Program Review and Assessment of the Master of Science Degree in Computer Science 2002 – 2007

Prepared by the Graduate Faculty Department of Computer Science January, 2008
Foreword

This review of the Master of Science in Computer Science has been conducted by the graduate faculty of the Department of Computer Science in accordance with the Program Review Process outline distributed by the Dean of Graduate Studies and in consultation with the Dean of the College of Science and Mathematics. The period covered by the review includes the five academic years beginning in the Fall, 2002 through Summer II, 2006.

A special note of appreciation is extended to the staff of the Midwestern State University Institute for Research and Planning whose diligent efforts and timely reporting were extremely valuable in the compilation of the data contained in this report.
Table of Contents

Section 1: Program Overview
Section 2: Programmatic Climate
Section 3: Students
Section 4: Financial Support for Graduate Students
Section 5: Student Achievement
Section 6: Graduate Faculty
Section 7: Graduate Curriculum
Section 8: Program Support
Section 9: External Relationships
Section 10: Overall Program Assessment
Section 11: Action Plan

Tables & Figures

Figure 1.1: Reporting Paths for the M.S. Program in Computer Science.
Table 1.1: Relationship of Goals & Objectives to the Mission of the Program.
Table 1.2: Achievement of Goals and Objectives.
Table 1.3: Department of Computer Science Laboratories.
Table 3.1: Head count of Computer Science Students by Ethnicity.
Table 3.2: Head Count of Computer Science Majors by Place of Origin.
Table 3.3: Number of Students Applying and Admitted.
Table 3.4: Years to Complete Degree.
Table 4.1: Program and Institutional Funds Expended.
Table 4.2: Financial Aid (grants and loans) awarded – 2002-2005.
Table 4.3: Graduate Assistantships.
Table 4.4: Graduate Merit Scholarships.
Table 4.5: Count of Graduate Merit Scholarship Recipients.
Table 7.1: Course Enrollments and Frequency of Offerings.
Table 8.1: Department Budget.
Table 10.1: Results of Alumnae Questionnaire – Fall 2006.

Appendices

Appendix 1: University Graduate Admission Requirements
Appendix 2: Department of Computer Science Admission Criteria
Appendix 3: Graduate Student Achievement
Appendix 4: Graduate Faculty
Appendix 5: Student Course and Lecture Teaching Evaluation
Appendix 6: Student Evaluation of Instruction – Lecture/Seminar
Appendix 7: Department Graduate Exit Survey
Appendix 8: Alumnae Questionnaire
Appendix 9: Master of Science Improvement Plan
1. Program Overview

a. Organizational Chart

Figure 1.1 shows the organization of the University with respect to the Department of Computer Science and the graduate program in Computer Science.

b. Mission Statement

The mission of the Master of Science degree in Computer Science is to provide a source of knowledge to experienced information technology professionals, an advancement of knowledge to recent graduates of computer science programs, and the opportunity for career change to those with undergraduate preparation in fields other than computing. The degree is to provide classroom, laboratory, and discovery experiences which emphasize the theory, application, and contemporary research in the computing sciences.

c. Purpose, Goals, and Objectives

The purpose of the Computer Science Program at Midwestern State University is to provide all interested students with an in-depth educational experience in the computing sciences which emphasizes the theory, research, and application of computing.

The goals and objectives of the program are intended to:

G1. Provide students with an in-depth understanding of computer software and hardware and the techniques for the design, implementation, maintenance and uses of it;
O1. Demonstrate a knowledge of, and ability to use, current terminology, concepts and technology in the computer field;
O2. Analyze a problem, explore and design alternative solutions to the problem, and implement and verify a solution, using state-of-practice techniques;
O3. Generate appropriate documentation for a problem and its solution;
G2. Prepare students to be qualified and capable of functioning as professional computer scientists in the workplace;
O1. Present in oral and written form a discussion of a problem and its solution;
O2. Prepare students to interact effectively in cooperative teams;
G3. Provide a foundation for continuing education and growth in the field of computing, including doctoral-level course work;
O1. Develop theoretical and analytical maturity necessary to allow students to adapt to changing requirements in the job market or enter doctoral programs in computer science;
O2. Prepare students to research, understand, and interpret written material related to the computing field;
G4. Prepare computing professionals who are socially and professionally aware of the impact of computing in today’s society.
O1. Demonstrate an awareness of the interdisciplinary connections of computer science;
O2. Demonstrate an awareness of ethical issues and societal responsibilities relating to the computers in society.

Table 1.1 illustrates how these goals and their objectives support the mission of the program.

Table 1.1. Relationship of Goals and Objectives to the Mission of the Program.

<table>
<thead>
<tr>
<th>From Mission Statement</th>
<th>Goals and Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide knowledge to prepare students for work</td>
<td>G1(O1-O3), G2(O1, O2)</td>
</tr>
<tr>
<td>Provide knowledge to prepare students for graduate work</td>
<td>G1(O1-O3), G2(O1-O2), G3(O1,O2)</td>
</tr>
<tr>
<td>Provide classroom, laboratory, experiences which emphasize theory, application and research in the computing sciences</td>
<td>G1(O1-O3), G3(O1, O3)</td>
</tr>
<tr>
<td>Provide experiences which emphasize application of computing sciences</td>
<td>G4(O1)</td>
</tr>
<tr>
<td>Supported by societal awareness</td>
<td>G4(O1,O2), G2(O1)</td>
</tr>
</tbody>
</table>

Table 1.2. Achievement of Goals and Objectives.

<table>
<thead>
<tr>
<th>Goal / Objective</th>
<th>Context of Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1: (O1, O2, O3)</td>
<td>Core Courses (CMPS 5133, 5133, 5143, 5153, 5243)</td>
</tr>
<tr>
<td>G2: O1</td>
<td>File Paper, term papers within courses (e.g., CMPS 5303)</td>
</tr>
<tr>
<td>G2: O2</td>
<td>CMPS 5153, CMPS 5353</td>
</tr>
<tr>
<td>G3: (O1, O2)</td>
<td>File Paper, Independent Study, CMPS 5243, CMPS 5313</td>
</tr>
<tr>
<td>G4: (O1, O2)</td>
<td>Continual</td>
</tr>
</tbody>
</table>
These goals and objectives are measurable and the time required to achieve them is reasonable. Table 1.2 presents the programmatic context in which the goals and objectives can be satisfied. While some goals and objectives are associated with specific curricular offerings and requirements (e.g., G1 and G2), others are achieved through the total educational experience comprising the 36-hour degree program.

d. History of the Program

Initially, course offerings consisted of traditional topics that included programming language concepts, operating systems, computer architecture, data structures, database systems, compiler theory, numerical analysis, and discrete system simulation. Curricular offerings have evolved to include, along with other topics, courses in interactive computer graphics, parallel computation, algorithm analysis, automata theory, wireless networking, and artificial intelligence.

1) Students. Benefitting from the rising popularity of computing as an academic field, the master’s degree program began with approximately 40 students, about 20 of whom were employed as graduate assistants (most on a half-time appointment). The Master of Science degree in Computer Science was approved in 1982 and began classes in September of that year. Designed as an “entry-level” program, the degree allowed students possessing at least a bachelor’s degree in any discipline awarded by a regionally accredited university or international students with a degree deemed to be equivalent to a corresponding U.S. degree to apply for admission. Those deemed deficient in mathematics and/or the fundamentals of computing were required to complete specified courses in order to enroll in graduate courses. All applicants were required to take the Graduate Record Examination. An index computed from the GRE scores and the applicant’s grade point average on the last 60 hours of undergraduate course work was used to determine admission status.

The degree required that students complete 36 credit hours of course work of which at least 30 must be in computer science (a six hour minor in a different discipline was originally allowed but has subsequently been deleted). A file paper conforming in format to a professional computing publication (the Communications of the ACM format has been used for most papers) was required of all candidates for the degree. The degree requirements have continued unchanged through the Fall 2007 semester.

Traditionally, the program has relied on the international community to provide the majority of students in the program. Initially, students from Taiwan made up the most significant group. Students from India soon represented the largest group and continue to be a significant subset of the program’s enrollments. Over the 25 years of the program, more than 150 candidates have earned the degree.

The trend in applications and admissions since 2001 has been steadily in decline to the point where the headcount of students in the program is now in the low 20s.

2) Faculty. The faculty, which began with four full-time faculty members, one possessing the Ph.D., has grown to eight. Of the eight, four have the Ph.D. in computer science, one has the Ph.D. in mathematics, two have completed all but the dissertation in computer science, and one holds a Master’s degree in management and has completed 12 hours toward the Ph.D. in information systems. The faculty has been exceptionally stable, with three of the four original faculty still full time with the department (each having more than 28 years of service) a fourth completing his 21st year, one having completed 12 years and another 5 years. The current faculty includes:

Dr. Stewart B. Carpenter     Professor and Graduate Coordinator, Ph.D., Computer Science, Texas A&M University
Dr. Timothy Donovan         Professor, Ph.D., Mathematics,
The faculty has a strong record of publications and presentations as indicated in Section 6 and Appendix 4 of this report.

The department employs one faculty member who teaches and coordinates the computer science service course. This position frees the graduate faculty from this course for much of the time allowing for more time to be spent on the graduate courses and graduate students.

3) Hardware and Software Support. Computer facilities in support of the computer science M.S. degree have also evolved, beginning with reliance on an IBM 370/125 running a time-sharing environment that served 12 online terminals. Over time the “mainframe” was abandoned in favor of personal computers. The department now has more than 40 work stations running either the Windows XP or the Linux operating system. All stations are connected through the University’s network except for the Linux system which is operated as a departmental local area network. All have internet access. In addition, the department has a variety of specialty equipment dedicated to specific courses or research projects, including two Alien computers with dual, wide-screen monitors for graphics and a small cluster for parallel processing.

e. Program Strengths

1) Faculty. The Department of Computer Science boasts a stable faculty with strong academic credentials comprised of five full professors who have Ph.D.s (four in computer science, one in mathematics), one assistant professor who is A.B.D. in computer science, one instructor who is A.B.D. in computer science, and one instructor who holds a Masters degree in management. The average length of service at Midwestern of the tenured faculty is approximately 23 years.

With a commitment to student success, the faculty practices an open-door policy with students, each being available to student requests for assistance without prior appointment. They work closely with students on research which is meaningful and challenging and which often results in publications and presentations. Over the past five years 27 peer-reviewed papers authored in whole or in part by 19 graduate students under the direction of the faculty have been published in regional, national or international journals and 30 presentations have been made by 26 students at regional, national, or international conferences (see Appendix 3).

2) Curriculum. The curriculum of the M.S. degree in computer science is designed to provide an educational experience that builds a strong theoretical foundation in computing while developing the student’s technical abilities. To this end students pursuing the degree must complete 36 credit hours of
course work consisting of a 15 credit-hour core and 21 hours of elective credit. Each candidate must write a file paper that meets stringent requirements of content and format. A comprehensive oral examination is administered to each prospective graduate.

a) **Core Requirements.** The 15 credit-hour core is required of all students and encompasses courses which in the faculty’s consideration contain information that is fundamental to the knowledge of anyone seeking employment in the computing sciences or who desires to pursue further education at the doctoral level. The core consists of courses that address the hardware (CMPS 5143 Advanced Computer Architecture), software concepts (CMPS 5143 Advanced Operating Systems and CMPS 5113 Programming Language Concepts), theory (CMPS 5243 Algorithm Analysis), and software development (CMPS 5153 Advanced Software Engineering).

b) **Electives.** By selecting appropriate elective courses, students can pursue an emphasis to provide a depth of knowledge in a particular area. Examples of these include:

- An emphasis in the areas of computer architecture and organization;
  Courses – CMPS 5133 Advanced Computer Architecture; CMPS 5203 Embedded Systems; and CMPS 5213 Wireless Computer Communications and Networks
- An emphasis in software development;
  Courses – CMPS 5303 Advanced Database Management Systems; CMPS 5223 Language Translators and Interpreters; CMPS 5113 Advanced Programming Language Concepts, CMPS 5153 Advanced Software Engineering; and CMPS 5433 Topics in Parallel and Distributed Computing
- An emphasis in artificial intelligence

In addition to the ability to pursue tracks of emphasis in the discipline, the department offers courses in which the topic changes from year-to-year. These courses permit the introduction of topics which are new and often cutting-edge in content. Some of these are ultimately incorporated into the curriculum as elective courses.

3) **Resources**

   a) **Library.** Moffett Library maintains a substantial number of print and electronic resources which are available to faculty and staff performing research in various areas of computing. This includes a significant number of recent books and textbooks, journals, conference proceedings, and electronic volumes (VHS, CD, DVD).

   The Department of Computer Science is allotted an annual budget of $3800.00, which is spent in augmenting the current collection of books and electronic volumes. Additionally, the library maintains subscriptions to a number of databases which are available by way of the Internet. The department supplements the library support with a departmental subscription to the ACM Digital Library to which all faculty and graduate students have access.

   b) **Hardware.** The Department of Computer Science has adequate computers and supporting hardware to carry out its mission effectively. Currently, the department has six laboratories of computers dedicated to computer science activities. In addition it has access to two additional laboratories used in teaching two computer literacy courses (CMPS 1023 Introduction to Computing and
CMPS 2153 Microcomputer Applications for Business). Table 1.3 summarizes the departmental laboratory resources.

The faculty is also well-supported with office hardware. Each faculty member selects his/her equipment which is supplied by the university.

c) **Software.** All PCs except the Linux servers run the Windows XP operating system and a full complement of compilers, system utilities, and productivity software (MS Office) is available to faculty and students in the laboratories. Software is upgraded periodically as agreed upon by the computer science department and the information technology support staff.

Students have access to most software installed in the departmental laboratories through a license agreement with Microsoft that permits them to install the software on their personal computers for the purpose of educational activities. Software products currently available include Windows XP, Visual Studio Professional 2005, and Visual C++ Version 6.

Software supporting specialized courses such as graphics, database management systems, artificial intelligence, discrete system simulation, software engineering, embedded systems, programming language concepts, and operating systems can be found on either the Windows-based systems or the Linux-based system. A large inventory of software is available on the two Linux platforms.

d) **Technical System Support.** Hardware and software support are provided by the university’s Information Systems Department. They are responsible for repair and replacement of hardware elements and for maintaining the software environment at a current level of upgrades. The exception to this is the maintenance of the two Linux servers which is administered by the Department of Computer Science.

Hardware resources such as PCs and supporting peripherals are replaced on a three-year cycle. Software such as operating systems, compilers, and productivity software (word processors, spreadsheet programs, presentation software, etc.) are replaced as newer versions are released and deemed stable enough for use in the program. Specialized software is installed at the request of computer science faculty and is maintained by the Information Systems staff as necessary.

Technical staff of the Information Systems Department assists the Department of Computer Science in identifying and configuring hardware and software specifications for the acquisition of faculty computer systems and systems to be integrated into the laboratory facilities of the Department of Computer Science.

e) **Students.** The students pursuing the M.S. degree in computer science are an internationally diverse group with undergraduate preparation in a variety of fields. Asian students have been numerically predominant throughout the history of the program. Representatives from eight Asian countries, four Eastern European countries, three European countries, two Latin American countries, several South American countries, and numerous Caribbean countries as well as many U.S. citizens have received the M.S. degree from Midwestern.

Academic preparations of those accepted into the program include degrees in various engineering disciplines, computer science, mathematics, pharmacy, history, English, psychology, medicine, electronics, technology, and education.
Table 1.3. Department of Computer Science Computer Laboratories.

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Number and Type of Workstations</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Computer Science Laboratory</td>
<td>20 PCs, Windows XP Professional O.S.</td>
</tr>
<tr>
<td>Networking Laboratory</td>
<td>6 PCs, Windows XP Professional O.S.</td>
</tr>
<tr>
<td>Graphics Laboratory</td>
<td>8 dual-screen graphics workstations; 2 Alienware graphics workstations with 24-inch monitors Windows XP Professional O.S.</td>
</tr>
<tr>
<td>Linux Laboratory</td>
<td>2 large workstations configured as Linux servers (cs.mwsu.edu and cs2.mwsu.edu)</td>
</tr>
<tr>
<td>Computer Literacy Laboratory</td>
<td>23 PCs, Windows XP Professional O.S.</td>
</tr>
<tr>
<td>Computer Cluster</td>
<td>4 PCs, Windows XP Professional O.S.</td>
</tr>
<tr>
<td>Reserve</td>
<td>10 PCs</td>
</tr>
</tbody>
</table>
2. Programmatic Climate

   a. Student/Faculty Satisfaction with the Scholarly Community

There are a number of research groups currently active within the computer science department faculty. Some feature interaction with other departments within the university; most have student involvement. Some examples of these collaborations follow. The GRAPHX group is currently working on a puzzle solving algorithm to be used potentially for the reconstruction of archeological artifacts with a minimum of contact. The parallel processing group is considering the problem of hierarchical parallelization. The Beetle data mining group is collaborating with the biology department on the likelihood that certain beetles will appear in a given ecology. The GPS prediction group is attempting to predict future activity based on previous activity and a progression of GPS coordinates.

   b. Quality of Academic Advising

All advising of graduate students is accomplished by one adviser. He is the coordinator of the graduate program. He is responsible for making the students aware of the requirements. There have been no cases of serious misadvising. Other graduate faculty members interact with the graduate students to discuss job and resume assistance, research support and a variety of other matters as deemed necessary.

   c. Activities to Promote Esprit de Corps

There are several groups/activities to help students feel that they are an important part of the department. There is a local student chapter of the Association for Computing Machinery (ACM). This organization sponsors, in whole or in part, the following activities: monthly pizza meetings with presentations, a fall softball game and picnic, a Halloween costume party, and a spring barbeque and honors banquet. There is also a local chapter of UPE, the national computer science honor society. The department co-sponsors an annual conference for student papers, NTASC (North Texas Area Student Conference). Students take an active role in putting on the conference as well as presenting papers.

The university sponsors an annual major’s fair and career fair and computer science graduate students are encouraged to take part in both of these.

   d. Critical Mass of Faculty and Students

The program has sufficient faculty numerically for the number of graduate students currently in the program. With six graduate faculty and four courses taught per long term, the graduate faculty rotate through the teaching cycle for graduate courses. For a small faculty, the diversity in specialties is generally sufficient to teach the necessary courses. However, with low turnover, the current faculty must often spend a great deal of time in study to offer leading edge courses.

The program does not have the desired number of graduate students. There are often too few students to maintain the program in terms of minimum required course enrollments and certainly not enough for important elective courses to thrive. MSU, unfortunately, is following the national trend of declining enrollments in computer science and other computer-based disciplines. A committee was formed in the past year and made several positive actions toward recruiting additional graduate students.

Currently graduate students may no longer take upper division undergraduate courses for graduate credit. The courses that they were allowed to take do not have a graduate course equivalent. They
provided important opportunities for allowing students to broaden their experience. This has been a casualty of the small number of graduate students. The department is studying ways to improve recruitment.

e. Activities Related to Promoting Diversity Among Students and Faculty

The graduate student population is diverse. Enrollments include women, Indians, Africans, and Caribbean Islanders. The faculty is somewhat diverse. It consists of 3 women and 5 men, with one Hispanic faculty member. Recruitment has always been inclusive. Prospective faculty members of all ethnic groups are encouraged to apply and are given every consideration.

f. Special Lectures, Seminars, and Other Program Enhancements

There are many opportunities for learning outside of the classroom. The ACM often has a guest lecturer during their monthly meetings. The department has sponsored an average of one ex-student seminar per year. Former students are invited to campus to discuss their education and career with the current students. Past speakers include employees of Infragistics (NJ), Raytheon (Dallas), IBM (Dallas) and Clinics of North Texas (Wichita Falls). The College of Science and Mathematics, of which computer science is a part, has monthly seminars featuring the research of different departments. Students are encouraged to attend these presentations. NTASC schedules a keynote speaker annually who is a successful practitioner in the computer science field. NTASC also provides the opportunity for students to hear the papers of their peers from MSU and other universities.

In addition, MSU provides a number of free campus-wide activities throughout the year. Many of these programs are directly applicable to the graduate computer science students and they are encouraged to attend.

   g. Collaboration with Other Entities

The department regularly shares faculty with the Department of Mathematics. The two departments have a symbiotic relationship. The faculty has also collaborated with the Departments of Mathematics, Physics and Biology on several research projects. The MIS department of the College of Business Administration cosponsors the NTASC conference annually. The department has had a very good relationship with the software arm of Stanley Corporation in Lawton, Oklahoma. Stanley has sent representatives to MSU to meet with students and to recruit students from the department. There are several MSU computer science graduates in their employ. The cohort of students usually includes some who are stationed at Sheppard Air Force Base. There is a working relationship between the department and the Departments of Computer Science at Cameron University (Lawton, Oklahoma), the University of North Texas (Denton, Texas), the University of Oklahoma (Norman) the University of Texas at Dallas and the University of Texas at Arlington.
3. Students

a. Number and Characteristics of Students

Table 3.1 shows the number of students in each year by ethnic origin by head count and as a percentage. The distribution of students’ places of origin is shown in Table 3.2.

<table>
<thead>
<tr>
<th>Table 3.1. Head Count of Computer Science Majors by Ethnicity.*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
</tr>
<tr>
<td>White, Non-Hispanic</td>
</tr>
<tr>
<td>Black, Non-Hispanic</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
</tr>
<tr>
<td>Not Reported by Student</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

| **Percent** | Fall, 2002 | Fall, 2003 | Fall, 2004 | Fall, 2005 | Fall, 2006 |
| White, Non-Hispanic | 35% | 39% | 41% | 48% | 29% |
| Black, Non-Hispanic | 0% | 0% | 4% | 0% | 0% |
| Hispanic | 0% | 0% | 7% | 4% | 0% |
| Asian or Pacific Islander | 13% | 13% | 11% | 13% | 24% |
| Non-Resident Alien | 52% | 48% | 37% | 35% | 41% |
| Not Reported by Student | 0% | 0% | 0% | 0% | 6% |
| **Total** | 100% | 100% | 100% | 100% | 100% |

* Midwestern State University Department of Institutional Research and Planning

<table>
<thead>
<tr>
<th>Table 3.2. Head Count of Computer Science Majors by Place of Origin.*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
</tr>
<tr>
<td>Fall, 2002</td>
</tr>
<tr>
<td>Fall, 2003</td>
</tr>
<tr>
<td>Fall, 2004</td>
</tr>
<tr>
<td>Fall, 2005</td>
</tr>
<tr>
<td>Fall, 2006</td>
</tr>
</tbody>
</table>

| **Percent** | In-state | Out-of-state | International |
| Fall, 2002 | 39% | 48% | 56% |
| Fall, 2003 | 48% | 7% | 37% |
| Fall, 2004 | 56% | 9% | 35% |
| Fall, 2005 | 57% | 9% | 35% |
| Fall, 2006 | 47% | 12% | 41% |

* Midwestern State University Department of Institutional Research and Planning

b. Admissions Requirements

1) University Requirements. Admission to the M.S. degree in Computer Science is in accordance with the university guidelines as stated on pages 20 and 21 of the Midwestern State University Graduate Catalog, Volume LXXVI, Number 2, 2006 – 2008. The policy is given in Appendix 1.
2) Department of Computer Science Admission Requirements. The Department of Computer Science levies additional requirements for admission to the Computer Science degree as indicated on page 182 of the graduate catalog. The additional requirements are given in Appendix 2.

c. Student Recruitment

During the period of 2002-2006 the department utilized four avenues to advertise its graduate program. These include admissions department school visits; a profile in the Guide to Graduate Engineering and Computer Science Programs in the USA; posters to departments at Midwestern and to other universities; and word-of-mouth propagated by current and former students of the master’s program.

1) School Visits. The recruiting efforts of the Midwestern State University Admissions Department focus primarily on undergraduate admissions. However, advertising materials relating to the M.S. degree in the form of fliers containing information regarding curriculum, graduate assistantships, scholarships, and job opportunities are provided by the department to the recruiters for dissemination as part of their activities.

2) Guide to Graduate Engineering and Computer Science Programs in the USA. The program has subscribed to the guide since 2003 with a minimal profile. The guide provides potential applicants with information online and in a published paper-based catalog. This has been the most successful of the advertising approaches, averaging 26 inquiries per year (2003 – 3; 2004 – 16; 2005 – 38; 2006 – 46). However, no student among those inquiring about the program has applied for admission. The annual subscription rate of $495.00 makes the guide a valuable recruiting tool if as many as one student per year is admitted.

3) Posters. Recruiting posters with a return post card were developed and distributed to locations where potential candidates might be found. Locally, academic departments on the campus Midwestern were primary sites at which posters were displayed, as was the education office at Sheppard AFB. Fifteen posters were mailed to universities in Texas and Oklahoma, providing information on the graduate program.

4) Word-of-Mouth. By far the most effective recruiting has resulted from information exchanged among present or past students of the program and potential applicants. This has been especially true in recruiting students from India. As many as 75 of the program’s students who are from India were recruited as a result of information originating with a current or previous student of the program. Recruitment of Midwestern State University students has been steady (most from the undergraduate computer science program), but the numbers have been small, averaging one student per year.

d. Number of Applicants, Number and Percent Admitted and Matriculants

Table 3.3 shows the number of students who applied for admission and the number admitted. Data for the academic years 2002 and 2003 are not available.

<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied</td>
<td>------</td>
<td>------</td>
<td>8</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Admitted</td>
<td>------</td>
<td>------</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

* Midwestern State University Department of Institutional Research and Planning.
e. Number of degrees awarded per year and average time to degree.

Students enrolling in the master’s program as full-time students can complete the program in two years. The 36 hour requirement can be met with an enrollment of nine hours each long term (fall and spring) or by enrolling in six hours each long term and six hours each of two summers. Many of the students at MSU complete the program on a part-time basis. Table 3.4 shows the number of years required by students to receive the M.S. degree.

<table>
<thead>
<tr>
<th>Years</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.4</td>
</tr>
<tr>
<td>Median</td>
<td>2.9</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.2</td>
</tr>
<tr>
<td>Maximum</td>
<td>7.3</td>
</tr>
</tbody>
</table>

* Midwestern State University
  Department of Institutional Research and Planning.

f. Student Outcomes

1) Placement statistics. No formal statistics are available regarding job placement of the graduates of the M.S. program in computer science. Information obtained by the department informally (personal correspondence between faculty and graduates and e-mail), indicate that graduates obtain employment or admission to doctoral programs in a period of no more than a few months, with many accepting positions prior to graduation.

2) Student program evaluation. Two instruments are used to acquire feedback from students of the program. Students provide an evaluation of the course and the instructor at the end of each semester. The Student Course and Lecture Teaching Evaluation (see Appendix 5) was used for a number of years. Recently the form was changed and the current evaluation form, Student Evaluation of Instruction – Lecture/Seminar, is shown in Appendix 6. The Computer Science Exit Survey is required of each student at the time they take their oral examination (see Appendix 7).

3) Student Awards, Presentations, Publications, and Fellowships. See Section 5. Student Achievement, for a summary of graduate student achievements. A comprehensive listing of these can be found in Appendix 3.
4. Financial Support for Graduate Students

a. Program and Institutional Funds

Table 4.1 shows the contribution of institutional funds to the support of graduate assistants in computer science for the years 2002 – 2006. The majority of funding for graduate students is provided through institutional funds, either through stipends for graduate assistantships or graduate merit scholarships.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Assistantships</td>
<td>$62,880.00</td>
<td>$56,000.00</td>
<td>$53,300.00</td>
<td>$62,000.00</td>
</tr>
<tr>
<td>Graduate Merit Scholarships</td>
<td>$15,500.00</td>
<td>$16,000.00</td>
<td>$13,000.00</td>
<td>$14,000.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$78,380.00</td>
<td>$72,000.00</td>
<td>$66,300.00</td>
<td>$76,000.00</td>
</tr>
</tbody>
</table>

*Student Personnel Transaction Forms

b. Percent of Students on Financial Aid

Financial aid in the form of scholarships, grants, loans, and tuition waivers contributed substantially to the financial support received by students during the review period. Table 4.2 is a list of all financial aid other than graduate assistantships received by graduate students during the period of 2002 – 2005. Of the 75 unduplicated number of graduate students with a declared major of Computer Science from Fall, 2002 through Summer II 2007, 55 students received financial assistance other than scholarships and graduate assistantships. (MSU Department of Institutional Research and Planning.)

c. Average Level of Support

The average level of financial support (excluding scholarships and graduate assistantships) for students with a declared major of Computer Science from Fall, 2002 through Summer II, 2007, was $7,344. (MSU Department of Institutional Research and Planning.)

d. Ratio of Grant Funds to Loan Funds

The ratio of grant-to-loan aid awarded to graduate students with a declared major in Computer Science for the fiscal years 2002 – 2007 is $13,561.00 : $161,011.00 (0.084:1). (MSU Department of Institutional Research and Planning.)

e. Scholarships and Graduate Assistantships

1) Assistantships. Table 4.3 summarizes the number of graduate assistantships over the period of 2002 – 2006 and shows the funding for stipends during the same period.

Stipends for full-time graduate assistants (requiring a 19-hour work week) were limited to $6000.00 for the nine-month academic year (September through May). Summer appointments were awarded if funds were available and amounted to approximately $1000.00 for a 10-week period. Until 2004, partial assistantships were awarded. These were typically for a 10-hour work week and amounted to $3000.00 for the academic year. Since the 2004-2005 academic year, full-time stipends have been awarded. The amount of the stipends was increased from $6000.00 to $7500.00 in the 2006 – 2007 academic year.
Table 4.2. Financial Aid (grants and loans) Awarded – 2002 - 2005.*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive Tuition Waiver</td>
<td>50</td>
<td>22.1</td>
<td>52</td>
<td>23</td>
<td>10</td>
<td>4.4</td>
<td>7</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazelwood Exempt</td>
<td>7</td>
<td>3.1</td>
<td>5</td>
<td>2.2</td>
<td>1</td>
<td>0.4</td>
<td>1</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military Waiver</td>
<td>1</td>
<td>0.4</td>
<td>2</td>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUS Non-Resident Waiver</td>
<td>1</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TPEG-Resident Grant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TPEG International (Non-Res) Grant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidized Stafford Loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>36</td>
<td>15.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsubsidized Stafford Loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>8.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exempt - Medical Service Fee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSU Tuition Grant -- Graduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off-Campus Stdt Union Ctr --Waiver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Randolph AFB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheppard AFB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wellness Center Fee Waiver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Midwestern State University Department of Institutional Research and Planning.

Table 4.3. Graduate Assistantships.¹

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall No.</th>
<th>Amount</th>
<th>Spring No.</th>
<th>Amount</th>
<th>Summer No.</th>
<th>Amount</th>
<th>Totals No.</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>17</td>
<td>$30,450.00</td>
<td>17</td>
<td>$30,450.00</td>
<td>2</td>
<td>$1,980.00</td>
<td>36</td>
<td>$62,880.00</td>
</tr>
<tr>
<td>2003</td>
<td>14</td>
<td>$28,500.00</td>
<td>13</td>
<td>$25,500.00</td>
<td>2</td>
<td>$2,000.00</td>
<td>29</td>
<td>$56,000.00</td>
</tr>
<tr>
<td>2004</td>
<td>9</td>
<td>$24,150.00</td>
<td>11</td>
<td>$27,150.00</td>
<td>2</td>
<td>$2,000.00</td>
<td>22</td>
<td>$53,300.00</td>
</tr>
<tr>
<td>2005</td>
<td>11</td>
<td>$33,000.00</td>
<td>9</td>
<td>$33,750.00</td>
<td>2</td>
<td>$2,000.00</td>
<td>22</td>
<td>$62,000.00</td>
</tr>
<tr>
<td>2006²</td>
<td>9</td>
<td>$33,750.00</td>
<td>9</td>
<td>$33,750.00</td>
<td>2</td>
<td>$2,000.00</td>
<td>20</td>
<td>$69,500.00</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>$149,850.00</td>
<td>59</td>
<td>$143,850.00</td>
<td>10</td>
<td>$9,980.00</td>
<td>129</td>
<td>$303,680.00</td>
</tr>
</tbody>
</table>

¹ Source of data is Department of Computer Science budget for graduate assistants.
² Stipend for graduate assistants changed from $6000.00 per academic year to $7500.00.

2) Graduate Merit Scholarships. Competitive, graduate merit scholarships in the amount of $1000.00 per academic year are awarded by the University. Table 4.4 shows the total amounts for scholarships awarded in the review period. Table 4.5 shows the number of recipients for the same time frame. During the review period, no applicant from the M.S. program in computer science was denied a scholarship.

International and out-of-state U.S. residents were awarded tuition waivers as a result of receiving the graduate merit scholarship. Recipients of the tuition waivers were assessed tuition and fees at the same rate as a resident of the State of Texas. This resulted in a substantial reduction in tuition and fees for those students.
Table 4.4. Graduate Merit Scholarships.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>$5,000.00</td>
<td>$8,500.00</td>
<td>$2,000.00</td>
<td>$15,500.00</td>
</tr>
<tr>
<td>2003</td>
<td>$8,000.00</td>
<td>$7,500.00</td>
<td>$500.00</td>
<td>$16,000.00</td>
</tr>
<tr>
<td>2004</td>
<td>$5,000.00</td>
<td>$6,500.00</td>
<td>$1,500.00</td>
<td>$13,000.00</td>
</tr>
<tr>
<td>2005</td>
<td>$6,000.00</td>
<td>$7,000.00</td>
<td>$1,000.00</td>
<td>$14,000.00</td>
</tr>
<tr>
<td>2006</td>
<td>$5,000.00</td>
<td>$5,500.00</td>
<td>$500.00</td>
<td>$11,000.00</td>
</tr>
</tbody>
</table>

*Source of data is Scholarship Notification Award forms.

Table 4.5. Count of Graduate Merit Scholarship Recipients.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>10</td>
<td>17</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2003</td>
<td>16</td>
<td>15</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>11</td>
<td>14</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2005</td>
<td>12</td>
<td>14</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2006</td>
<td>10</td>
<td>11</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source of data is Scholarship Notification Award forms.

f. Selection Process for Financial Awards

All applicants who are admitted to the M.S. program in computer science are eligible to apply for both a graduate assistantship and a graduate merit scholarship. Awards of graduate assistantships are made first to returning students (those who have enrolled during the previous academic year) and remaining funds are allocated to newly admitted students on a first-come, first-awarded basis with preference given to Midwestern State University graduates. Applicants who do not receive a graduate assistantship in a particular year are given preference over new applicants in the subsequent school year.

All assistantships are awarded with a caveat that funds must be available from the university to fund the awards. Scholarships are awarded to applicants who receive a graduate assistantship.
5. Student Achievement

a. Awards

Computer Science graduate students have been very successful in their academic endeavors. A number of students have been recipients of prestigious awards in the last five years. (See Appendix 3 for a comprehensive list).

In the past 5 years a computer science graduate student has been selected MSU Outstanding Graduate Man on two separate occasions. Four computer science graduate students were selected for induction into Who’s Who Among Students in American Colleges and Universities. Sixteen computer science graduate students were inducted in the Upsilon Pi Epsilon honor society in the Computing Sciences. Thirty-two computer science graduate students received graduate merit scholarships.

b. Professional publications

Computer science graduate students have been highly productive in terms of research and publications. In the last five years, 19 students co-authored a published peer-reviewed article, resulting in a total of 27 publications.

c. Professional presentations

Twenty six computer science graduate students were responsible for 30 presentations at regional, national and international conferences on the computer field in the period of 2002 to 2007.

d. Exhibitions

Not applicable to computer science.
6. Graduate Faculty

a. Demographics

The Department of Computer Science has six graduate faculty, two women and four men. Among those six, one is Hispanic and the remaining are Caucasian.

b. Student/Faculty Ratio

The computer science graduate program has an excellent student/faculty ratio averaged at 4.3:1 in the period 2002-2006.

c. Average Course Load

The standard course load for a graduate faculty member is nine hours.

d. Additional Instruction Responsibilities Including Special Topics, Seminars, Thesis, Advising, Independent Study, Student Research, etc.

Graduate faculty members have a broad list of duties in addition to teaching. Activities directly related to the graduate program include:

- Supervising student research and writing of a required file paper
- Conducting comprehensive oral examinations of graduating students
- Conducting research, publishing and presenting results in conferences
- Reviewing papers for conferences and journals
- Recruiting new students and advising current students with respect to career options
- Sporadically teaching special problems classes (independent study)
- Representing the program at career fairs and other events

e. Qualifications

Three of the graduate faculty members have a Ph.D. in Computer Science, one has a Ph.D. in Computer Science and Engineering, one has a Ph.D. in Mathematics and a masters degree in Computer Science and one is A.B.D. in Computer Science. A summary of the qualifications of the graduate faculty is provided in Appendix 4.

f. Productivity

1) Teaching. Each graduate faculty member has taught an average of six different courses in the period 2002-2007. At any long semester, four of the graduate faculty will be teaching graduate classes. Usually, one or two graduate faculty will teach one class during the summer.

2) Advising. All graduate students are academically advised by the computer science coordinator of graduate studies. All graduate faculty members are also responsible for file paper advising and career counseling.

3) Research, Scholarships and Grants. In the period of 2002-2007, the computer science graduate faculty members have worked on several research projects, some of them funded with grants from the Texas high Education Coordinating Board, MSU University Research Funds, and College of
Science and Mathematics research funds. The result of this research effort has been published in 40 conference and journal papers.

4) Professional Service and Consultation. The computer science and graduate faculty are members of numerous university, college and departmental committees. They work also as reviewers for conferences and journals and volunteer their time with local organizations. Some have done professional consultation work.

5) Honors and Awards. Two of the graduate faculty members are recipients of the Hardin Professor Award (Yearly Hardin Foundation award to a single MSU professor that has shown outstanding research, teaching and service). During the period 2002-2007, some of the graduate faculty members were recipients of significant academic awards such as Faculty of the Year, conferred by the Students Government Association, Faculty Award, conferred by the MSU Faculty, Faculty of the Year Award, conferred by the Caribbean Students Organization, Outstanding Service to MSU, conferred by TACT. They are also members of a selected group named on Who’s Who in America, Who’s Who in Science and Engineering, and International Who’s Who of Professionals. Some of the faculty member had papers selected for best paper awards in international conferences held in the assessment period.

g. Role of Adjunct Faculty

The computer science graduate program does not employ adjunct faculty in its classes.

h. Retention/Turnover of Full-Time Faculty for the Past Five Years

The computer science graduate faculty has an excellent retention record with no change in the last five years.
7. Graduate Curriculum

a. Course Enrollments and Frequency of Offerings

1) Course Enrollments. Table 7.1 summarizes the course enrollments and frequency of offerings.

Table 7.1. Course Enrollments and Frequency of Offerings.¹

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5113, Adv. Programming Languages</td>
<td>F 12</td>
<td>Sp 12</td>
<td>S1 4</td>
<td>S2 10</td>
<td>F 7</td>
</tr>
<tr>
<td>5143, Adv. Operating Systems</td>
<td>9</td>
<td></td>
<td>8</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>5153, Adv. Software Engineering</td>
<td>11</td>
<td></td>
<td>8</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>5203, Embedded Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5213, Wireless Computer Comm.</td>
<td>11</td>
<td></td>
<td>15</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>5223, Language Trans. and Interp.</td>
<td></td>
<td>11</td>
<td></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>5243, Algorithm Analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5253, Expert Systems</td>
<td>9</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5303, Adv. Database Mgt. Systems</td>
<td>13</td>
<td></td>
<td>11</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>5313, Automata Theory</td>
<td>6</td>
<td></td>
<td>7</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>5323, Computer Meth. in App. Sci.</td>
<td></td>
<td></td>
<td>7</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>5333, Discrete System Simulation</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5353, Topics in Computer Graphics</td>
<td>7</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5433, Topics in Parallel &amp; Dist. Sys.</td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>5443, Adv. Topics in Computer Sci.</td>
<td>canc</td>
<td>5</td>
<td>11</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5463, Applied Soft Computing²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5991, Independent Study³</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5993, Problems</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>6901, Seminar⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6903, Research Methods⁵</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Source of data is the Midwestern State University Student Information System (SIS)
² New course added in Spring, 2005
³ Course dropped from inventory in Fall, 2004
⁴ New course added in Fall, 2004
⁵ New course added in Fall, 2004

2) Frequency of Offerings. Four master’s-level courses are offered each semester along with the independent study courses. Courses comprising the core of the M.S. program are offered so that a student can complete the five-course block in no more than three semesters. Two core courses are offered each semester (excluding summer sessions) with the five being scheduled such that each will be offered in a span of no more than three semesters. Adjustments to the scheduling are made in response to enrollment demand for the courses.

b. Curriculum Development and Revision

The graduate faculty operates in concert in proposing and approving additions and revisions to the M.S.
program. The last major revision to the curriculum was approved for the 2004-2006 edition of the graduate catalog. These changes were implemented as a result of the Master of Science Degree Improvement Plan proposed by the graduate computer science faculty in the spring of 2003 (see Appendix 9). Other changes of a less sweeping nature have been implemented in the 2006-2008 edition.

1) 2004-2006 Changes.
   a) Change: The option to allow a graduate student to pursue a minor in computer science at the graduate level was deleted. Justification: For more than 10 years no student exercised the minor option.
   b) Change: Undergraduate courses that could be taken for graduate credit were removed from the catalog. A graduate student is allowed to take an undergraduate course for graduate credit only when there is no graduate course for which the student can enroll. Justification: Allowing undergraduate courses to be taken for graduate credit diverted enrollments from graduate-level courses, resulting in fewer students in graduate courses. It was also noted that, even with additional work being required to receive graduate credit, the level of academic rigor did not achieve graduate standards.
   c) Change: CMPS 5153 Advanced Software Engineering was changed to emphasize more of the management aspects of software development. For example, the topics of project planning, project tracking and quality assurance control were added. Advanced topics in formal methods and techniques are explored, as well. Justification: Information from recent publications and conferences suggest that these topics are necessary for students who are pursuing jobs in the software engineering arena.
   d) Change: CMPS 5463 Applied Soft Computing was added to the curriculum after having been taught as a topics course in two summer sessions. Justification: The faculty member’s review of current literature indicated that this is a new area of research that is becoming quite popular for very large problems.
   e) Change: CMPS 5353 Topics in Computer Graphics was updated to reflect the changing architectures found in present day graphics hardware and software, including GLSL, OpenGL and Render Monkey. Justification: Leading edge graphics processors, such as those developed by Nvidia since 2000 have the ability to directly execute vertex and fragment shader algorithms. A new shader language, GLSL, has been introduced to the class to make use of the modern hardware. New hardware was recently purchased that supports the latest version of OpenGL and associated GLSL programs. These machines together with GLSL and new extension library support are used to write shader programs and study the power of the new systems. Software that supports the design of shaders, e.g. RenderMonkey from AMD, has been also incorporated into the class to speed up and clarify shader code development.
   f) Change: CMPS 5133 Advanced Computer Architecture was revised to focus more on microprocessor features designed for performance improvement. Justification: Previous material was more generic in nature and still partially based on old mainframe systems which are no longer applicable. Changes triggered by industry trends reported in multiple media sources.
   g) Change: In CMPS 5213 Wireless Computer and Data Communication the major changes were based on the industry movement towards wireless communication, including the physical aspects of the wireless systems as also the Web browsing capabilities available on cell phones. Justification: The changes were based on industry trends assessment.
   h) Change: CMPS 5203 Embedded Systems was given a new title. The new title replaced the “Microcomputers” title that focused on processor design and assembly language. The new course focuses on the design of embedded systems, which are becoming a required commodity in several industry fields, such as telecommunications, auto manufacturing, etc. Justification: This change was triggered by feedback from students who were interviewed for positions requiring embedded systems knowledge.
   i) Change: CMPS 5303 Advanced Data Base Management Systems was changed to focus on the development of the data base management system itself, discussing file access implementation and optimization techniques among other details to ensure a variation from the undergraduate course which
is focused on the design and implementation of data base applications. Justification: The change was initiated by a modification to the undergraduate material and to ensure that the course was distinct from the undergraduate course of similar name.

j) Change: CMPS 5333 Discrete System Simulation changed the programming component from the simulation language GPSS to the simulation environment by EDS. Justification: A review of recent publications in the Winter Simulation Conference for the past several years shows that current simulation research is performed using fifth generation environments, not earlier simulation languages.

k) Change: CMPS 5443 Advanced Topics: Network Security was offered in a summer session. Justification: The topic was chosen based on student interest demonstrated through informal contacts with the faculty and on increased demand in the industry.

l) Change: CMPS 5443 Advanced Topics: Computer Forensics was offered in a summer session. Justification: The topic was chosen based on student interest demonstrated through informal contacts with the faculty and on increased demand in the industry.

2) 2006-2008 Changes.

The graduate admissions and requirements for acceptance into the M.S. program were changed to correspond to those of the university. Additional requirements were added to the general requirements that apply specifically to applicants to the computer science graduate program.

c. Modes of Instruction.

All courses in the computer science master’s program are taught as lecture courses with hands-on exercises assigned as out-of-class exercises.

d. Number and Proportion of Dual Listed Courses and Undergraduate Courses Taken for Graduate Credit.

The Department of Computer Science offers dual listed courses only in the summer terms, which provides for two such courses per year. Graduate students in these courses are required to complete additional work beyond that of the undergraduate students enrolled. Examples of the additional work include presentations of material to the class, research papers, and additional projects. Undergraduate courses at the junior and senior level may be taken for graduate credit only in circumstances where the graduate students have no graduate courses available to them (they have received credit for all graduate courses scheduled for the semester).
8. Program Support

a) Library and Technology Support

The MSU library currently has 2253 items catalogued in the computer science classification call number range. Of those, 372 were added between January 2002 and December 2007. There are currently 18 journal subscriptions. There are 518 computer science related titles in the electronic book database. There are five specialized databases that contain computer science articles.

The computer science budget is currently $3800 annually. Orders for print and video materials are made through the department’s designated library liaison. Historically, the department utilizes all its funds yearly. In addition, the library makes unused funds from other budget units available in the summer. Computer science often takes advantage of this resource.

The library has a specified librarian assigned to the Department of Computer Science to assist in whatever services are needed for faculty and student support.

The Information Systems Department of the university provides support in terms of hardware purchases and installations, laboratory maintenance, software installation, network installation and maintenance, and software support for students through the Microsoft Campus License Agreement. The Department of Computer Science maintains an excellent working relationship with the Information Systems staff.

b) Classrooms, Laboratories, and Offices

The Department of Computer Science has priority scheduling for once lecture classroom and one laboratory classroom. Classroom space in Bolin Hall, which houses the College of Science and Mathematics, including the Department of Computer Science, is in high demand and is generally inadequate for the number of courses being offered. In spite of the spirit of cooperation that exists within the college, several computer science courses are held outside Bolin Science Hall each term. Because the graduate courses are held in the late afternoon and evening, these are always held in Bolin. As programs in the college continue to grow, the lack of classroom and laboratory space is expected to become even more pronounced.

The computer science office suite consists of seven faculty offices, a reception area and a small graduate student office. Thus, one faculty member must office elsewhere. Offices are very small and do not provide the space necessary for comfortable faculty-student-equipment interaction in the office setting.

c) Budget

Table 8.1 provides the departmental budget for the past six years. It has been fixed for the past four years.

d) Support Staff

The Department of Computer Science has one full-time secretary. A full-time secretarial position is adequate support at this time. Most semesters a graduate assistant is assigned to the computer science office to assist the secretary and the faculty with daily needs such as making copies and running errands on campus. The department utilizes graduate assistants to serve as lab assistants, tutors and graders.
Table 8.1. Department Budget.

<table>
<thead>
<tr>
<th>Year</th>
<th>M&amp;O</th>
<th>Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-2003</td>
<td>$16,000</td>
<td>$4,200</td>
</tr>
<tr>
<td>2003-2004</td>
<td>$14,400</td>
<td>$3,780</td>
</tr>
<tr>
<td>2004-2005</td>
<td>$14,400</td>
<td>$3,780</td>
</tr>
<tr>
<td>2005-2006</td>
<td>$14,400</td>
<td>$3,780</td>
</tr>
<tr>
<td>2006-2007</td>
<td>$14,400</td>
<td>$3,780</td>
</tr>
</tbody>
</table>
9. External relationships

a. Interdisciplinary Projects

During the past five years cooperative efforts with other MSU departments have been conducted. The projects are:

- “Locating Convex Corner Points on Discrete Closed Curves,” Mathematics, 2007;
- “DNA sequencing algorithms,” Biology, project UGROW, 2007;
- “Computerized Analysis of Flowing Conditions for Use of Chemical Sticks in Natural Gas Wells,” Physics, 2006;
- “Computational Model of Temperatures in a Covered Water Body Responding to Solar Insolation,” Physics, 2005; and
- “A Computerized Ecological Assessment of Families of Beetles from the Chihuahuan Desert of West Texas,” Biology, 2005.

b. Internships and Practica

There are no internships for graduate students.
10. Overall Program Assessment

   a. Description of the Process by Which the Program Assesses Itself

Program assessment is accomplished using a variety of quantitative and subjective measures. Assessment is a continuous process which looks at programmatic parameters as well as the performance of students in the program.

Quantitative measurements include number of students graduating, placement of graduates, and student evaluations of courses. Areas in which subjective examinations are performed include quality of graduates as reflected by grades and the file paper, quality of file papers, performance on oral examinations, student evaluations of classes, and comments gleaned from the graduate student exit survey. The graduate faculty also performs periodic (bi-annual) evaluations of the program by comparing it to other graduate programs of similar size, curriculum, admission requirements, degree requirements, and graduation requirements.

Students complete a course evaluation at the end of each course. The evaluation includes both subjective and objective questions. Copies of the course evaluation forms are provided in Appendix 5 (previous) and Appendix 6 (current). In addition, all graduate students complete an exit survey developed by the department. Questions regarding the student’s satisfaction with the program as well as information about plans after graduation are included. A copy of the Exit Survey is provided in Appendix 7. In 2005-2006, the department distributed a survey to all alumni of the master’s degree. A copy of that survey can be found in Appendix 8.

In the fall of 2006, the department contacted all former students for whom and email address was available requesting they complete a survey related to their current employment and their educational experience at MSU. The Alumnae Questionnaire was emailed to the students and posted on the department web site. (See Appendix 8 for a copy of the survey.) Thirty-nine surveys were returned. Of those, some questions were not answered, but the results provided many good and honest responses. Table 10.1 provides a summary of some of the results.

<table>
<thead>
<tr>
<th>Question</th>
<th>Results (39 returned surveys)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working in discipline</td>
<td>6 No, 33 Yes</td>
</tr>
<tr>
<td>Salary Range</td>
<td>8 &lt; 50K, 1 50-75K, 6 76-100K, 4 &gt; 100K</td>
</tr>
<tr>
<td>Quality of CS Education</td>
<td>21 Excellent, 7 Above Average, 4 Average, 0 Below Average, 0 Poor</td>
</tr>
<tr>
<td>Best Course</td>
<td>Top 4: Software Engineering, Operating Systems, Architecture, Graphics</td>
</tr>
<tr>
<td></td>
<td>All 5 core courses and 9 other courses received votes</td>
</tr>
<tr>
<td>Other Comments</td>
<td>Many mentioned the general problem solving and software development skills and the accessibility of the faculty as positive aspects of the program</td>
</tr>
<tr>
<td>Employers (abbreviated list)</td>
<td>Microsoft, Lockheed-Martin, IBM, Merrill-Lynch, Northrop-Grumman, Nortel, Alcatel, Monster, Go-Daddy, Verizon, Capital One, McKesson, SAS</td>
</tr>
</tbody>
</table>

Table 10.1. Results of Alumnae Questionnaire – Fall 2006

   b. Qualitative and Quantitative Information Collected

A substantial amount of data has been collected in support of the activities of program assessment. Included among the information collected are the number and quality of graduate file papers, the results
of oral examinations, data gathered from the graduate exit survey, and comments from correspondence with alumni of the program which address placement information, salaries, curriculum suggestions, and comments regarding the general quality of education received while in the program.

Additional information includes quantitative measures such as the number of publications produced by students, average time to complete the M.S. degree, and the ratio of graduates to matriculants (Reference Section 3 of this study).

c. Strengths

The M.S. degree in Computer Science is strong in many respects. Foremost among these are the dedication of the faculty to excellence in teaching and their focus on student success, reflected in part by the practice of an “open door” policy which makes faculty readily available to student inquiry. Faculty members are open to new ideas and take the initiative to introduce new knowledge into the program curriculum.

The diversity of interests of the computer science faculty is also a strength, with the faculty encouraging student participation as members of a research team. The faculty members have received several local and state grants in the recent past allowing for partial support for students participating in research. Because this is a small department, all students who are interested are afforded the opportunity to participate in research.

Also, the faculty stresses collegiality among themselves and with other programs on the campus, as demonstrated by the co-sponsorship of interdepartmental activities such as the North Texas Area Student Conference (NTASC) which is a joint effort of the Department of Computer Science and the Management Information Systems Department in the College of Business Administration. The Math, Science, and U girls’ conference is a multi-disciplinary venue supported by all the departments in the College of Science and Mathematics. A spring barbecue with the Departments of Computer Science and Mathematics has a history of twenty-plus years. A number of interdisciplinary research efforts have also been pursued by the department.

Student contributions to the program also infuse a measure of strength into the program. Activities of the student ACM organization provide a venue for developing establishing relationships apart from classroom and study environments.

The success of students in the university community also strengthens the program. Each year several students are nominated and selected for recognition by Who’s Who Among Colleges and Universities and Upsilon Pi Epsilon honor society in computing sciences. On several occasions computer science graduate students have been honored by nomination as outstanding graduate student of the year.

The graduates of the program have been highly successful in obtaining employment, recording 100% placement. Many of the graduates work for well known companies, including Microsoft, IBM, KPMG, Stanley, Nortel, Raytheon, Sun Computing, Oracle, Verizon Communications, Go Daddy, Lockheed-Martin and General Dynamics.

Of no less importance to the strength of the program are the small class sizes and low student-to-faculty ratio.
d. Weaknesses

There exist several areas of the program that can be characterized as less than acceptable and are, therefore, considered to be weaknesses.

There are no scholarships for graduate students that are managed by the department; thus, there is no flexibility in the awarding of scholarships and no set budget on which the department can rely. Historically, all graduate students who apply have been awarded graduate merit scholarships by the university, but the amount is fixed and awarded by the Graduate Dean.

The funding for graduate assistantships at $7500.00 per 9-month school year per student is less than adequate and significantly less than universities with which we compete for students. Increased stipends would attract more and higher quality applicants.

A lack of adequate opportunity for faculty development continues to be a significant hindrance to program progress and growth. The health of the M.S. curriculum can be affected by the need to introduce new, contemporary topics with the depth and rigor demanded in graduate courses. The ability to introduce new or revised subject matter in a rapidly-changing discipline such as computer science is important to the continued strength of the program. There exists no source of funding that can be applied directly to faculty development other than that available for traveling to present papers at conferences or taking a sabbatical. Although there are a limited number of university and college grants awarded each year, they are primarily for research support and do not allow for release time for faculty members.

The limited physical space available for laboratories, faculty offices and student work areas are also of concern. Faculty offices are under-sized with minimal room for the furniture, computer systems, and resource materials required by an active teacher/researcher.

Computer laboratory space is less than adequate for existing computing facilities and associated research. Currently there are three laboratories dedicated to specific activities: Bolin 103 is a computer literacy laboratory, Bolin 119 is a general programming laboratory for computer science students, and Bolin 120 houses the graphics laboratory and the Linux server which hosts the computer science web site. Bolin 133 contains elements of two different laboratories including a PC cluster for distributed computing, a small Linux–based network, and a reserve of 10 PCs. The need for space dedicated to particular classroom and research activities reduces the effectiveness in support of research and teaching.

There is no space available for graduate students to study or network among themselves.

Other areas of concern include a lack of funded research and a need for comprehensive library support to research in the form of electronic access to journals (e.g., ACM and IEEE electronic libraries).

e. Opportunities

MSU is currently conducting a financial campaign on behalf of the College of Science and Mathematics to obtain a matching-funds grant of $500,000. This endowment will provide funds to address some of the issues facing the department, primarily scholarships and faculty development.
f. Threats

The M.S. program is faced with several significant and, in some cases, imminent threats. The most pressing threat is the lack of a steady source of applicants to the program. Although the number of applicants (and subsequent admissions) increased slightly in the 2006-2007 school year, the resulting enrollments are trending downward, threatening to reduce the number of graduate courses that can be taught per semester. This can be attributed partially to the declining number of students being graduated by the department’s undergraduate computer science program, some of whom pursue the M.S. degree at Midwestern. The number of matriculating international students, historically a primary source of students entering the program, has experienced a similar reduction. Though this is a national trend, it affects smaller programs such as this one more significantly.

Also of concern is the aging faculty of the program. One-third of the graduate faculty is considering retirement within the next five years. With the graduation of Ph.D.s in computer science dwindling, replacing faculty who leave will be a concern.

Regular interaction with computing-related businesses is almost non-existent. The distances between Wichita Falls and those entities, the closest of which are in the Dallas-Ft.Worth Metroplex and in Oklahoma City, minimizes the opportunities of both faculty and students to be exposed to contemporary computing practices and environments.

Although often overlooked, a real threat is posed by the media’s inaccurate portrayal of the computing industry in general. The demand for educated professionals in computing is high and continues to grow while the perception of an industry in decline due to off-shoring and other paradigm shifts in the industry is presented by the media.

h. Needs

The needs of the M.S. program in computer science reflect a strengthening of positive characteristics of the program and the remediation of identified weaknesses. These include:

1) Faculty release time or summer funding for new course development;
2) Faculty development support encompassing funding for attending workshops, conferences, and other developmental activities;
3) An increase in graduate student stipends to $12,000 to $15,000 per student per academic year;
4) Five endowed graduate scholarships administered by the Department of Computer Science;
5) A person dedicated to recruiting M.S. degree students as part of an overall effort within the College of Science and Mathematics;
6) An endowed chair in computer science; and
7) A system administrator for computer resources.
11. Action plan

a. Action Plan and Timeline

The Department of Computer Science recognizes the importance of research to both the faculty and students in a graduate program. The department will encourage the faculty to continue to submit grant proposals to a variety of local (e.g., MSU), state (e.g., THECB), and national (e.g., NSF) grant programs with the goal of obtaining one major grant within the next 5 years.

Based on the belief that research is an important component for graduate programs, the department will encourage the formation and continuation of faculty-student research groups with a goal of engaging every graduate student in a research project with a faculty member for at least one semester during their graduate program. A related goal is that each research group will submit at least one paper for publication per year. It is also the goal that one faculty member and a student researcher will attend a professional conference in the area of research each year.

The Department will continue its recruiting efforts by promoting the graduate program on the MSU campus by having booths at both the Majors Fair and the Graduate School Fair. Promotional posters will continue to be sent to other universities. It is believed that larger stipends and scholarships are absolutely necessary to recruit quality students. The goal is to have 20 full-time graduate assistantships available to graduate students each year in amounts that will attract strong students. In addition to the university’s graduate scholarships, the department will seek to establish five scholarships administered by the department.

Due to the dynamic nature of the computing field, the department plans to request summer support for one faculty member for curriculum development. The goal is to have one such person supported approximately every 2 to 3 years.

The department will continue to pursue avenues of funding for graduate student scholarships via connections with former students and local and regional businesses. The College of Science and Mathematics is developing an endowment for the college. The department plans to allocate a portion of the proceeds (should they become available) for scholarships.

The department will continue to seek sources of funding for hardware acquisition. The objective is to upgrade a significant component of hardware each year. It is also the goal of the department to have computers and projectors in each teaching classroom and laboratory for optimal educational effectiveness.

The department plans to establish substantial ties to computing-related industries by organizing an advisory board of business and computing professionals from companies locally and regionally. The goal is to have a board of at least six persons by the fall of 2008. The board will meet with the Department of Computer Science faculty at least twice a year.

b. Budget

Clearly, funds are necessary to implement new activities within an academic department. The department believes that graduate assistantships must be $12,000 to $15,000 per year to be competitive with other universities and to attract the brightest students. Twenty assistantships are needed. In addition, up to five scholarships should be available in for the same reason, each in the amount of
$2,000 per year. To keep hardware updated in this rapidly changing discipline, approximately $5000 to $7500 per year is necessary.

As the Department achieves its goal of student research and publication, funds are needed to send students and faculty to conferences. Approximately $4000 per year is necessary to assure that the student and faculty are able to attend the full conference, regardless of its location, and to attend related workshops.

To accomplish the supported summer curriculum development, approximately $6000 will be necessary each summer in which the support is provided. A small amount, approximately $500 per year, will be necessary to provide food and other minor services for the advisory board when they are on the MSU campus.
APPENDIX 1
University Graduate Admission Requirements

Unconditional Admission
An applicant who meets each of the following admission criteria may be admitted unconditionally by the graduate faculty of the student’s intended major:

1. A bachelor’s degree from a regionally accredited institution. (The equivalent of foreign degrees is evaluated by International Students Office.) The MSU Admissions Office must receive an official transcript, including one on which a bachelor’s degree is posted, directly from each institution the applicant has attended.

2. A GPA of at least 3.0 on the last 60 hours of undergraduate work exclusive of credit hours awarded by a two year college.

3. A satisfactory score on the GRE/GMAT/MAT. (The specific admissions test accepted is determined by the student’s intended graduate major department.) The MSU Admissions Office must receive official admissions test scores directly from the organization that administers the test.

4. An undergraduate background judged by the graduate faculty of the student’s intended major to be adequate for success in the student’s intended major.

Conditional Admission
An applicant who does not meet each of the above admission criteria may be conditionally admitted by the graduate faculty of the student’s intended major if the applicant has the following:

1. A bachelor’s degree from a regionally accredited institution. (The equivalent of foreign degrees is evaluated by International Students Office.) The MSU Admissions Office must receive an official transcript, including one on which a bachelor’s degree is posted, directly from each institution the applicant has attended.

2. An official score on the GRE/GMAT/MAT. (The specific admissions test accepted is determined by the student’s intended graduate major department.) The MSU Admissions Office must receive official admissions test scores directly from the organization that administers the test.

A student who is conditionally admitted must remove the condition by earning a grade point average of 3.0 in the first four graduate courses (which total at least 12 SCH) applicable to the student’s graduate major. Students who are assessed additional undergraduate leveling work must complete that work at the direction and to the satisfaction of the coordinator of the student’s graduate major.

Conditional Admission by Review
An applicant who is not admitted under either of the above procedures may be conditionally admitted by review by the graduate faculty of the student’s intended major if the applicant has the following:

1. A bachelor’s degree from a regionally accredited institution. (The equivalent of foreign degrees is evaluated by International Students Office.) The MSU Admissions Office must receive an official transcript, including one on which a bachelor’s degree is posted, directly from each institution the applicant has attended.

2. An official score on the GRE/GMAT/MAT. (The specific admissions test accepted is determined by the student’s intended graduate major department.) The MSU Admissions Office must receive official admissions test scores directly from the organization that administers the test.

3. In cases where the applicant’s undergraduate GPA, or required admissions test score, or undergraduate background has been judged by the graduate faculty of the student’s intended major to be inadequate for unconditional or conditional admission, the applicant may request
consideration for conditional admission by review by providing documentation regarding one or more of the following factors.

a. the applicant’s academic record as a high school student and undergraduate student;

b. the socioeconomic background of the applicant while the applicant attended elementary and secondary school and was an undergraduate student, including any change in that background;

c. whether the applicant would be the first generation of the applicant’s family to attend or graduate from an undergraduate program or from a graduate or professional program;

d. whether the applicant has multilingual proficiency;

e. the applicant’s responsibilities while attending elementary and secondary school and as an undergraduate student including whether the applicant was employed, whether the applicant helped to raise children, and other similar factors;

f. to achieve geographic diversity: the applicant’s region of residence at the time of application and, if the applicant graduated from a public high school in Texas within the preceding 20 years, the region in which the applicant’s school district is located;

g. the applicant’s involvement in community activities;

h. the applicant’s demonstrated commitment to a particular field of study;

i. for admission to a professional program: the current comparative availability of members of that profession in the applicant’s region of residence in which the applicant attended elementary and secondary school; whether the applicant was automatically admitted to a general academic teaching institution as an undergraduate student under section 51.803 and the applicant’s personal interview.

A student who is conditionally admitted by review must remove the condition by earning a grade point average of 3.0 in the first four graduate courses (which total at least 12 SCH) applicable to the student’s graduate major. Students who are assessed additional undergraduate leveling work must complete that work at the direction and to the satisfaction of the coordinator of the student’s graduate
APPENDIX 2
Department of Computer Science Graduate Admissions Criteria

Graduate Admissions

An application for admission to the Midwestern State University graduate program is available on the web site at http://www.mwsu.edu.

International applicants must provide a TOEFL score of at least 230 on the computer-based examination.

1. **Unconditional Admission.** An applicant to the graduate degree program in Computer Science must satisfy the requirements of the University’s graduate admissions policy for unconditional admission found on page 20 of this catalog.

   Additionally, the applicant must possess an undergraduate background judged by the faculty of the Computer Science graduate program to be adequate for success in the discipline, to include at least 15 credit hours in Computer Science and mathematics preparation through Discrete Mathematical Structures and Calculus I.

   The applicant must submit scores on the Graduate Record Examination that place him/her at or above the 30th percentile on the verbal examination, and at or above the 50th percentile on the quantitative examination.

2. **Conditional Admission.** An applicant who is not accepted unconditionally will be evaluated for conditional admission in accordance with the University’s graduate admissions policy for conditional admission found on page 20 of this catalog.

   An applicant accepted conditionally whose background is deemed deficient in computer science and/or mathematics will be required to complete additional undergraduate courses as specified by the graduate faculty to remove the deficiency.

3. **Admission by Review.** An applicant who is denied conditional admission may be evaluated for admission by review in accordance with the University’s graduate admissions policy for admission by review found on pages 20-21 of this catalog.
APPENDIX 3

Graduate Student Achievement

Awards
2007 MSU Outstanding Graduate Man: Hoang Duc Bui
2006 MSU Outstanding Graduate Man: Hoang Duc Bui
2007 Who’s Who Among American Colleges and Universities: Sapnah Aligeti
2005 Who’s Who Among American Colleges and Universities: Russel Zuck

Zenin Kurunthottical
2003 Who’s Who Among American Colleges and Universities: Sridevi Movva
2003 Upsilon Pi Epsilon: Clayton Crenshaw, Adisheshu Gelli, Sridevi Movva, Ranko Sevo
2004 Upsilon Pi Epsilon: Bharath Anchanta, Dileep Potnuri, Cerise Wuthrich, Peng Xue
2005 Upsilon Pi Epsilon: Robert Moss, Keith Schoby, Russell Zuck
2006 Upsilon Pi Epsilon: Kalyana Ankala, Maria Foster, Jamie Thomas, Hsu Hung Tsai
2007 Upsilon Pi Epsilon: Nicholas Whittington
2007 Graduate Merit Scholarship: Sapnah Aligeti, Kalyana Ankala, Rosana Barbosa, Hoang Bui, Salomon Lompo, Alan Moser, Juan Paramo, Yuchum Peng, Arvind Saini, Sachin Yawalkar
2006 Graduate Merit Scholarship: Sapnah Aligeti, Rejitha Anand, Kalyana Ankala, Hoang Bui, Maria Foster, Ainsley Joseph, Yuchum Peng, Arvind Saini, Dennis Stetsenko, Hsu Tsai
2005 Graduate Merit Scholarship: Sapnah Aligeti, Rejitha Anand, Kalyana Ankala, Hoang Bui, Michael Clark, Maria Foster, Ainsley Joseph, Keith Scholby, Hsu Tsai, Russell Zuck
2003 Graduate Merit Scholarship: Achanta, Dennis Amory, Rejitha Anand, Kalyana Ankala, Michael Clark, Farook, Ainsley Joseph, Katia Mayfield, Potnuri, Ranko Sevo, Hsu Tsai, Jason Valdez, Maria Voicu, Peng Xue
2002 Tom White Graduate Scholarship: Belinda Alberry, Clayton Crenshaw, Gail Kalbfleisch, D. Rasberry, Cerise Wuthrich, Duane York

Publications

Number of publications: 27; Number of student-authors: 19
(Student names are provided in bold.)


### Professional Presentations

Number of presentations: 30; Number of student-presenters: 26


C. Wuthrich, "On-Line Instructional Testing in a Mobile Environment," Fourteenth Annual CCSC South Central Conference, April 2003, Jackson, MS.


H. H. Tsai, “Parallel Shortest Path using Cluster,” North Texas Area Student Conference, Wichita Falls, TX, April 2006.

K. Ankala, “Refactoring Interfaces,” North Texas Area Student Conference, Wichita Falls, TX, April 2006.


A. Saini, “methods of Reassembly of Objects,” North Texas Area Student Conference, Wichita Falls, TX, April 2006.


N. Whittington and A. Saini, “Defect Prediction using Data from two Inspectors,” North Texas Area Student Conference, Wichita Falls, TX, April 2007.


APPENDIX 4
Graduate Faculty

a. Demographics
   Number of faculty: 6
   Gender numbers: Male: 4 Female: 2
   Ethnic/Racial Status: White (non-Hispanic): 5 Hispanic: 1

b. Student/Faculty Ratio: 4.3:1

c. Average Course Load: 9 hours

d. Additional Instruction Responsibilities
Graduate faculty members have a broad list of extra class work. Activities directly related to the graduate program include:
   • Supervising student research and writing of a required file paper
   • Conducting comprehensive oral examinations of graduating students
   • Conducting research, publishing and presenting results in conferences
   • Reviewing papers for conferences and journals
   • Recruiting new students and advising current students with respect to career options
   • Sporadically teaching special problems classes (independent study)
   • Representing the program at career fairs and other events

e. Qualifications
   Ph.D. degrees: 5 Masters Degree: 1

   Dr. Ranette Halverson:
   Ph.D. Computer Science, University of North Texas, 1993
   M.S. Mathematics, Midwestern State University, 1978

   Dr. Stewart Carpenter
   Ph.D. Computer Science, Texas A&M University at College Station, 1972
   M.C.S. Computer Science, Texas A&M University at College Station, 1968

   Dr. Timothy Donovan
   Ph.D. Mathematics, University of Colorado, 1976
   M.S. Computer Science, Shippensburg University, 1983
   M.A. Mathematics, University of Oklahoma, 1967

   Dr. Nelson Passos
   Ph.D. Computer Science & Engineering, University of Notre Dame, 1996
   M.S. Computer Science, University of North Dakota, 1992

   Dr. Catherine Stringfellow
   Ph.D. Computer Science, Colorado State University, 2000
   M.S. Computer Science, The Ohio State University, 1986

   Mr. Richard Simpson
   M.A. Mathematics, Sam Houston State University, 1973
   A.B.D. Computer Science, University of North Texas
f. Productivity

1) Teaching

Graduate Courses Taught by Faculty

Dr. Stewart Carpenter
CMPS 5113 Programming Language Concepts
CMPS 5133 Advanced Computer Architecture
CMPS 5143 Advanced Operating Systems
CMPS 5153 Software Engineering
CMPS 5253 Expert Systems
CMPS 5443 Advanced Topics (Graph Theory)
CMPS 5991 Independent Study
CMPS 5993 Problems
CMPS 6901 Seminar

Dr. Timothy Donovan
CMPS 5113 Programming Language Concepts
CMPS 5143 Advanced Operating Systems
CMPS 5243 Algorithm Analysis
CMPS 5303 Advanced Database Management Systems
CMPS 5323 Computer Methods in Applied Science

Dr. Ranette Halverson
CMPS 5313 Automata Theory
CMPS 5333 Discrete System Simulation
CMPS 5433 Topics in Parallel and Distributed Systems
CMPS 5443 Advanced Topics in Computer Science: History of Computing
CMPS 5443 Advanced Topics in Computer Science: Smart Environments

Dr. Nelson Passos
CMPS 5133 Advanced Computer Architecture
CMPS 5203 Embedded Systems
CMPS 5213 Wireless Computer and Data Communications
CMPS 5303 Advanced Data Base Management Systems
CMPS 5443 Topics in Computer Science: Computer Forensics
CMPS 5443 Topics in Computer Science: Network Security

Mr. Richard Simpson
CMPS 5143 Advanced Operating Systems
CMPS 5213 Wireless Computer Communications & Networks
CMPS 5223 Language Translators & Interpreters
CMPS 5243 Algorithm Analysis
CMPS 5353 Topics in Computer Graphics
CMPS 5433 Topics in Parallel & Distributed Systems
CMPS 5443 Advanced Topics in Computer Science (Genetic Algorithms)
CMPS 5463 Algorithm Analysis

Dr. Catherine Stringfellow
CMPS 5153 Advanced Software Engineering
CMPS5313 Automata Theory
CMPS5223 Language Translators and Interpreters
CMPS5443 Advanced Topics in Computer Science: Software Quality Assurance
CMPS5443 Advanced Topics in Computer Science: Human Computer Interaction

2) Advising

All graduate students are academically advised by the computer science coordinator of the graduate program. All graduate faculty members are also responsible for file paper advising and career counseling.

File Paper Direction

<table>
<thead>
<tr>
<th>Dr. Stewart Carpenter</th>
<th>Date</th>
<th>Title of Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pothukoochi, Venkata</td>
<td>08/03</td>
<td>Applying Ant Colony Optimization to the Resource Constrained Shortest Path Problem</td>
</tr>
<tr>
<td>Kankanala, Arjun</td>
<td>12/04</td>
<td>A Proposed Digital Watermarking Technique Using Block-Energies in the DCT Domain</td>
</tr>
<tr>
<td>Schoby, Keith</td>
<td>05/06</td>
<td>Code Performance Measurement as an Educational Tool</td>
</tr>
<tr>
<td>Achanta, Bharath</td>
<td>08/06</td>
<td>Resistance to Denial-of-Service Attacks: A Study of Windows vs. Linux</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dr. Timothy Donovan</th>
<th>Date</th>
<th>Title of Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dodla, Harsha</td>
<td>05/05</td>
<td>Addressing Crosscutting Concerns Using Aspect Oriented Programming</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dr. Nelson Passos</th>
<th>Date</th>
<th>Title of Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitchuka, Balavenkata</td>
<td>12/02</td>
<td>Comparing the Performances of the IEEE 802.11e and IEEE 802.11 Standards</td>
</tr>
<tr>
<td>Alberry, Belinda</td>
<td>05/03</td>
<td>A Study on the Performance of Wireless Communications</td>
</tr>
<tr>
<td>Cortes, Oswaldo</td>
<td>08/03</td>
<td>Evaluation of Development Strategies for Handheld Devices and Web Based Applications</td>
</tr>
<tr>
<td>Movva, Sridevi</td>
<td>08/03</td>
<td>Adjusting Web Cache Replacement Algorithms According to Use Connectivity</td>
</tr>
<tr>
<td>Crenshaw, Clayton</td>
<td>12/03</td>
<td>A Study of Message Hiding in Images</td>
</tr>
<tr>
<td>Gelli, Adiseshu</td>
<td>12/03</td>
<td>A Brief Study of Cooperative Web Caching Protocols in Cellular Networks</td>
</tr>
<tr>
<td>Nalluru, Joseph</td>
<td>12/03</td>
<td>Adaptive Virtual Web Caches</td>
</tr>
<tr>
<td>Sevo, Ranko</td>
<td>05/04</td>
<td>Study of Rijndael and Blowfish Encryption Algorithms</td>
</tr>
<tr>
<td>Xue, Peng</td>
<td>12/04</td>
<td>Modeling and Retiming Hon-Uniform Acrylic Loops</td>
</tr>
<tr>
<td>Name</td>
<td>Date</td>
<td>Title of Paper</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wuthrich, Ramona</td>
<td>08/2005</td>
<td>Instructional Testing Through Wireless Handheld Devices</td>
</tr>
<tr>
<td>Zuck, Russell</td>
<td>08/2005</td>
<td>Network Centric Improvements to Resource Caching</td>
</tr>
<tr>
<td>Schoby, Keith</td>
<td>05/2006</td>
<td>Code Performance Measurement as an Educational Tool</td>
</tr>
<tr>
<td>Mayfield, Katia</td>
<td>08/2006</td>
<td>Scheduling Multi-dimensional Loops in a Computer Cluster</td>
</tr>
<tr>
<td>Tsai, Hsu Hung</td>
<td>08/2006</td>
<td>Parallel Shortest Path Using Clusters</td>
</tr>
<tr>
<td>Moser, Alan</td>
<td>05/2007</td>
<td>An Open GL Simulation of Faceting a Gemstone</td>
</tr>
<tr>
<td>York, Duane</td>
<td>08/2003</td>
<td>Practice Component Testing with Emphasis on Object Oriented Languages</td>
</tr>
<tr>
<td>Ahmed, Haseeb Syed</td>
<td>05/2004</td>
<td>Analysis of Automated Testing Tools on an Application</td>
</tr>
<tr>
<td>Kurri, Malathy</td>
<td>05/2004</td>
<td>Test Case Generation in Automated Testing Tools: A New Approach</td>
</tr>
<tr>
<td>Amory, Cuthbert Dennis</td>
<td>08/2004</td>
<td>A Corrective Change Architecture</td>
</tr>
<tr>
<td>Kurunthottical, Zenin</td>
<td>05/2005</td>
<td>Test Case Deduction without Compromising Testing Effectiveness</td>
</tr>
<tr>
<td>Thomas, Jamie</td>
<td>08/2006</td>
<td>Using HCI Principles to Foster Technological Advancement in Sub-Saharan Africa</td>
</tr>
<tr>
<td>Anand, Rejitha</td>
<td>12/2006</td>
<td>Association Rule Mining for a Medical Record System Using WEKA</td>
</tr>
<tr>
<td>Bui, Hoang Duc</td>
<td>05/2007</td>
<td>Automatic Reconstruction of 2D Jigsaw Puzzles</td>
</tr>
</tbody>
</table>

3) Research, scholarship and grants

Dr. Stewart Carpenter
Awarded College of Science and Mathematics Research/Development grant for project entitled “Instructional Infrastructure Development for Operating Systems”; awarded $800.00 for student assistance.

Dr. Timothy Donovan (2 papers)

Dr. Ranette Halverson: (7 papers)


Workshops Presented:
“Simulation with Enterprise Dynamics Software”, 17th Annual CCSC South Central Conference, Huntsville, TX, April 2006.

Alice Programming Environment Workshop, 18th Annual CCSC South Central Conference, Wichita Falls, TX, April 2007.

Grants:
MSU research grant with Terry Griffin, $4994, funds to purchase GPS devices for data collection to continue GPS research

Dr. Nelson Passos (17 papers)


**Grants:**

**Project:** Flexible Integrated Caching Approach (FICA) for Efficient Content Delivery in Wireless Internet  
Sponsor: THECB (Texas Higher Education Coordination Board) Award #003656-0108-2001,  
Value: $66,000  
-- THECB Supplemental Grants for High School Science and Math Teachers  
Value: $8,100.00  
Duration: Summer 2002  
-- THECB Supplemental Grants for High School Science and Math Teachers  
Value: $8,100.00  
Duration: Summer 2003

**Project:** An Intelligent Entertainment Center  
Sponsor: College of Science and Mathematics Faculty Research Fund  
Value: US$ 600.00 - Duration: September 2004 to August 2005.

**Project:** Optimization algorithms for micro-parallel cluster systems  
Sponsor: MSU Faculty Grants Fund  
Value: US$ 1,854.00 - Duration: 8 months. (January 2007 to August 2007)

**Project:** HORNER: A micro-parallel system for experimental research  
Sponsor: MSU Faculty Grants Fund  
Value: US$ 4,729.00 - Duration: 1 year. (September 2005 to August 2006)

**Project:** Applying data mining to predict ecological information on families of beetles from the Chihuahuan desert of West Texas.  
Sponsor: MSU Faculty Grants Fund  
Value: US$ 4,607.00 - Duration: 1 year. (January 2006 to August 2006)

Mr. Richard Simpson (3 papers)  


Dr. Catherine Stringfellow (11 papers)


**Presentations**
“Generative Art”, ACM meeting, Midwestern State University, Sept. 2006.

4) Professional service and consultation

Dr. Stewart Carpenter  
Vice Chair, ACM Special Interest Group on Computer Use in Education  
Chair of North-Texas Area Student Conference (N-TASC), Midwestern State University, 2004 - 2007  
Judged MSU Regional Science Fair

University Committee Assignments:  
Graduate Council  
Ad hoc Subcommittee on Graduate Admissions Requirements  
Ad hoc Academic Advising Committee  
BAAS Advisory Committee  
Who’s Who Among Students in American Universities and Colleges Committee

College Committee Assignments:  
College Council

Department Committees:  
Outstanding Undergraduate Student Selection Committee  
Outstanding Graduate Student Selection Committee  
O.A. Daniel Scholarship Selection Committee  
Computer Science Departmental Scholarship Selection Committee

Administrative Responsibilities:  
Graduate Program Coordinator

Sponsorship of Student Organizations:  
Upsilon Pi Epsilon Honor Society in the Computing Sciences  
Association for Computing Machinery Student Organization (co-sponsor)

Dr. Timothy Donovan  
Testified before the Wichita Falls City Council concerning city owned airport management.  
Member of the faculty senate  
Member of the academic appeals committee

Dr. Ranette Halverson:  
Judge MSU Regional Science Fair.  
Reviewed Literature for Top of Texas – 12 books  
Computer Science 25th Anniversary Celebration – Host  
Math, Science & U Conference for Junior High Girls – Steering Committee & Host  
Consulted – Web Site Reviewer for First Baptist Church, Wichita Falls

Referee work:  
SIGCSE (ACM Special Interest Group in Computer Science Education) Annual Conference  
CCSC (Consortium for Computing in Colleges) Annual Conference  
ITICSENG (11th Annual Conference on Innovation and Technology in Computer Science and Engineering Education)  
Cybernetics and Information Technologies, Systems and Applications
Promotion Review: Dr. Tim O’Neill, University of Akron, Promotion to Associate Professor of Computer Science

University Committees:
  - Honors Program Committee
  - Pre-Law Committee
College Committees:
  - College Council
  - College Research Committee
MS & U (Math, Science, & You) Conference Steering Committee
College Notes – Editor
College Rank & Tenure Committee

Department Committees:
  - North Texas Area Student Conference Steering Committee
  - Annual Computer Science and Mathematics Awards BBQ (Chair)
  - Faculty Advisor for the following student organizations:
    - Computer Science Programming Team
    - MSU Student Chapter of the ACM – student computer club
    - UPE (Upsilon Pi Epsilon) Computer Science Honor Society
    - Campus Crusade for Christ
  - Overflow – College Bible study and worship service

Administrative Responsibilities:
  - Chair of Computer Science Department

Other activities:
  - City of Wichita Falls Charter Revision Committee – Mayor Appointment – 2005
  - Consulting for Medical GPS – Franklin, TN (non-compensated)
  - American Cancer Society Relay for Life
  - Communications Coordinator for Jay Lowder Harvest Ministries
  - Web Site Advisory Committee – First Baptist Church, Wichita Falls
  - Fall 2005 Women’s Conference Committee – First Baptist Church, WF
  - Mission Possible
    - May 2006 – Refurbishment of the sanctuary Cornerstone Church of Holliday, TX
    - July 2006 – New Orleans Mission Trip
    - Response Team Committee (Chair) – First Baptist Church, WF
    - Vision of Hope Festival for Flood Victims – August 18
    - Co-organizer of the festival held in Spudder Park for victims of the July floods
    - High School Volunteer Youth Leader at First Baptist Church
    - Decision Counselor at the Greg Laurie Evangelism Conference August 2007

Dr. Nelson Passos
Referee work:
  - 3rd International Conference on Computing, Communications and Control Technologies (CCCT 2005)
  - 17th South Central Conference of the Consortium for Computing in Small Colleges
43rd Design Automation Conference
Parallel Computing and Information Processing Letters
IEEE Transactions on Education
Member of the IEEE Transactions on Education Best Paper Award Review Committee
(participated in the selection of the 2006 Transactions’ Best Paper)
18th South Central Conference of the Consortium for Computing in Small Colleges
44th Design Automation Conference
5th International Conference on Computing, Communications and Control Technologies:
CCCT 2007
4th International Conference on Cybernetics and Information Technologies, Systems and
Applications: CITSA 2007
IEEE Transactions on Education
Database book reviewer for Thomson Course Technology

Other activities:
NSF Grant Proposal Coordinator at MSU
Computer Support to Mr. Robert Avey on Video Capture (Wichita Falls Business)
Computer Support to Engeware on File recovery (Brazilian Business)
Computer Support to CTA on Website correctness (Brazilian Air Force Research Center)
Computer use support to Lakeridge Place (Wichita Falls Assisted Living Facility)
Associate Editor for Computer Science of the Texas Journal of Science
Member of the Program Committee - 4th International Conference on Cybernetics and
Information Technologies, Systems and Applications: CITSA 2007
Member of the Technical Program Committee - The 2006 International Conference on
Embedded And Ubiquitous Computing (EUC’2006)
Publicity Chair for 18th South Central Conference of the Consortium for Computing Sciences
in Colleges
Author/reviewer for the Major Field Test in Computer Science, prepared by ETS
(Educational Testing Services)
Member of the Program Committee - 5th International Conference on Computing,
Communications and Control Technologies: CCCT 2007
Publicity Chair for the 19th South Central Conference of the Consortium for Computing
Sciences in Colleges
Faculty mentor for Dr. Salim Azzouz - School of Engineering
Volunteer “entertainer” at Lakeridge Place (Wichita Falls Assisted Living Facility)

College Committees:
Member of the College of Science and Mathematics College Research Committee

Departmental committees:
Chair of the Computer Science Undergraduate Scholarship Committee
Member of the Computer Science Graduate Recruiting Committee
Chair of the Louis Hoffman Paper Contest committee
Member of the Department CD Committee

Mr. Richard Simpson
University committees:
Information Technology Advisory Committee
Departmental committees:
- Scholarship Selection Committee
- Data Structure Textbook Selection Committee
- Introduction to Computer Science (Honors) Textbook Selection Committee
- Huffman Scholarship Paper Competition Committee

Sponsorship of Student Organizations:
- Student Chapter of the Association of Computing Machinery (ACM)
- Coach of ACM programming teams for the past 23 years.

Other activities:
- Judged MSU Regional Science Fair
- Expanding Your Horizons in Mathematics & Science Conference
- Computer Science Department 25th Anniversary Celebration
- Designed the Swan Island and helped in its construction/installation in Sikes lake.
- Assisted Biology faculty in the installation of the Swan Feeder on Sikes Lake.
- Captain of a Relay for Life Team at the Wichita Falls Annual American Cancer Society
- Served on Steering Committee for the North Texas Area Student Conference

Dr. Catherine Stringfellow:

University committees:
- Core Curriculum Committee
- Faculty/Staff Traffic Appeals Committee
- COSM Dean’s Search Committee
- American Democracy Project Committee

Departmental committees:
- Coordinator internship program for Computer Science.
- Graduate Recruiting Committee
- Chair, Computer Science Recruiting DVD Committee

Other activities:
- Reviewer, Top of Texas. Review books for a guide to children’s and young adult literature.
- Women’s Build, Habitat Humanity.
- Volunteer, Meals on Wheels.
- Campaign Coordinator, MSU Charitable Campaign.
- Consortium for Computer Science South Central Conference (CCSC:SC)
- Chair, Math, Science & U Conference for Junior High Girls.
- Steering Committee Member, North Texas Area Student Conference.
- Publicity Chair, Consortium for Computer Science South Central Conference (CCSC:SC)
- Conference Chair, Consortium for Computer Science South Central Conference (CCSC:SC)
- Judge, Red River Regional Science and Engineering Fair.
- Grader, College Board AP Computer Science Reading.
- Campaign Coordinator, MSU Charitable Campaign.
- Volunteer and fund raiser, Relay for Life, American Cancer Society
- Webmaster, Sacred Heart Singles Ministry
- Volunteer, Blessed Sacrament Thrift Shop 25cent sale event, Lawton, OK
- Volunteer, Meals on Wheels
Referee work:
   Special Interest Group on Computer Science Education, SIGCSE.
   Consortium for Computer Science South Central Conference (CCSC:SC).
   International Journal of Technology, Knowledge and Society.
   ITiCSE.
   IEEE Software.

5) Honors and awards

Dr. Stewart Carpenter
Faculty Award, 2000 – 2001, Midwestern State University

Dr. Ranette Halverson:
Outstanding Service to MSU (TACT Award), 2002
MSU Hardin Professor, 1998
Who's Who in American Colleges and Universities
Outstanding Young Women in America
CITSA 2006 - Outstanding Paper of Session: “Computerized Trip Classification of GPS Data: Proposed Framework”

Dr. Nelson Passos
Faculty Member of the Year Award 2004, MSU Student Government
Faculty Award 2003
Midwestern State University Hardin Professor 2000
Who’s Who in America
Who’s Who in Science and Engineering
Who’s Who in Science and Engineering (Millennium Ed.)
Faculty of the Year Award 2003, Caribbean Students Organization
International Who’s Who of Professionals

Mr. Richard Simpson
Faculty Award 1996

Dr. Catherine Stringfellow
Who’s Who in America, 2007
Upsilon Pi Epsilon, National Honor Society for Computer Science, 2006
Who’s Who in America, 2006
Who's Who Among American College Students, 1983 and 1984

g. Role of Adjunct Faculty (None)

h. Retention/Turnover of Full-Time Faculty for the Past Five Years (No changes)
# APPENDIX 5

MIDWESTERN STATE UNIVERSITY  
STUDENT COURSE AND LECTURE TEACHING EVALUATION  
SPRING SEMESTER 2006

DEPT: CMPS  
INSTRUCTOR:  
COURSE NO: 1023 01  
COURSE TITLE: INTRO TO COMPUTING  
NEEDS  
UNACCEPT

<table>
<thead>
<tr>
<th>ITEM</th>
<th>EXCELLENT</th>
<th>GOOD</th>
<th>ACCEPT</th>
<th>IMPROVE</th>
<th>/POOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INSTRUCTOR ABILITY TO MAKE THE PURPOSE, OBJECTIVES AND GRADING PROCEDURES CLEAR</td>
<td>8</td>
<td>38</td>
<td>2</td>
<td>10</td>
<td>3 14</td>
</tr>
<tr>
<td>2. INSTRUCTOR PREPAREDNESS</td>
<td>13</td>
<td>62</td>
<td>5</td>
<td>24</td>
<td>3 14</td>
</tr>
<tr>
<td>3. INSTRUCTOR ABILITY TO KEEP THE CLASS FOCUSED ON THE SUBJECT</td>
<td>10</td>
<td>48</td>
<td>6</td>
<td>29</td>
<td>4 19</td>
</tr>
<tr>
<td>4. INSTRUCTOR ABILITY TO GIVE ADEQUATE, CLEAR AND SPECIFIC INSTRUCTIONS</td>
<td>9</td>
<td>43</td>
<td>3</td>
<td>14</td>
<td>8 38</td>
</tr>
<tr>
<td>5. INSTRUCTOR EFFORT TO RETURN GRADED ASSIGNMENTS-FAIR TIME</td>
<td>6</td>
<td>29</td>
<td>8</td>
<td>38</td>
<td>5 24</td>
</tr>
<tr>
<td>6. INSTRUCTOR APPARENT KNOWLEDGE ABOUT THE SUBJECT MATTER</td>
<td>15</td>
<td>71</td>
<td>5</td>
<td>24</td>
<td>1 5</td>
</tr>
<tr>
<td>7. INSTRUCTOR ABILITY TO CLEARLY EXPLAIN THE SUBJECT MATTER</td>
<td>10</td>
<td>48</td>
<td>7</td>
<td>33</td>
<td>3 14</td>
</tr>
<tr>
<td>8. INSTRUCTOR ABILITY TO CHALLENGE THE STUDENTS TO THINK</td>
<td>7</td>
<td>33</td>
<td>8</td>
<td>38</td>
<td>3 14</td>
</tr>
<tr>
<td>9. INSTRUCTOR ABILITY TO MAKE THE CLASS INTERESTING</td>
<td>3</td>
<td>14</td>
<td>12</td>
<td>57</td>
<td>3 14</td>
</tr>
<tr>
<td>10. INSTRUCTOR ABILITY TO FORMULATE TESTS/PROJECTS THAT DEAL WITH MATERIAL IN THE COURSE</td>
<td>10</td>
<td>48</td>
<td>4</td>
<td>19</td>
<td>3 14</td>
</tr>
<tr>
<td>11. INSTRUCTOR ABILITY TO FORMULATE TESTS/PROJECTS THAT DEAL WITH OTHER ASSIGNED READINGS</td>
<td>11</td>
<td>52</td>
<td>3</td>
<td>14</td>
<td>2 10</td>
</tr>
<tr>
<td>12. INSTRUCTOR ABILITY TO GRADE FAIRLY AND IMPARTIALLY</td>
<td>13</td>
<td>62</td>
<td>4</td>
<td>19</td>
<td>1 5</td>
</tr>
<tr>
<td>13. INSTRUCTOR ABILITY TO GIVE CONSTRUCTIVE FEEDBACK</td>
<td>7</td>
<td>33</td>
<td>8</td>
<td>38</td>
<td>4 19</td>
</tr>
<tr>
<td>14. INSTRUCTOR COMMUNICATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. No.</td>
<td>Question</td>
<td>Results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>INSTRUCTOR ABILITY TO TREAT STUDENTS WITH PATIENCE, COURTESY AND RESPECT.</td>
<td>10 48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>INSTRUCTOR WILLINGNESS TO GIVE STUDENTS INDIVIDUAL HELP</td>
<td>13 62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>INSTRUCTOR EFFORT TO ENCOURAGE STUDENTS TO PARTICIPATE</td>
<td>9 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>INSTRUCTOR ABILITY TO GIVE CLEAR AND COMPLETE ANSWERS</td>
<td>9 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>INSTRUCTOR ABILITY TO BUILD UPON INFORMATION PREVIOUSLY TAUGHT IN THE COURSE</td>
<td>8 38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>INSTRUCTOR ABILITY TO INSPIRE STUDENTS TO LEARN</td>
<td>6 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>EVALUATION OF THE INSTRUCTOR</td>
<td>9 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>EVALUATION OF THE COURSE</td>
<td>7 33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>CURRENT GRADE IN THIS COURSE</td>
<td>6 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>EXPECTED GRADE IN THIS COURSE</td>
<td>11 52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6
Student Evaluation of Instruction – Lecture/Seminar

The following is a list of questions from the current course evaluation form. Students respond using a 5-point scale including excellent, good, acceptable, needs improvement, and unacceptable/poor.

1. Instructor ability to make the purpose, objectives and grading procedures clear at the beginning of the course.
2. Instructor’s preparedness for the class.
3. Instructor’s ability to keep the class focused on the subject of the matter of the course.
4. Instructor’s ability to give adequate, clear and specific instruction on assignments and exams.
5. Instructor’s effort to return graded assignments in a reasonable amount of time.
6. Instructor’s apparent knowledge about the subject matter of the course.
7. Instructor’s ability to clearly explain the subject matter of the course.
8. Instructor’s ability to challenge the student to think deeply about the subject matter of the course.
9. Instructor’s ability to make the class interesting.
10. Instructor’s ability to formulate tests/projects that deal with the material that is covered in the course.
11. Instructor’s ability to formulate tests/projects that deal with the material that is covered in assigned readings.
12. Instructor’s ability to grade fairly and impartially.
13. Instructor’s ability to give students specific and constructive feedback on assignments and exams.
14. Instructor’s communication skills.
15. Instructor’s ability to treat students with patience, courtesy and respect.
16. Instructor’s willingness to give students individual help.
17. Instructor’s effort to encourage student to ask questions and participate in class discussions.
18. Instructor’s ability to give clear and complete answers to student questions.
19. Instructor’s ability to build upon information previously taught in the course.
20. Instructor’s ability to inspire students to learn at a level above the minimum course requirements.
21. What is your overall evaluation of the instructor?
22. What is your overall evaluation of the course?
23. What is your current grade in the course?
24. What grade do you expect in the course?

The following open-ended questions allow for student comments.

1. Please help us improve teaching effectiveness and course quality by contributing comments and suggestions. (For example, course/instructor strengths and/or weaknesses, etc.) You input is greatly appreciated.

2. How do you feel the amount of work required in the course compares with the amount you learned?
Appendix 7

Computer Science Exit Questionnaire

Midwestern State University

Name
Address
City, State, Zip
Home Phone (     )____________________ Office Phone (     )
E-Mail

Degree:    BS/MS Year of Graduation _______ Minor ________________ Field ________________
(Please circle one)

* Note: Spaces removed for displaying in this report.

1. Have you accepted a permanent job or been accepted into graduate school (if graduate school skip to question 7)?
2. What is your job title? Starting salary?
3. What duties will you have at your new job?
4. What is the company’s name & address?
5. When did you start looking for a job?
6. Which course/skill do you feel was the most valuable in finding a job? Why?
7. What university and program will you be attending? M.S. or Ph.D. (If going to graduate school skip this question)
8. Which course/skill do you feel was the most valuable to you personally? Why?
9. If you could change one thing in the program, what would it be? Why?
10. Did you use any of the computer labs on campus? Which ones?
11. Was the software adequate in these labs?
12. What changes would you recommend for the labs?
13. How did you feel about the computer system administration?
14. How helpful were the lab assistants?
15. Did you use the 24-hour lab facility at the Clark Student Center?
16. Please add any additional comments you would like to make:
APPENDIX 8

Midwestern State University
M.S. in Computer Science
Alumnae Questionnaire

Name _____________________________________________________________
Address __________________________________________________________
City, State, Zip ____________________________________________________
Home Phone (___) __________________ Office Phone (___) ________________
E-Mail ___________________________ Year of Graduation ________

CURRENT EMPLOYMENT
1. Are you currently employed in a position that requires knowledge and skills relating to your Computer Science
   education?  Yes _____ No _____

   If the answer to Question 1 is YES, provide answers to the following questions. Otherwise, go to
   Question 8. Questions marked with an asterisk (*) are optional.

2. How many years have you been with this company?  <1 _____ 1–3 _____ 3–5 _____ >5 _____

3. What is your job title? ________________________________________________

4. What is your current salary? *<50K _____ 50K–75K _____ 76K–100K _____ >100K _____

5. What is the nature of the job that you perform?

   Non-Internet
   _____ Programming (C++ _____ JAVA _____ C# _____ Other _____________________________)
   _____ Applications software design and development
   (What applications? _____________________________)
   _____ Software testing _____ Software Engineering _____ User Support _____
   _____ Project Management
   _____ Other (Specify _____________________________)

   Internet-based
   _____ Web site development
   _____ Applications development (JAVA _____ HTML _____ XML _____ Other ________________________)
   _____ Web site/Internet administration

   Non-technical
   _____ Teaching:  K-12_____ Junior/Community College_____ University_____
   _____ Sales
   _____ Other (Specify _______________________________________________)


7. What is your current employer’s name & address? *

_________________________________________
_________________________________________
_________________________________________

ADDITIONAL EDUCATION
8. Are you currently pursuing additional graduate education or have you completed course work beyond the M.S. degree earned from MSU?

If the answer to Question 8 is YES, please answer the following questions; otherwise, go to Question 12.

9. What degree are you pursuing?
   PhD _____ in _________________  MS/MA in _________________  MBA _____  No Degree _____

10. What university did you attend or are you now attending? (University name, city and state)

   __________________________________________________________________

11. Graduation date (if applicable). __________________________

EVALUATION OF YOUR MSU EXPERIENCE
12. What is your overall evaluation of the education you received from the MSU M.S. program in Computer Science?

   Excellent _____  Above Average _____  Average _____  Below Average _____  Poor _____

   Comments relating to your response.

13. Which course(s)/skill(s) do you feel contributed most significantly to the job you are currently performing? Why?

14. Which course(s)/skill(s) do you feel has the most valuable to you personally? Why?

15. If you could change one thing in the program, what would it be? Why?

16. Would you recommend the M.S. degree program at Midwestern to your colleagues and friends?
   _____ YES  _____ NO
APPENDIX 9

Midwestern State University

COMPUTER SCIENCE PROGRAM

PROGRAM CHAIR: Dr. Ranette Halverson

Master of Science Degree
Improvement Plan

Goals and proposed curriculum
Spring 2003

Disclaimer:

This report is a summary of observations and direction goals shared by the Computer Science faculty committee in the MS degree curriculum. This report must be understood as proposal of changes, which will be the basis for future discussions and plans for the MS program.

Planning committee:  Dr. Catherine Stringfellow
                       Dr. Nelson Passos
                       Dr. Stewart Carpenter
Computer Science Program
Master of Science Degree
Improvement Plan

Overall Goal:

To provide a source of knowledge to experienced information technology professionals, an advancement of knowledge to computer science recently graduated majors and a possibility of career change for those graduated in other fields.

Basis:

Experienced IT professionals and computer science graduates will have a previous background in the computer science field and should be offered advanced topics to improve their knowledge. Non-computer science graduates should be offered an adaptation period to get introduced to the computer science field and become ready for the advanced training.

When:

In a implementation period of two to four years

How:

By replacing the current offered classes with up-to-date and more advanced topics, while reformulating the adaptation requirements and core disciplines to reflect the new goals.

Strong points:

- experience in research
- record of refereed publications
- experience in advanced subjects such as Graphics, Architecture, Image Processing, Network Security, etc
- new students with previous degree in Computer Science

Leveling Classes:

1043. Computer Science I 3(3-0) Prerequisite: Concurrent enrollment in MATH 1233
Introduction to methods of problem solving and algorithm development. A high-level programming language is taught with an emphasis on program design, coding, debugging, testing, and documentation. Discussion of ethical, social, and legal issues related to computing.

1053. Computer Science II 3(3-0) Prerequisite: Minimum grade of C in CMPS 1043 & MATH 1233
A continuation of the development of a disciplined approach to the design, coding, debugging and testing of programs. Introduction to algorithmic analysis, recursion, data structures and sorting mechanisms using a high-level language.
2084. Introduction to Computer Architecture 4(3-1) Prerequisite: none. 
An introduction to the components, functions and logical relationships present in current scalar computers, including the central processing unit, different levels of memory, control signals, bus systems, data channels and input/output devices. Also covered are instruction sets and assembly language programming.

2133. Data Structures 3(3-0) Prerequisite: Minimum grade of C in CMPS 1053 and MATH 2333. 
Object-oriented approach to design and analysis of algorithms, particularly those related to the processing of data structures, including trees, graphs, and linked lists. Other techniques include searching, sorting, and merging. Discussion of legal, social, and ethical issues.

4103. Introduction to Operating Systems 3(3-0) Prerequisites: Minimum grade of C in CMPS 2084 and CMPS 2133. 
An introduction to operating systems for contemporary multitasking, single processor computers. Topics include processes, process management and scheduling, interprocess synchronization and communication, memory management and file management. Selected theory and concepts are supplemented with an examination of their implementation in contemporary operating systems. Discussion of legal, social, and ethical issues.

Graduate Classes

Basic requirements: 
Leveling classes, if necessary, plus 36 credit hours, including all core classes.

Core requirements

5133. Advanced Computer Architecture 3(3-0) Prerequisites: CMPS 2084 
A comprehensive study of scalable and parallel architectures. Topics include principles of parallel processing, advanced processors, cache and memory technology, and pipelining techniques. Shared memory, vector and SIMD supercomputers are examined.

5143. Advanced Operating Systems 3(3-0) Prerequisites: CMPS 4103 
Application of software techniques used in constructing operating systems for large multiprogram batch and timesharing computer systems. Includes memory management, processor scheduling, concurrent processes, job scheduling, I/O device management and information management.

5153. Advanced Software Engineering 3(3-0) Prerequisites: Twelve hours of graduate computer science. 
An advanced study of the process of creating software systems with consideration on techniques of system management, integration and testing.

5243. Algorithm Analysis 3(3-0) Prerequisite: CMPS 213 and MATH 1634. 
A study of the design and analysis of algorithms for the processing of numeric and non-numeric data. Searching and sorting algorithms; graph processing algorithms; finite Fourier transform applications to integer and polynomial arithmetic; pattern matching and fast matrix multiplication; NP completeness. Introduction to current literature on algorithm analysis.
5113. Advanced Programming Language Concepts 3(3-0) Prerequisites: CMPS 2084 and concurrent enrollment in CMPS 2133
Techniques for specifying the syntax and semantics of programming languages. Language concepts such as data structuring, information binding, control structures, execution environments and extensibility are examined by studying scientific, data processing, list processing and multi-purpose languages. Programming assignments in the various languages.

**Electives**

5203. Embedded Systems 3(3-0) Prerequisites: CMPS 2084
A study of integrated hardware/software solutions in computational systems with limited resources. It includes the design and implementation of basic intermodule functions such as device drivers, interrupt handlers and real-time operating system basic routines.

5213. Wireless Computer Communication and Networks 3(3-0) Prerequisites: Consent of the instructor and concurrent enrollment in CMPS 2133.
An introduction to hardware and software used in wireless data communication systems. Includes transmission fundamentals, protocols, communication technology, error control and local area networks.

5223. Language Translators and Interpreters 3(3-0) Prerequisite: Consent of the instructor.
A study of context-free and LR(k) grammars, parsing, lexical analysis, syntax and semantics, code generation, optimization, and error diagnostics.

5233. Software Quality Assurance 3(3-0) Prerequisite: CMPS 5153.
A study of software engineering activities that assure and measure software quality. Encompasses formal inspections, collection of product and process metrics, and use of metrics in making predictions, configurations management, testing techniques and formal methods. Emphasis is on concepts and practices that improve software quality.

5253. Expert Systems 3(3-0) Prerequisites: CMPS 1053 and MATH 2333.
A study of the formulation, design, implementation, and application of rule based systems. Areas of study include knowledge representation, inference mechanisms, knowledge acquisition, user interfaces, and implementation environments (shells, languages, etc).

5303. Advanced Database Management Systems 3(3-0) Prerequisite: CMPS 2133.
The theory of database design including hierarchical, network and relational data models; functional dependencies; normal forms, query optimization and file structures.

5313. Automata Theory 3(3-0) Prerequisites: CMPS 2133 and MATH 2333.
The study of deterministic and non-deterministic finite automata. Formal languages and grammars including Chomsky's Hierarchy, regular and context free. Pushdown automata, Turing machines and the computability problem.

5323. Computer Methods in Applied Science 3(3-0) Prerequisite: Consent of the instructor.
Selected topics from the theory and practice of using digital computers for approximating functions, solving systems of linear and nonlinear equations, and solving ordinary and partial differential equations. May be repeated with consent of graduate coordinator.
5333. Discrete System Simulation 3(3-0) Prerequisites: CMPS 5243 and STAT 3573 or equivalent.
Introduction to computer simulation of waiting-line models and selected simulation programming languages. Simulation methodology, including generation of random numbers and variates and validation of simulation models and results.

5353. Topics in Computer Graphics 3(3-0) Prerequisites MATH 2333, and 1 semester calculus.
An in-depth study of the design and implementation of an interactive graphics system. The mathematics of graphics and considerations for implementation on raster graphics hardware will be examined. Students will program and implement an interactive graphics system on a microcomputer.

5433. Topics in Parallel and Distributed Systems 3(3-0) Prerequisite: Consent of the instructor.
Selected topics from parallel and distributed programming techniques, and parallel and distributed computer systems. May be repeated with consent of program coordinator.

5443. Advanced Topics in Computer Science 3(3-0) Prerequisite: Consent of the instructor.
Selected topics from advanced computer science. May be repeated with the consent of the graduate coordinator.

5993. Problems 3(3-0)

6901. Seminar 1(1-0)
Reports and discussion of current research and of selected topics of current interest in the discipline.

6903. Research 3(1-2) Prerequisites: 18 hours of graduate computer science classes
Study of techniques on design, development and preparation of research papers.

Suggested schedule for non-computer science graduates:

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPS 1043</td>
<td>CMPS 1053</td>
<td>CMPS 2133</td>
</tr>
<tr>
<td>CMPS 2084</td>
<td>CMPS 4103</td>
<td>CMPS 5143</td>
</tr>
<tr>
<td>MATH 2333</td>
<td>CMPS 5153</td>
<td>Elective not dependent upon CMPS 2133</td>
</tr>
</tbody>
</table>

Semester 4 and beyond - Any classes with pre-requisites satisfied.