		11		14	

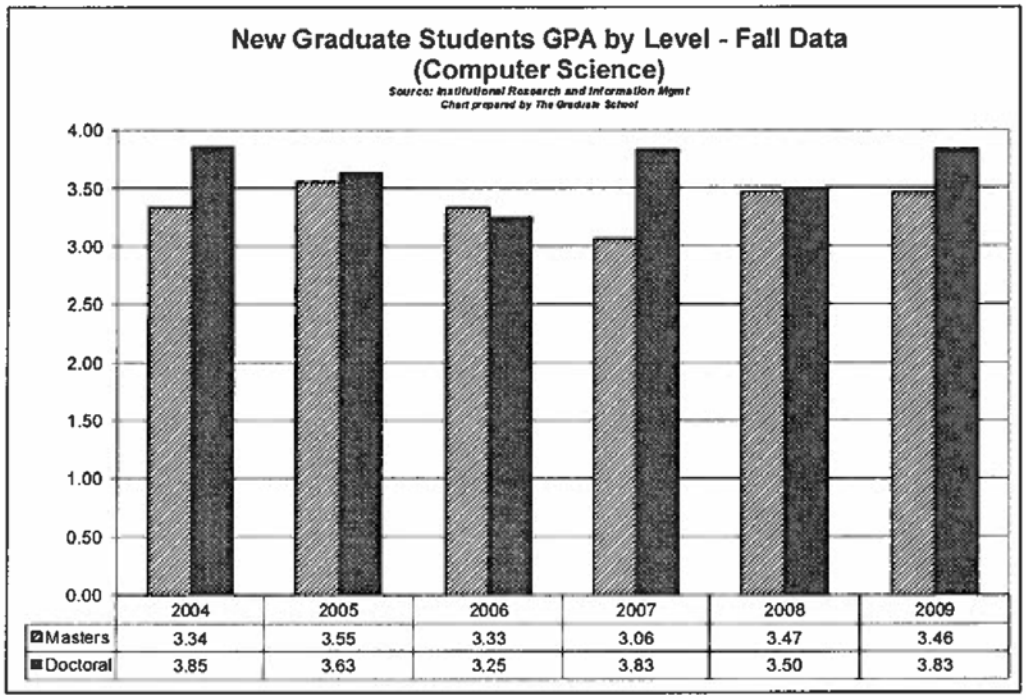
Demographics of Enrolled Undergraduate Students - Fall Data												
	2004		2005		2006		2007		2008		2009	
	F	M	F	M	F	M	F	M	F	M	F	M
Amer Ind	0	0	0	0	0	0	0	0	0	0	0	0
Asian	0	0	0	0	0	0	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Hispanic	0	0	0	0	0	0	0	0	0	0	0	0
Non-Resident	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
White	0	0	0	0	0	0	0	0	0	0	0	0
Gender Total	0	0	0	0	0	0	0	0	0	0	0	0
Undergraduate	0		0		0		0		0		0	

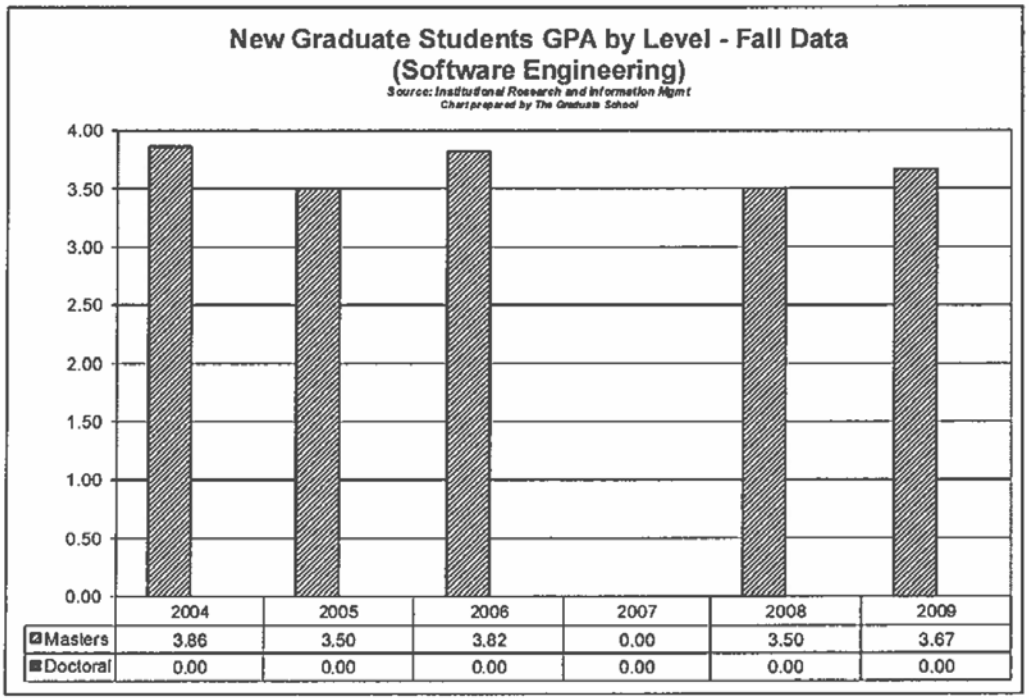
B. Test scores (GRE, GMAT and/or TOEFL) of enrolled students



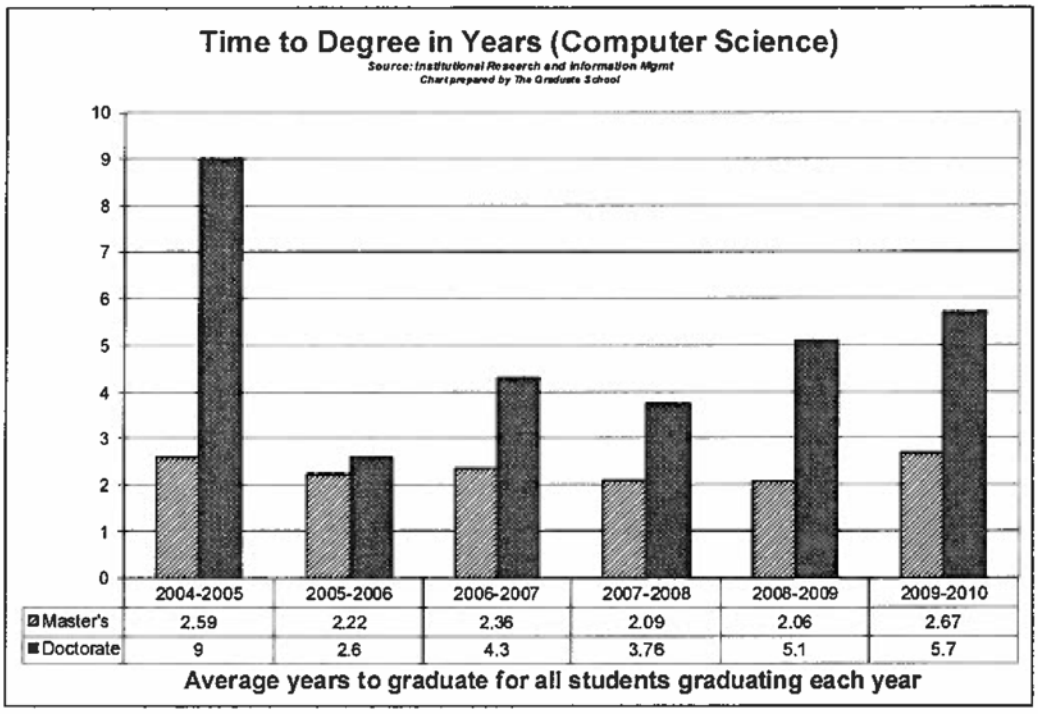


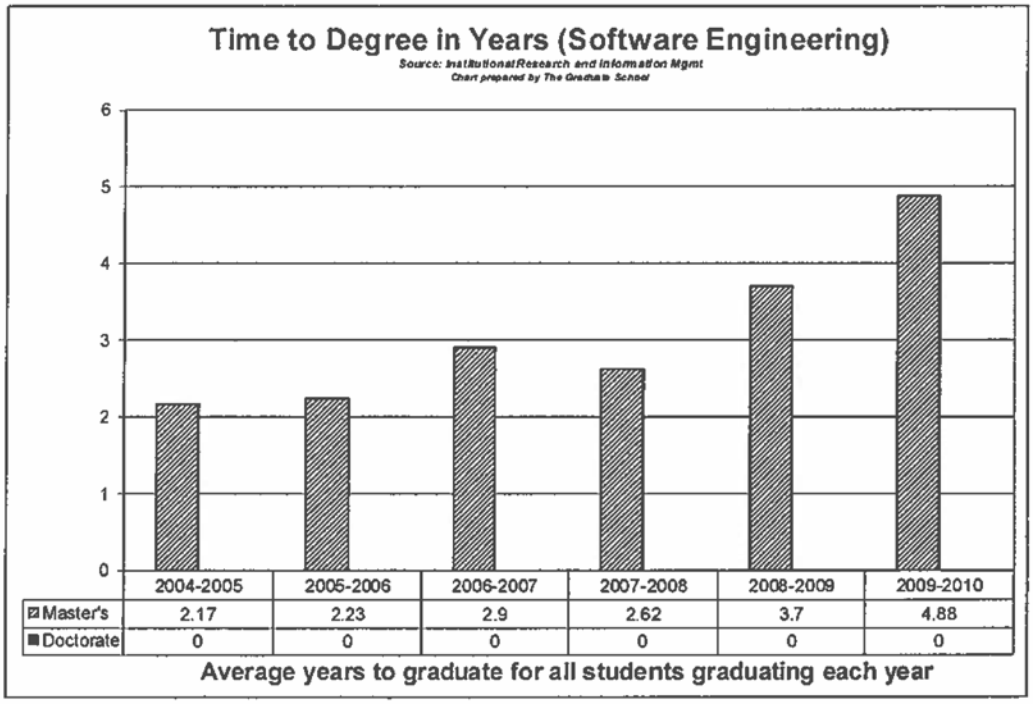
C. GPA of new students



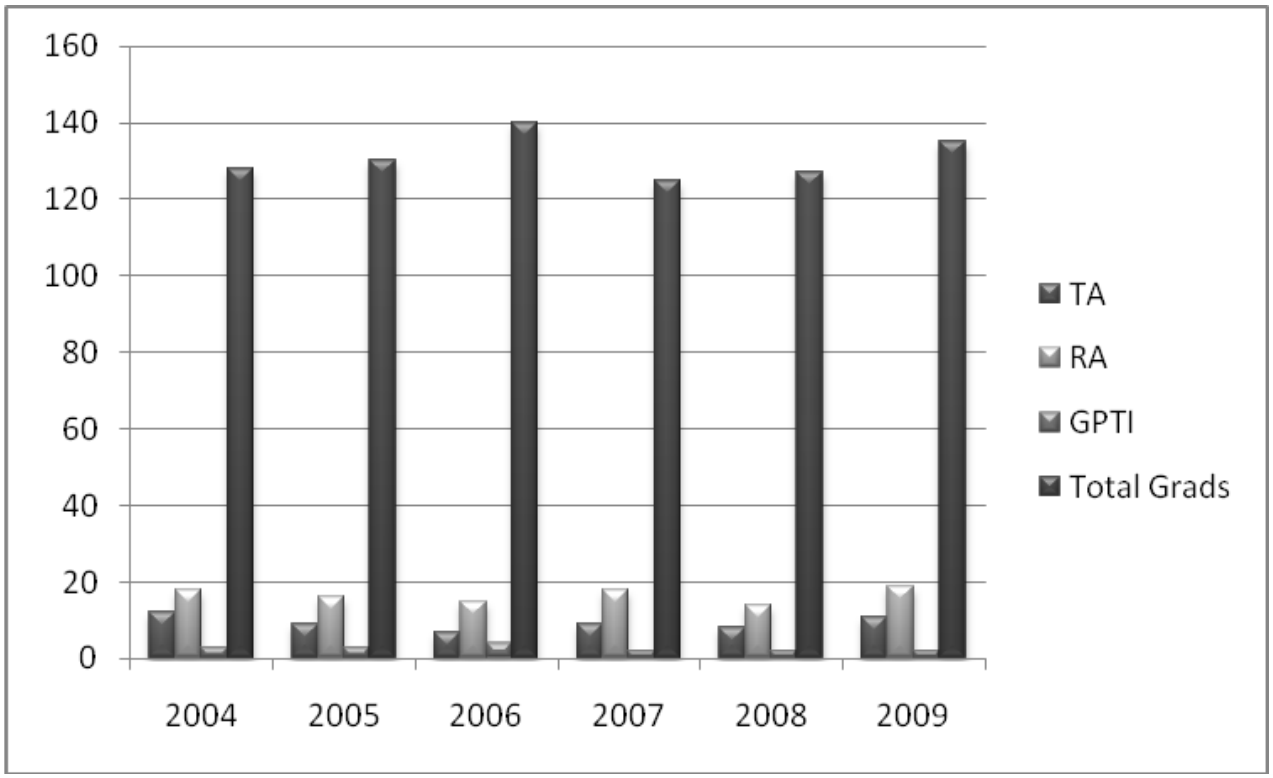


D. Time to Degree in Years – Average years to graduate for all students graduating each year





E. Number of RA's, TA's or GPTI's, with total number of graduate students in the program.



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

Name	Initial Position	Initial Employer	Location
2004-2005			
Vijay N Cheleenahalli			
Sandeep Chintabathina	PhD Candidate	Texas Tech Univ.	Lubbock, TX
Mukundan Desikan			
Vamikrishna Gudimetla			
Sharath Hegde		ABB Corporate Research CTR	India
Vivek Jaiswal	Program Analyst	Supreme Soft, Inc.	Gaithersburg, MD
Arun-Moses Jesubatham B			
Changsu Jiang	Java/J2EE Developer	5 Square Systems	Westlake Village, CA
Loveleen R Kolvekar	Sr Software Engineer	Microsoft Corp.	Seattle, WA
Kranthi K R Malreddy			
Naga V B Manchi		Microsoft Corp	Seattle, WA
Gurkan Ozfidan			
Rama-Krishna Pathangi			
Julian Russbach	Unix Programmer	Blue Cross Blue Shield	TX
Sekhar Soorianarayanan			
Lei Wu			
Saurabh Bhatla			
Nianen Chen			
Naveen-Kumar Chikoti			
Sujoy Ganguly			
Nicholas J Gianoutsos		National Park Service	AK
Jianjun Zheng	Programmer/Analyst II	Texas Tech Univ	Lubbock, TX
Chaitanya V S Gorugontula			
Karan M Gupta			
Sandhya Madireddy			
Ravi-Kiran Malladi-Venkata			
Kiran Manoah Masapari			
Sivabalan Muthukumar		TTUHSC	Lubbock, TX
Abhijit Rai	Administrator	Abacuss	Groton, CT
Rajesh Subedi	Senior Developer	SAC	Fairfield, CT
Marta E Calderon Campos	Associate Professor	Universidad de Costa Rica	Costa Rica

Chencheng Li			
Thimmayya K Ame			
Zhipeng Gong			
Shivaji Marisarla			WA
Ruihua Niu			
Rattasak Srisinroongruang	PhD Candidate	Texas Tech Univ.	Lubbock, TX
Steven W Conley			
2005-2006			
Marcello Balduccini		Kodak Research Ctr	Rochester, NY
Changming Ma		Microsoft Corp	Seattle, WA
Erhan Onal	Software Developer	United Health Technology	Minneapolis, MN
Curtis R Welborn	Assistant Professor	Utah Valley Univ	Orem, UT
Christopher S Cavin	CS Engineer	Raytheon Company	Ft. Worth, TX
Michael F Clement			
Hamideh A Hassouneh			
Vivek Khurana			
Raymond S Pettit	Professor	Abilene Christian Univ	Abilene, TX
Manu Ravichandran			
Milan Todorovic	Network Engineer	N-Comm	Lubbock, TX
Rajesh Vuta	Systems Analyst	Ika Systems	Southborough, MA
Jason T Digiacomo			
Colleen Fitzpatrick Berg	Instructor	Texas Tech Univ	Lubbock, TX
Michael D Bullington	Data Technician	Perot Systems	Plano, TX
Li Liu		United Space Alliance	Houston, TX
Jeffrey David Moravec			
Rajkumar Murthy			
Krit Panichpisal			
Ravi S R Patel			
Ratheesh Raghavan			
Nitin R Ramannavar	Software Engineer	Sun Microsystems	Menlo Park, CA
Mohsin M S Shaikh	Consultant	Shell Oil Company	Houston, TX
Joaquin Zaragoza			
Eric J Acosta			
Saleem Mohamed Jamal			
Yongjun Rong		Boomi, Inc.	Berwyn, PA
Santhosh Swaminathan	Sr. Software Engineer	Ika Systems Inc	Southborough, MA
Shiva S Vaidyanathan			

2006-2007			
Maximilian Berger			Germany
Michael T Helm	Assistant Professor	Florida State Univ	Panama City, FL
Robert G Watson	Assistant Professor	McMurry Univ	Abilene, TX
Michael M De La Rosa			
Ameya P Malvankar			
Sophia G Penumaka			
Muralidharan Raghavan	Software Engineer	Sun Microsytems	Menlo Park, CA
Aniruddha P Kulkarni	Software Engineer	Microsoft Corp.	Seattle, WA
James R Wood		Concorde Financial Corp	Dallas, TX
Dwayne Earl Towell			
Chitikesi J Babu			
Gregory Gelfond	Software Engineer	Ebay	CA
Immanuel B Regunesan			
Prashant Khadka	Oracle Developer	Merrill Lynch	Hopewell, NJ
Shane A Laurent		Pantex	Amarillo, TX
Sunhyuck Hong	Programmer/Analyst	Texas Tech Univ.	Lubbock, TX
Swetha Dorbala	Network Engineer	Cisco	San Jose, CA
Bharathi Gavirineni			
Daniela Inclezan	PhD Candidate	Texas Tech Univ	Lubbock, TX
Yin Lu	Software Engineer	Atypon Systems, Inc	Santa Clara, CA
Rohini Rajagopalan			
Shravan S Vurputoor			
Fajin Wang	PhD Candidate	Texas Tech Univ	Lubbock, TX
Laura E Worthy		Raytheon	TX
Bosah Ikenna Chukwuogo	Software Engineer	Amazon.com	
2007-2008			
Yaoqin Jin			
Zhijun Lin			
Veena S Mellarkod		MathWorks	Boston, MA
Khuong N Vu	PhD Candidate	Univ. of Houston	Houston, TX
Gregory Wagner		Raytheon	AZ
Vijay Akkineni			
Viktoria Gontcharova	PhD Candidate	Texas Tech Univ	Lubbock, TX
Bhavya Malhotra	Software Developer	Tyler Technologies	Plano, TX
Nipul K Patel			
Kautilya K Tyagi			
Gowri S R Velagala			
James L Haynes		Pantex	Amarillo, TX

Arun Parajuli			
Daniel J Richards		Raytheon	TX
Sreekanth Bobbala			
Eric N Garcia	PhD Candidate	Texas Tech Univ	Lubbock, TX
Sidney A Isaacs			
Chaitanya Kasarkod			
Daniel R Kerr			
Chris D Lemmons			
Gowthami Shri Maram			
Bradley D Null	Engineering Scientist	Applied Research Labs – UT	Austin, TX
Tammy M Reese			
Eswar Balasubrahmanyan			
Jalaram Biyyapu			
Srikar R Chadhivae			
Sujatha Chappidi			
Eduardo A Colmenares Diaz	PhD Candidate	Texas Tech Univ	Lubbock, TX
Lalitha Dandipalli			
Kiran G R Sunanda	Tech Software Prof.	Halliburton	Houston, TX
Naveen K G R Sunanda			
Pallavi Gurijala			
Krishnaprasad Jagadish			San Francisco, CA
Meenu Narula			
Vikram S Patankar		MySpace	Los Angeles, CA
Lakshmi V Pavuluru			
Aashay V Thipse		MySpace	Los Angeles, CA
Kalyan R Vadlamani			
Nachiappan V Nachiappan	Member, Tech Staff	Sun Microsystems	Santa Clara, CA
2008-2009			
Jung Hoon An			
Sailesh Baidya			
Sujit V Bhosale	Software Developer	Goodman Global, Inc	Houston, TX
Joshua K Blackmon			
Pradeep Bommidi			
Vaibhav V Brid			
Mark W Ford, III			
Divya D K Manjunath			
Satyanarayana Marisetti			
Swetha Siddavatam	Business Analyst	Flowserve Corp.	

Umesh Sunnapu			
Adam R Turner	Assoc. Software Engineer	Overwatch Systems	Austin, TX
Alexander X Pearson			
Fernando G Paniagua	Assistant Professor	Community Collge of Baltimore County	Baltimore, MD
Krishna C Malreddy			
Gregory J McChesney			
Jason T McDaniel			
Renuka Singanamala			
Varun Surana			
Adam M Thomas-Murphy			
Roger L Coffey	Electrical Engineer	B&W Pantex, LLC	Amarillo, TX
Mark E Williamson	PhD – Candidate	Texas Tech Univ.	Lubbock, TX
Yamuna R K Reddy			
Kunyu Li			
Songxin Li		Lenovo Corp	P R China
Sravan K C Mattevada			
John C McCune	Software Engineer	General Dynamics	Scottsdale, AZ
Rekha Mylavarabhatla			
Liang Qu			
Akriti Singhal			
Abinaya Surianarayanan			
Danna M Gianforte			
2009-2010			
Bradley Nemanich	Chief Engineer	Texas Multicore Technologies	Abilene, TX
Vanchinathan A Chandrasekaram			
Srikanth Gadde			
Venkat R Kandukuri			
Arun R K Kudikala			
Sameer Marneni			
Sushmitha Palreddy			
Casey R Richardson	PhD Candidate	TTU – Biology	Lubbock, TX
Arunoday Sarkar			
Naga L Yalamanchili			
Philip R Huffman	Program Engineer	BWTX Pantex	Amarillo, TX
Kenneth P Kramp			
Ziao Liu	Bioengineering Grad. Program	Texas Tech Univ.	Lubbock, TX
Viktoria Gontcharova	Bioinformatician	5AM Solutions	San Francisco,

			CA
Phongphun Kijsanayothin	Faculty	Naresuan Univ.	Thailand
Lawrence D Koenig	Bioinformatician	Research & Testing Labs, LLC	Lubbock, TX
Eddy C Borera	PhD Candidate	Texas Tech Univ	Lubbock, TX
Leslie A Dmello			
Amaresh Ghosh			
Gaurav R Joshi		Epic Systems Corp.	Verona, WI
Mahdi Naser-Moghadasi	PhD Candidate	Texas Tech Univ.	Lubbock, TX
Swakesh Puligilla			
Harshal Raut			
Vedik Shetty	Programmer/Analyst II	Texas Tech Univ.	Lubbock, TX
Rajiv Shrestha		Baker Hughes	
Sharath Srinivasamurthy			
Satish Vellanki	Software Developer	Planview, Inc.	Austin, TX
Sauganth Vijayappan		IBM	TX

G. Type of financial support available for graduate students

The department is committed to providing financial assistance for as many of our students as possible. Support is provided primarily in the form of scholarships, teaching assistantships and research assistantships.

All doctoral students are eligible to be awarded teaching assistantships so long as their past performance is adequate. The remaining teaching assistantships are awarded to masters students on a competitive basis with preference given to students taking the thesis option. Currently enrolled students with a good academic records plus a history of good past performance as a TA or RA are given preference over incoming students. Currently, 4 – 6 TA positions are available per academic year.

The Computer Science department also offers several scholarships each year. These scholarships are usually for $1,000 per academic year. Incoming students' application materials are used for the basis of awarding the majority of these scholarships.

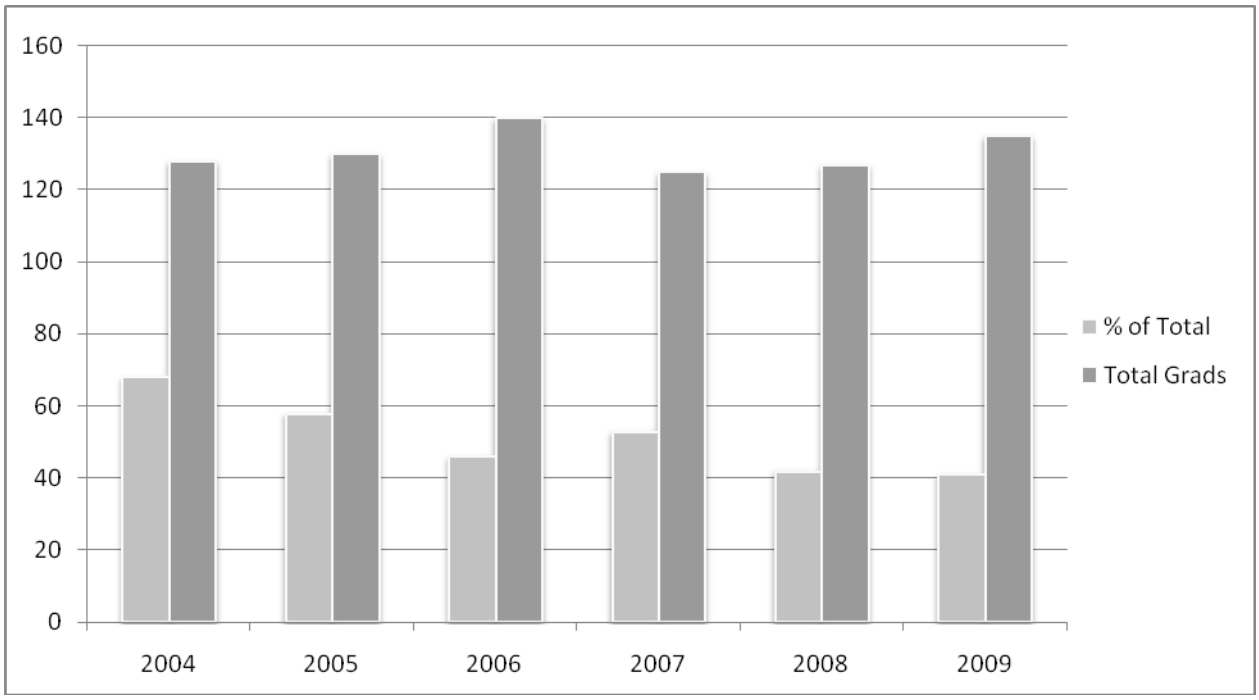
In addition, internal competitive scholarships are available from the College of Engineering (Dean's Fellowship) and the Graduate School (AT&T Chancellor's Fellowship). Also, other monies made available by the Graduate School from incentive funds from the federal government. The Computer Science Department has received two Master's and one Doctoral Fellowship available from Graduate School incentive funds, 4 Dean's Fellowships, and 1 AT&T Chancellor's Fellowship.

It is also planned to seek external scholarship funding in the form of endowments and grants. The Department did receive a Mekong PhD Fellowship from Viet Nam.

AWARD	04/05		05/06		06/07		07/08		08/09		09/10	
	$	# Stud	$	# Stud	$	# Stud	$	# Stud	$	# Stud	$	# Stud
AT&T Chancellors	$3,000	1	$6,000	2	$6,000	2	$3,000	1			$4,000	1
American-Mexican Friendship			$4,000	1	$4,000	1	$4,000	1	$4,000	1	$4,000	1
Helen Devitt Jones							$5,250	1	$1,750	1		
Hazlewood			$3,000	1								
Summer Dissertation	$2,300	1							$2,300	1	$4,600	2
CS Graduate Tuition Scholarship	$39,000	39	$34,000	34	$40,000	38	$31,000	32	$29,000	29	$21,000	17
Dean of Engineering Fellowship							$25,000	1				
Dean of Engineering Fellowship from the Sybil Harrington Living Trust											$12,000	3
Mekong 1000 Fellowship in CS											$18,781	1

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

I. Percentage of full time master and doctoral students who received financial support.



J. Graduate Student Publications and Creative Activities – Number of discipline-related refereed papers/publications, juried creative/performance accomplishments, book chapters, books, and external presentations by Master and Doctoral students in the department.

DEPARTMENT WRITES

Publication:	Refereed		Non-Refereed		Poster presentations		Other activities	
Year	Thesis	Diss.	Thesis	Diss.	Thesis	Diss.	Thesis	Diss.
2009	5	22	0	1	0	0	1	0
2008	4	18	0	0	0	0	0	0
2007	5	13	1	1	0	0	1	1
2006	7	11	1	0	0	0	0	0
2005	5	10	0	0	0	0	0	2
2004	1	5	0	1	0	0	2	0

K. Programs for mentoring and professional preparation of graduate students

While there is no specific mentoring program for graduate students in Computer Science, the department does provide mentoring by thesis/dissertation committee members in the standard process of research and thesis/dissertation preparation. In addition, the department provides partial support for travel by graduate students to present their research at significant conferences throughout the year. The department also encourages students to take the ENGR 5393 – Ethics in Engineering Research, to prepare them to apply professional ethics in education and industry once they graduate.

The department supports all graduate Computer Science and Software Engineering majors in applying for co-op positions and internships during their course of study.

L. Department efforts to retain students and graduation rates.

Over the last several years, nationally the discipline of Computer Science has suffered a downturn in enrollment at all levels. We have seen it here at Texas Tech University as well, although it is not as obvious at the graduate level. Fall 2009 showed a 3% increase in enrollment from Fall 2009 overall, and Fall 2010 showed a 7% increase from Fall 2009. Conversely, there was a decrease in graduation rates from 2008/2009 to 2009/2010, by 23%. So far in 2010/2011, we have already graduated 26 students, and should show an uptick in graduation rates by the end of academic year 2011 as well. When considering the number of students who drop out of the program, the number that transfer from the program to another program and the number of new students, the department seems to be holding steady at about a 90% retention rate, losing roughly 10% of graduate students to transfers and dropouts each year. That rate dropped to 80% this fall, but we also had a 59% increase in new graduate students for Fall 2010, 6% of those transferred to other departments during the first semester.

Retention of graduate students is impacted by the time-to-degree and the amount of financial support they receive. Time-to-degree at both the master's and doctoral level has increased significantly since 2007. 2009 data indicates an MSCS degree is averaging 2.67 years, the MSSE degree is averaging 4.88 years, and the PhD is averaging 5.7 years. All of the time-to-degree trends are strongly upward since 2007. At the same time, financial support for doctoral candidates has declined or remained flat. Time-to-degree must be reduced back to 2007 levels or lower and more financial support though GPTI and RA appointments must be achieved to impact retention rates. Time-to-degree for the MSSE is impacted by the fact that most students are practicing professionals in the MSSE distance program and not full-time resident students. Most employers of students pursuing the MSSE cover the costs of education.

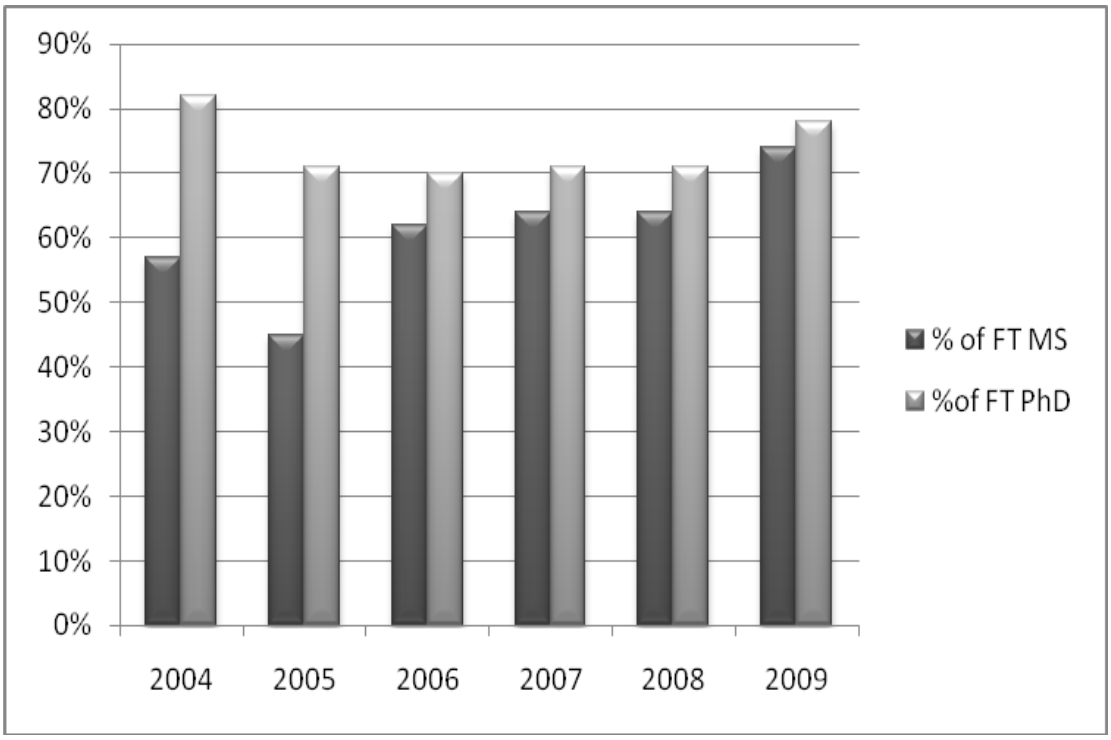
The Faculty Graduate Advisor in the last three years has published on the Department Web site (http://www.cs.ttu.edu/), schedules for completing degree requirements in a timely manner and has undertaken an advising program to counsel students each semester on their course registration. The schedules have helped students understand that if they wish to do a thesis, project, or report, then they must find a faculty advisor at certain critical time periods. For

example, all Ph.D. and thesis students must find a faculty advisor in their first semester of study so that they begin their research almost as soon as they are partially through their first semester of study. In addition, a Staff Graduate Advisor has been added to help with processing admission applications and counseling incoming students. All new students are given a new student packet which is reviewed with the student by the Staff or Faculty Graduate Advisor so students understand what they need to do to complete their degree requirements. In addition, all master's students and PhD students must submit a degree plan in their first semester of study so that they do not leave critical decisions to the point they have to stay extra semesters.

To help with retention, students must submit course registration forms so that the Faculty and Staff Graduate Advisors can review student progress on a semester-by-semester basis. In addition, course registration forms after the first semester may not be approved if a degree plan for the student is not in place.

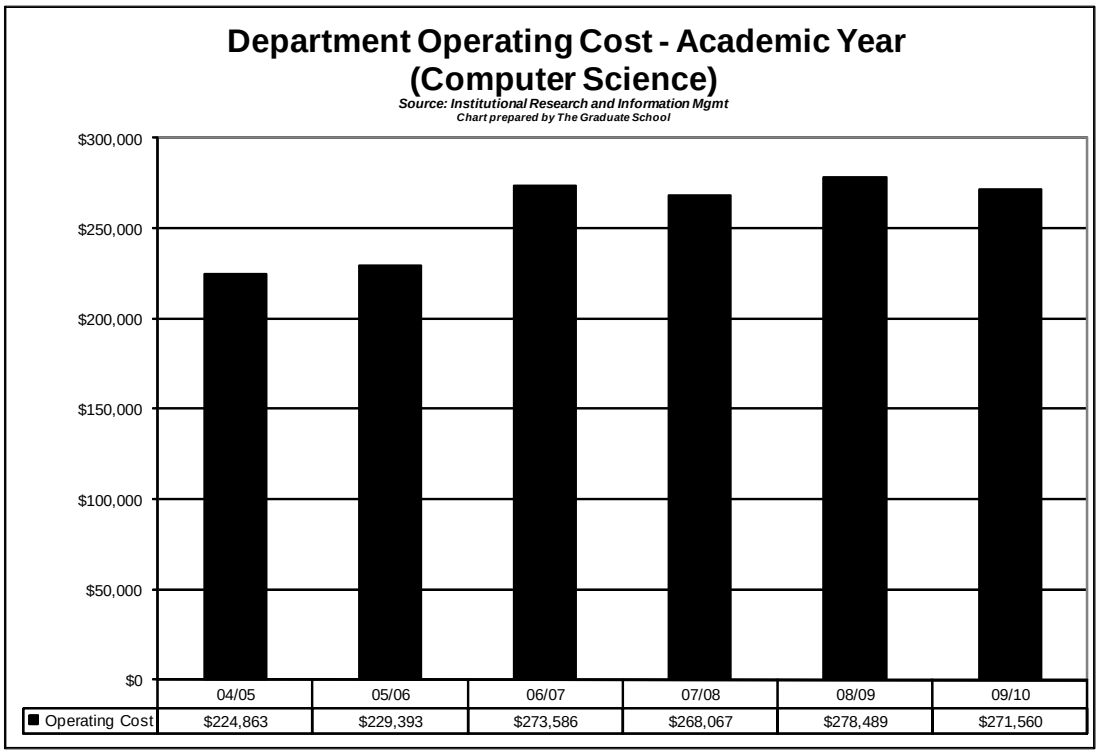
Retention issues stem from a lack of scholarship money to support students even with a scholarship to gain an out-of-state fee waiver. Also, some students enter only to find that a faculty member with whom they wished to work is no longer with the Department or is off on development leave, so, they transfer to another department where faculty in their area of interest are. Finally, some students enter with inadequate preparation in programming and computer science theory and must leave to avoid being suspended. A Graduate Admissions Committee was instituted in the last two years to deal with the third issue and the Department is looking for external funding to deal with the first issue.

M. Percentage of Full-Time Master and Doctoral students per semester – Fall Data



V. Department

A. Department operating expenses



Department Operating Costs as a Fraction of Employees

	04/05	05/06	06/07	07/08	08/09	09/10
Dept Operating Cost	$224,863	$229,393	$273,586	$268,067	$278,489	$271,560
Faculty & Staff	27	25	23	24	24	26
Dept Op Cost /FS	$8,328	$9,176	$11,895	$11,169	$11,604	$10,445

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
2009	0	0	0	1	22	9	5	0	10	2
2008	1	0	1	0	18	4	1	0	7	0
2007	3	0	0	0	5	3	4	1	2	3
2006	5	0	0	0	7	7	5	1	10	4
2005	1	0	0	0	9	5	4	0	4	2
2004	0	0	0	0	8	3	1	0	2	0

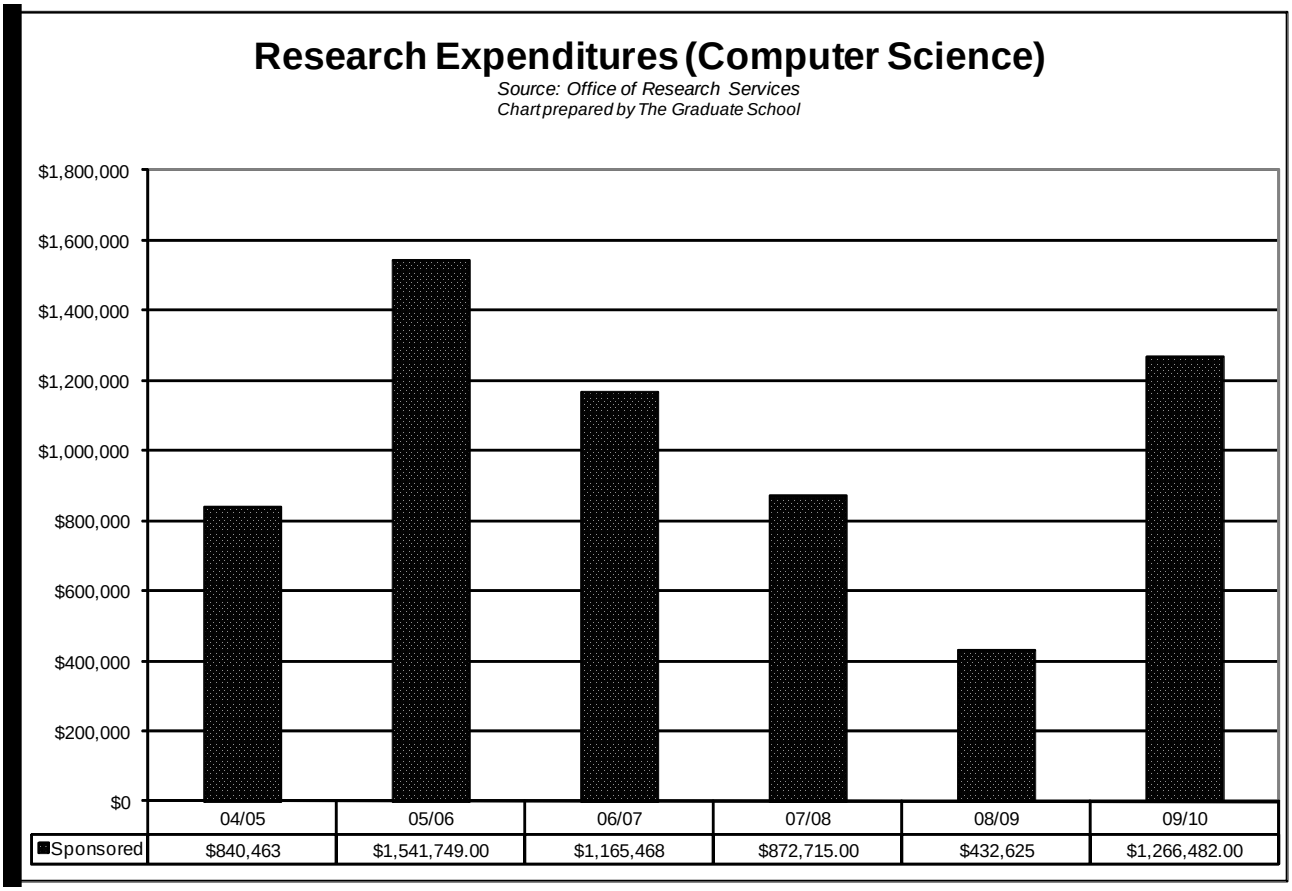
D = proposals written by CO-PI's from your department only
M = proposals written by CO-PI's from multiple departments

C. External Research expenditures

SUMMARY OF FACULTY AWARDS BY HOME DEPARTMENT

Source: Office of Research Services

Year	*Number of Awards*	*Facilities & Administrative*	*Award Amount*
04/05	***13.00***	***$140,370***	***$840,463***
05/06	***7.18***	***$430,256***	***$1,541,749***
06/07	***13.48***	***$232,847***	***$1,165,468***
07/08	***6.05***	***$187,870***	***$872,715***
08/09	***7.40***	***$81,552***	***$432,625***
09/10	***13.83***	***$260,156***	***$1,266,482***
Totals:	***60.94***	***$1,333,051***	***$6,119,502***



Comparison of Research Expenditures	04/05	05/06	06/07	07/08	08/09	09/10
Auburn University	$1,710,341	$1,426,610	$1,785,873	$1,951,908	$2,127,493	N/A
Colorado State University	$1,272,000	$1,350,000	$1,109,000	$1,015,000	$1,969,000	$2,272,000
Mississippi State University	$6,239,496	$4,983,267	$2,895,820	$2,327,511	$7,230,455	$9,085,574
University of North Texas	$89,257	$1,487,435	$1,015,428	$1,339,425	$813,357	$765,243
University of Texas - Arlington						
Texas Tech	$840,463	$1,541,749.00	$1,165,468	$872,715.00	$432,625	$1,266,482.00

D. Internal Funding

Source of Internal Funds (TTU)

	04/05	05/06	06/07	07/08	08/09	09/10
Research Enhancement	$75,000	$31,667	$32,002	0	0	0
Research Incentive	$41,000	$33,689	$87,857	$119,742	$118,869	$67,058
Line Items	0	0	0	0	0	0
Interdisciplinary Seed Grants	0	0	0	0	0	0
New Faculty Start-ups	$96,833	$15,000	$15,546	$111,332	$252,605	$96,317
Matching from VP of Research	0	0	0	0	0	
Special needs and opportunities	$250,000	$250,000	0	0	0	$40,000
Research Promotion	0	0	0	0	0	
Graduate School Travel Money *	n/a	n/a	$905	$950	$3,500	$650
Graduate School Fellowships	$6.000	$12,000	$12,825	$10,000	$14,000	$8,000
HEAF	$62,911	$53,276	$66,030	$45,062	$60,498	0
TOTALS:	***$531,744***	***$395,632***	***$215,165***	***$287,086***	***$449,472***	***$212,025***

- Graduate School Travel Money Records do not record by department before 06/07. Also, several students who traveled in 06/07 and 07/08 cannot at this time be connected to a department.

E. Scholarships and endowments

Scholarship Name	**Eligible Students**
General CS Scholarship Fund	Graduate and Undergraduate
ACM CS Scholarship	Graduate and Undergraduate
Graduate Tuition Scholarship Fund	Graduate
Computer Science Alumni Scholarship	Undergraduate
SPACE Scholarships in Computer Science	Undergraduate
Exxon Scholarship in Computer Science	Undergraduate
Toshiba Scholarship in Computer Science	Graduate
Tim Osmulski Scholarship in Computer Science	Undergraduate
Terry G Myers Endowed Scholarship in CS	Undergraduate
William M Marcy Endowed Scholarship	Undergraduate
Ruwaldt Computer Science Endowed Scholarship	Undergraduate
Zach Mullins Memorial Endowed Scholarship	Undergraduate
Weiner Endowed Scholarship	Undergraduate

All Graduate Tuition funds are used for graduate scholarships.

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

Type of Space	Number of Rooms	Total Assignable Square Feet
OFFICES:		
Faculty & Administration	24	4259
Clerical	5	1144
Graduate Assistant	0	0
Technician	3	762
Emeritus	0	0
LABS:		
Special Instruction Labs	3	3238
Research Labs	12	6313
STORAGE:	6	386
LIBRARY:	*0*	*0*
CENTERS & OTHER FACILITIES:		
Office		
Lab (Instruction & Research)		
Classrooms	3	1968
Conference Rooms	2	759
TOTAL SQUARE FEET		18,829

G. HEAF expenditures

	Labs	Classroom	Other (identify)	TOTAL
2009	0	$3,174	$41,503 – startup $12,943 - office	$57,620
2008	$21,904	0	$10,479 – startup $6,618 - faculty	$39,001
2007	$4,873	$4,718	$17,590 – faculty $31,894 - dept	$59,075
2006	0	0	$13,295 – startup $22,653 – faculty $21,641 - dept	$57,589
2005	$11,060	0	$10,887 – startup $7,271 – faculty $6,767 – office $24,025 - dept	$53,919
2004	$30,070	$1,912	$16,318 – startup $16,671 – faculty $4,687 – dept.	$69,658

H. External Program Accreditation – Name of body and date of last program accreditation review, if applicable. Include description of body and accreditation specifics.

While currently not accredited by an external agency, the department is planning on applying for probationary status with ABET in the coming year.

VI. Conclusions

Critical success factors for the Department of Computer Science are the following:

(1) Attract a larger number of domestic students to our graduate programs

(2) Reduce the time to degree at both the master's and doctoral level

(3) Increase the amount of research funding available to support doctoral level students

(4) Increase the visibility of the department both inside and outside the university.

(5) Leverage the Certificate in Software Engineering to attract practicing professionals to our graduate program.

The Department of Computer Science has added a number of young faculty since the last Graduate Program Review. These young faculty members are in various stages of the tenure and promotion cycle. Some are newly tenured, some are at the mid tenure review point and some are in their first year of appointment. All of them are research active. All CS faculty are encouraged to develop interdisciplinary linkages to research programs across the university and the Health Sciences Center. As a result the computer Science Department is making significant progress in growing extramural funding.

Enrollment is trending upward at both the undergraduate and graduate level levels in Computer Science. There is a shortage of computer science and software engineering graduates across the country. This is being driven not only by efforts to improve international competitiveness, but also by the growing realization that cyber security and cyber warfare are national security issues. The computer science graduate program is well equipped to provide our students with the education and skills necessary to take advantage of these career opportunities.

We are anxious to receive any and all comments that will help us achieve our vision and goals.

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

A. Strategic Plan
B. Graduate Course Offerings
C. Graduate Student Handbook
D. Graduate Student Association(s)
E. Graduate Faculty Information

APPENDIX A

Strategic Plan

Our departmental strategic plan is located at the following website:

http://www.cs.ttu.edu/dept/strategic_plan.php

APPENDIX B

Graduate Course Offerings

Our graduate course offerings are located at the following website:

http://www.depts.ttu.edu/officialpublications/courses/CS.php

See following three (3) pages for the **Texas Tech University Program Level – Curriculum map** for Computer Science.

Texas Tech University Program Level - Curriculum Map

LEGEND

[I] OUTCOME STATEMENT:

The program outcome is

(x) EXPLICITLY (score of 2) or (m) IMPLICITLY (score of 1) reflected in the course syllabus as being one of the learning outcomes for this course.

[II] LEVEL OF CONTENT DELIVERY:

(I) INTRODUCED - Students are not expected to be familiar with the content or skill at the collegiate level. Instruction and learning activities focus on basic knowledge, skills, and/or competencies and entry-level complexity. Only one (or a few) aspect of a complex program outcome is addressed in the given course (score of 1).

(R) REINFORCED- Students are expected to possess a basic level of knowledge and familiarity with the content or skills at the collegiate level. Instruction and learning activities concentrate on enhancing and strengthening knowledge, skills, and expanding complexity. Several aspects of the outcome are addressed in the given course, but these aspects are treated separately (score of 2).

(A) ADVANCED - Students are expected to possess a strong foundation in the knowledge, skill, or competency at the collegiate level. Instructional and learning activities continue to build upon previous competencies with increased complexity. All components of the outcome are addressed in the integrative contexts (score of 3).

[III] FEEDBACK ON STUDENT PERFORMANCE / ASSESSMENT:

(F) Students are asked to demonstrate their learning on the outcome through homework, projects, tests, etc. and are provided formal Feedback (score of 1).

Date 12/8/2010

SELECTED *PROGRAM LEARNING OUTCOMES*

MS in Computer Science	1 Communicate effectively orally and in writing			2 Engage in life-long learning and self critique			3 Have good computer science skills including modeling, mathematical and experimental anlysis and programming			4 Function independently on self directed projects or research where appropriate			5 Graduates are expected to have a resonably broad knowledge of computer science		
Courses in Degree Program	Outcome Statement (X, M)	Level (I, R, A)	Feedback (F)	Outcome Statement (X, M)	Level (I, R, A)	Feedback (F)	Outcome Statement (X, M)	Level (I, R, A)	Feedback (F)	Outcome Statement (X, M)	Level (I, R, A)	Feedback (F)	Outcome Statement (X, M)	Level (I, R, A)	Feedback (F)
CS 5301	X	I	F	M	I	F	X	I	F	X	I	F	X	I	F
CS 5302	M	I	F	M	I	F	X	I	F	X	I	F	X	I	F
CS 5303	M	I	F	M	I	F	X	I	F	X	I	F	X	I	F
CS 5320	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5331	X	I	F	X	I	F	X	I	F	X	I	F	X	I	F
CS 5332	X	I	F	X	I	F	X	I	F	X	I	F	X	I	F
CS 5341	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5352	X	A	F	X	A	F	X	A	F	X	A	F	X	A	F
CS 5353	M	I	F	M	I	F	X	I	F	M	I	F	X	I	F
CS 5355	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5356	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5357	M	R	F	M	R	F	X	R	F	X	A	F	X	R	F
CS 5361	X	R	F	M	R	F	X	R	F	M	R	F	X	R	F
CS 5363	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5365	X	I	F	X	I	F	X	R	F	X	R	F	X	R	F
CS 5368	X	R	F	X	R	F	M	R	F	X	R	F	M	R	F
CS 5369	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5373	X	R	F	X	R	F	M	R	F	X	R	F	M	R	F
CS 5374	X	R	F	X	R	F	M	R	F	X	R	F	M	R	F
CS 5375	X	R		X	R	F	M	R	F	X	R	F	M	R	F
CS 5376	X	A	F	X	A	F	M	A	F	X	A	F	M	A	F
CS 5377	X	R	F	X	R	F	M	R	F	X	R	F	X	R	F
CS 5379	X	A	F	X	A	F	X	A	F	X	A	F	X	A	F
CS 5380	M	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5381	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5383	X	R	F	X	R	F	X	R	F	X	R	F	X	R	F
CS 5384	X	R	F	M	R	F	X	A	F	M	R	F	X	A	F
CS 5388	X	A	F	X	A	F	X	A	F	X	A	F	X	A	F
CS 5391	X	R	F	X	R	F	M	R	F	X	A	F	M	R	F
CS 5392	X	A	F	X	A	F	X	A	F	X	A	F	X	A	F

APPENDIX C

Graduate Student Handbook

Our graduate student handbook is in the process of being revised. Currently graduate students in Computer Science can refer to the following website for detailed information:

http://www.cs.ttu.edu/grad/overview.php

APPENDIX D

Graduate Student Associations(s)

Our department does not have a separate Graduate Student Association, however, CS graduate students are encouraged and actively participate in the Associate for Computing Machinery, the professional student organization for Computer Scientists.

APPENDIX E

Graduate Faculty Information