COTS Assessment of Assessment
September 2006

Department: Computer Science

Chair: Jim Schwing

Program review year - previous: 2004-2005
Program review year - next: 2009-2010

List of department degree programs:

Bachelor of Science, Computer Science

Affiliated interdisciplinary programs:

Bachelor of Science, Computer Engineering Technology

Attached documents:

- ✓ Program goals
- ✓ Student learning objectives - program level
- ✓ Documents correlating the program objectives with specific courses
- ✓ Assessment plan
- ✓ Assessment results, notes about how curriculum has been modified

I. Departmental Mission and Program Goals

A. Departmental Mission Statement

The Computer Science Department's mission is to prepare students for living in and helping build a society increasingly affected by information technology. From basic technological literacy to the development of problem-solving skills, the General Education program will prepare students to understand the ethical and social impact of computing on society and the use of computing technology as they contribute to the modern world. Through experience, knowledge, and skills ranging from basic theory through experimental techniques to engineering methodology, the Computer Science degree programs will prepare students to be productive citizens who contribute in many ways to the information society that forms the backbone of much of the industry and business in the state of Washington. Computer Science faculty and students working in partnership with each other and with interdisciplinary colleagues will help address significant local, regional, and national problems through the use of this flexible, robust discipline.

B. General Description of the Department

The Computer Science Department seeks to educate graduates that will be both productive and creative in modern business and industry environments. Studies range from theory through experimental techniques to engineering methodology. This program exposes students to aspects of each of these disciplines and fosters an appreciation and understanding of each. Research, laboratory, and on-the-job experiences complement student classroom studies.

The field of computer science can trace its foundation to both mathematics and engineering methodology with the emphasis on practical experience. Using this philosophy, the Computer Science Department has designed a unique curricular model that seeks to provide an increased relevance to the real world. The Senior Project - capstone course - expands upon the experimental and design approach by introducing student to the creativity and productivity concerns required for business and industrial development.

The Department of Computer Science offers a degree program leading to a Bachelor of Science in Computer Science. The Department of Computer Science also jointly offers a program with the Industrial Engineering Technology (IET) Department in the College of Education and Professional Studies leading to a Bachelor of Science in Computer Engineering Technology. The Department also offers a Computer Science Minor and an Applied Computer Science Minor. All these programs are offered on the Ellensburg campus. In addition, the Computer Engineering Technology program is being offered at CWU Pierce County Center. Note, due to the similarity of the department's major and minor programs and the department's part of the engineering technology program, the department uses a single set of programmatic goals and objectives.

The Department is located in Hebeler Hall, which houses the department's state-of-the-art computing facilities. Computer Science faculty members have compiled an outstanding record as scholars and instructors. Members of the faculty teach all courses. (Specifically, there are no courses being taught by teaching assistants and only tenure-track faculty members teach major courses.) Students are offered access to a wide-ranging computer science curriculum. Specialties in areas such as software engineering, information systems, computer systems, scientific computing and artificial intelligence are available.

The Computer Science Department is one of 12 departments in the College of the Sciences. The department is small with five tenure-track faculty members, one computer systems

engineer, and one senior secretary. The department hosts the Imaging Research Lab that employs a senior scientist and a staff programmer who are funded from faculty generated grants. Depending upon grant-generated release time, the department hires adjunct faculty to help cover general education and technical writing courses.

C. Programmatic Goals

1. Identification and description major program activities that enable goals and objectives to be reached.
2. Identification of the data used to measure (assess) whether objectives are achieved.

Goal I. Promote the role of computer science and interdisciplinary technology-based studies in undergraduate education at Central Washington University.

Activities

A. Work with the ITAM (Information Technology and Management) Department to support General Education through the development of basic skills courses in computer literacy and by defining common learning outcomes.
B. Work with the ITAM Department to coordinate programs and courses in business-related technology studies.
C. Expose general education students to problem-solving groups that develop technology-based solutions to problems.
D. Work with science, mathematics and technology departments to support interdisciplinary research and teaching across the university.
E. Continue to work to improve computing infrastructure in support of general education and service instruction.

Assessment

A. The General Education Committee of the Faculty Senate supervises the coordination of the courses developed for computer literacy. Student performance on exams in each of five content areas is used to assess their achievement. The department has also worked with ITAM and the Associate VP for Undergraduate Studies to develop a new, non-credit, entry level literacy course to address problems of students with almost no computer background who are unable to succeed at the basic computer literacy course. This course has been approved and is currently pending being scheduled.
B. The three departments met to ensure that programs and courses complement each other and will continue to do so.
C. Recent changes in the general education course CS 105, Logical Basis of Computing, do exactly this by having problem solving teams develop algorithmic solutions to problems.
D. The chair meets regularly with other science, mathematics and technology departments to ensure that support courses are meeting their needs. Faculty and students are currently involved in interdisciplinary research with Chemistry, Geography, Geology, and Mathematics.
E. With the help of the College of Sciences and Information Technology Services, the department has been successful in developing new labs for both general education and major-related instruction.

Goal II. Offer undergraduate programs that train students as computer specialists with a fundamental understanding of technology.

Activities

A. Strengthen student scholarship through a rigorous, inquiry-driven curriculum – this includes general education and major-related courses.

B. Build on strengths of the computer science and computer engineering technology programs, including support of new growth areas (for example, web programming and artificial intelligence) that are relevant to regional scientific and technical needs.
C. Integrate problem solving and research into the curriculum at all levels.
D. Promote undergraduate research across campus through continued undergraduate research projects and participation in SOURCE and other undergraduate research conferences.
E. Recognize the success of students in academic and scholarship endeavors annually.

Assessment

A. Our assessment of the curriculum is described below.
B. Over the last several years, we have added a web-programming focus area and beefed up our artificial intelligence focus area. We are currently working on adding a network focus area.
C. The general education course CS 105 has been revamped to integrate team problem solving techniques with introductory programming. Core courses in the computer science curriculum have always included a problem-solving component while most advanced courses include course projects that encourage student research.
D. Student/faculty interaction in scholarship is one of the real success stories of the department. The numbers of students involved in SOURCE, senior projects, service projects, conference presentations, and student publications continue to be exceptionally high. Recent gifts to the department have allowed us to set up a undergraduate research fund to help defray equipment, software, and travel expenses for students involved in undergraduate research.
E. The department holds an annual end-of-the-year recognition gathering that honors the contributions of students, faculty, and staff. This includes recognizing outstanding graduates, scholarship winners, and students who have made successful research presentation(s) during the year.

Goal III. Maintain an intellectually stimulating learning environment where diverse perspectives are valued and encouraged.

Activities

A. Use scholarship support and participate in recruiting activities seeking to increase representation of underrepresented groups (women and minorities) in the computer science programs.
B. Encourage mentoring of students by faculty.
C. Increase the understanding of importance of service projects and professional ethics.
D. Provide opportunities for students to have scientific discussions with faculty in non-lecture settings.
E. Expand instructional laboratory space and upgrade lab equipment. Continue to work to improve computing infrastructure in support of major courses and student scholarship.

Assessment

A. The department has been fortunate to receive CSEMS scholarship support from the National Science Foundation. Recruiting for this scholarship specifically targeted women and minority students (nine women and five minorities thus far).
B. The department believes that one component of success for undergraduate students lies in a strong advising program. Students in all programs (major, pre-major, and minor) are required to meet at least once a quarter with their advisor. In addition, the department runs a mentoring program for the CSEMS scholarship recipients. These students meet weekly with a faculty mentor with discussion topics ranging from academic concerns to research projects.

C. The department will work to expand its successful undergraduate research program to include more interaction with Academic Service Learning. Projects chosen for the senior capstone courses will provide service either to a university office or to the community. All computer science students will take the senior seminar class where a major learning object is an active understanding of professional ethics.
D. Faculty interact with project teams regularly in a non-lecture setting. Two primary examples are the senior capstone course and the senior colloquium. In addition, one of the successes of the computer science program is undergraduate research. A summary of the numbers of students involved is contained in Section III below.
E. By obtaining equipment grants, by judiciously using research grant and overhead money, and with the help of the College of Sciences, Information Technology Services, the department has been successful in developing new labs with new equipment for instruction of students in the major and in support of faculty and student scholarship. Work with appropriate departments to move instructional technology into the labs.

Goal IV. Sustain a productive team of faculty and staff.

Activities

A. Allow faculty to carve out roles within the department that play to their strengths, particularly in the areas of teaching and scholarship.
B. Through the annual review of faculty, develop plans that support effective teaching and value the contribution of scholarship excellence in enhancing undergraduate education.
C. Build research lab space to support student and faculty projects.
D. Maintain a department profile that supports instruction in the core disciplines of computer science with faculty who are active in scholarship.

Assessment

A. This is particularly important in a small department like Computer Science. Of the five faculty, two make their contribution to the undergraduate program their primary emphasis, two have chosen a role that emphasizes their research interests, while the chair's time is divided fairly evenly among administration, teaching and scholarship activities.
B. The department believes that faculty are most likely to maximize their professional development when they undertake an honest look at where they stand and where they are headed. To that end the Computer Science department conducts an annual review of the achievements and goals of all faculty. This includes retention review, tenure review, and post tenure review as appropriate. The review looks at the traditional areas of evaluation: teaching, scholarship and service.
C. Five years ago, the department had no lab space for research or student projects. We now have one dedicated research lab, one shared research lab space and two special projects labs. By using grant request and overhead funds, the department has built the Imaging Research Lab dedicated to imaging and visualization research. The department has set up lab space for accessibility research. This space is shared with tutoring space for our student ACM club. Finally the department has set up lab space for students to experiment and gain experience in networking, alternative operating systems, data mining, and parallel and distributed computing.
D. The staff delivers a curriculum that closely matches the core recommendations found in Curriculum 2001. In addition, the faculty have been extremely active in scholarship for a small department at a university that emphasizes teaching.

Goal V. Play a leadership role in scholarship by making basic and relevant scientific contributions to our respective sub-disciplines.

Activities

A. Encourage faculty to integrate undergraduate students in their scholarship activities.
B. Support grant writing by faculty through whatever means possible, including release time.
C. Support participation in professional meetings, financially when possible.
D. Acknowledge scholarly productivity by allowing principal investigators to utilize the majority of returned overhead funds in innovative ways that support the department's research programs.

Assessment

A. This has been a particular success for the department.
B. With the support of the Dean, the department has been able to offer new tenure track faculty a two course release their first year to help establish their research programs. Faculty regularly agree to take on additional non-compensated teaching assignments. For example, mentoring senior project teams is always covered by contact course beyond the basic teaching assignment. The department tracks these contributions and when possible reimburses them with the particular objective of allowing faculty some research time.
C. The department has been fortunate in building its "Ledger 2" (non-state designated) funds over the last five years through grant overhead funds and the summer program. A significant part of these funds are dedicated to faculty scholarship activities.
D. As noted in part C, the department has been fortunate in building its "Ledger 2" (non-state designated) funds over the last five years through grant overhead funds and the summer program. Most of the overhead funds are put at the disposal of the principal investigator that generated the funds. The result has allowed the department to help build and equip the Imaging Research Lab and hire a Senior Scientist for the Lab.

Goal VI. Build an interdisciplinary research "Area of Distinction" and an associated Masters Degree program in geospatial information technologies.

Activities

A. Team up with the departments of Geography, Geology, and Mathematics to integrate the recognized national strengths of these programs into a university recognized "Shpere of Distinction."
B. Complete a draft proposal for a Masters degree in this area to be housed in the Computer Science Department.
C. Develop a curriculum for this Masters degree.
D. Establish and explore industry contacts for research support of new Master's program
E. Obtain faculty needed to sustain a high level of grant-writing and research activity, including continued support for the Imaging Research Lab.

Assessment

A. Such a program has been developed and will be revamped for the next period of consideration.
B. A NOI has been developed at this time.
C. This is will be completed this AY.
D. This is will be completed this AY.
E. This is an on-going goal of the department.

II. Programmatic Outcomes

A. Graduates will have a reasonable level of understanding of each of the subject areas that define the discipline as well as the interrelationships that exist among them: algorithms, architecture, artificial intelligence and robotics, data structures, database and information retrieval, human-computer interaction, operating systems, programming languages, and software engineering.
B. Graduates will have the ability to utilize appropriate theoretical constructs: definitions, and axioms, theorems, proofs, and interpretation of results.
C. Graduates will have the ability to utilize appropriate abstractive constructs: hypothesis formation, data collection, modeling and prediction, experimental design, and analysis of results.
D. Graduates will have the ability to utilize appropriate design constructs: requirements analysis and specification, design, implementation, and testing.
E. Graduates will be exposed to ethical and societal issues associated with the computing field.
F. Graduates will be familiar with recent technological and theoretical developments, general professional standards, and have an awareness of their own strengths and limitations as well as those of the discipline itself.
G. Graduates will be aware of the history of computing, including those major developments and trends - economic, scientific, legal, political, and cultural - that have combined to shape the discipline.
H. Graduates will be able to appreciate the intellectual depth and abstract issues that will continue to challenge researchers in the future. They should have a strong foundation on which to base lifelong learning and development.
I. Graduates will have the necessary background for entry into graduate study.
J. Graduates will have the ability to communicate effectively.

III. Correlating program objectives with specific courses

1. Entering the program.

The department requires that pre-majors complete a collection of six courses with a 2.50 GPA. Specifically, the six courses are: Eng 101 & 102 – English I & II, Math 172 – Calculus I, CS 110 & 111 – Programming Fundamentals I & II, and CS 301 – Data Structures. The purpose is to ensure that students will have the necessary language, mathematics, and problem solving skills to successfully complete the computer science program.

2. Correlating courses with objectives

1. All students participate in the core curriculum. In addition to the CS 110, 111, 301 and Math 172 that are part of the entry requirements, the core curriculum consists of the following courses: CS 112 – Foundations of Computer Science, CS 302 – Advanced Data Structures, CS 311 – Computer Architecture I, CS 312 – Computer Architecture II, CS 325 – Technical Writing in Computer Science, CS 361 – Principles of Language Design I, CS 362 Principles of Language Design II, CS 420 – Database Management Systems, CS 427 – Analysis of Algorithms, CS 446 – User Interface Design, Math 260 – Sets and Logic, CS 470 – Operating Systems, and Math 330 Discrete Mathematics. The core curriculum is used to help determine the following student outcomes:
    A. Graduates will have a reasonable level of understanding of each of the subject areas that define the discipline as well as the interrelationships that exist among them: algorithms, architecture, artificial intelligence and robotics, data

structures, database and information retrieval, human-computer interaction, operating systems, programming languages, and software engineering.

B. Graduates will have the ability to utilize appropriate theoretical constructs: definitions, and axioms, theorems, proofs, and interpretation of results.
C. Graduates will have the ability to utilize appropriate abstractive constructs: hypothesis formation, data collection, modeling and prediction, experimental design, and analysis of results.
F. Graduates will be familiar with recent technological and theoretical developments, general professional standards, and have an awareness of their own strengths and limitations as well as those of the discipline itself.
G. Graduates will be aware of the history of computing, including those major developments and trends - economic, scientific, legal, political, and cultural - that have combined to shape the discipline.
H. Graduates will be able to appreciate the intellectual depth and abstract issues that will continue to challenge researchers in the future. They should have a strong foundation on which to base lifelong learning and development.
J. Graduates will have the ability to communicate effectively.

2. All seniors participate in a two-term capstone sequence of courses, CS 480 and 481. The senior capstone courses are used to help determine the following student outcomes:
   B. Graduates will have the ability to utilize appropriate theoretical constructs: definitions, and axioms, theorems, proofs, and interpretation of results.
   C. Graduates will have the ability to utilize appropriate abstractive constructs: hypothesis formation, data collection, modeling and prediction, experimental design, and analysis of results.
   D. Graduates will have the ability to utilize appropriate design constructs: requirements analysis and specification, design, implementation, and testing.
   H. Graduates will be able to appreciate the intellectual depth and abstract issues that will continue to challenge researchers in the future. They should have a strong foundation on which to base lifelong learning and development.
   I. Graduates will have the necessary background for entry into graduate study.
   J. Graduates will have the ability to communicate effectively.

   In these courses, students as part of teams develop a piece of software for an external client. Students are responsible for all aspects of the project from the initial requirements writing to the final acceptance test. All faculty are involved in the evaluation of these projects.

3. All seniors participate in a senior colloquium, CS 489. The senior seminar is used to help determine the following student outcomes:
   E. Graduates will be exposed to ethical and societal issues associated with the computing field.
   J. Graduates will have the ability to communicate effectively.

   Students in this class go through an in-depth study of professional codes of ethics, ethical systems and reasoning and case studies. They also are responsible for preparing a major research paper and making an oral presentation on it. Faculty alternate supervising the seminar.

4. Once a decade, computer professionals from business, industry, and education get together and analyze the needs and trends in computer education. The most recent curriculum review was published with the title Curriculum 2001. The department commenced a total curriculum review in 2000 based on advanced releases of the

document. The review was completed with just after Curriculum 2001 was issued and the new curriculum was published for students beginning in the 2002 academic year. The core courses listed in the first bullet in this section cover much of the CS Body of Knowledge defined by Curriculum 2001. The table below represents an analysis of Computer Science Department relative to the Computer Science Body of Knowledge found in Curriculum 2001.

Table 1. Analysis of Computer Science Department relative to the CS Body of Knowledge found in Curriculum 2001

		CWU Core Courses																								
	Appendix A: CS Body of knowledge	CS 110 Programming Fundamentals I	CS 111 Programming Fundamentals II	CS 301 Data Structures	MATH 172.1 Calculus	CS 112 Foundations of CS	CS 302 Advanced Data Structures	CS 311 Computer Architecture I	CS 312 Computer Architecture II	CS 325 Technical Writing in CS	CS 361 Principles of Programming Languages	CS 362 Principles of Programming Languages	CS 392 Lab Exper. in Teaching in CS	CS 420 Database Management Systems	CS 427 Algorithm Analysis	CS 446 User Interface Design	CS 470 Operating Systems	CS 480 Software Engineering	CS 481 Software Engineering Project	CS 489 Senior Colloquium	CS 492 Lab Exper. in Teaching in CS	MATH 260 Sets and Logic	MATH 330 Discrete Mathematics	Min Time Requirement	Total Provided	Difference
DS1	Functions, relations, and sets														1							12	10	6	23	17
DS2	Basic logic	2	1						2						2							3	0	10	10	0
DS3	Proof techniques														8							10	10	12	28	16
DS4	Basics of counting																					3	2	5	5	0
DS5	Graphs and trees			2			4								3								8	4	17	13
DS6	Discrete probablility														2								2	6	4	-2
PF1	Fundamental programming constructs	10				1		3																9	14	5
PF2	Algorithms and problem-solving	2	1	2		1	2	4										5						6	17	11
PF3	Fundamental data structures	1	1	8			8																	14	18	4
PF4	Recursion			3				1							2								5	5	11	6
PF5	Event-driven programming		1													4								4	5	1
AL1	Basic algorithm analysis		1	3		1	2								6									4	13	9
AL2	Algorithmic strategies		1	3		1	3								6									6	14	8
AL3	Fundamental computing algorithms	2	2	6			6																	12	16	4
AL4	Distributed algorithms																							3	0	-3
AL5	Basic computability			1		1	1								3									6	6	0
AR1	Digital logic and digital systems					2			5															6	7	1
AR2	Machine level representation of data	1				4			2															3	7	4
AR3	Assembly level machine organization					2		5	5															9	12	3
AR4	Memory system organization and architecture								5															5	5	0
AR5	Interfacing and communication								3															3	3	0
AR6	Functional organization								5															7	5	-2
AR7	Mulitiprocessing and alternative architectures								2															3	2	-1
OS1	Overview of operating systems					1											6							2	7	5
OS2	Operating system principles																5							2	5	3
OS3	Concurrency																5							6	5	-1
OS4	Scheduling and dispatch																4							3	4	1
OS5	Memory management																5							5	5	0
NC1	Introduction to net-concentric computing					1																		2	1	-1
NC2	Communication and networking																							7	0	-7
NC3	Network security					2																		3	2	-1
NC4	The web as an example of client-server computing																							3	0	-3
PL1	Overview of programming languages	1				1					3													2	5	3
PL2	Virtual machines	1										2												1	3	2
PL3	Introduction to language translation					1					2	4												2	7	5
PL4	Declarations and types	2				1					3													3	6	3
PL5	Abstraction mechanisms	1	1								2	2												3	6	3
PL6	Object-oriented programming	5	7			1						4												10	17	7
HC1	Foundations of human-computer interaction															6								6	6	0
HC2	Building a simple graphical user interface		3													5								2	8	6
GV1	Fundamental techniques in graphics																							2	0	-2
GV2	Graphic systems	1														1								1	2	1
IS1	Fundamental issues in intelligent systems					1																		1	1	0
IS2	Search and constaint satisfaction																							5	0	-5
IS3	Knowledge representation and reasoning																							4	0	-4
IM1	Information models and systems													1										3	1	-2
IM2	Database systems													3										3	3	0
IM3	Data modeling													4										4	4	0
SP1	History of computing	1				1			2										1					1	5	4
SP2	Social context of computing																	2	1	1				3	4	1
SP3	Methods and tools of analysis (ethics & society)																			2				2	2	0
SP4	Professional and ethical responsibilities																		1	2				3	3	0
SP5	Risks and liabilities of computer-based systems																		1	1				2	2	0
SP6	Intellectual property																			3				3	3	0
SP7	Privacy and civil liberties	1	1																	1				2	3	1
SE1	Software design	1	1			1												5						8	8	0
SE2	Using APIs	2	2													5								5	9	4
SE3	Software tools and environments	1														1			1					3	3	0
SE4	Software processes	1																4						2	5	3
SE5	Software requirements and specifications																	4						4	4	0
SE6	Software validation																	3						3	3	0
SE7	Software evolution					1												2						3	3	0
SE8	Software project management																	3						3	3	0
	Totals	36	23	28	0	25	26	13	31	0	10	12	0	8	33	22	25	28	5	10	0	28	37	280	400	120
																									Total Over	154
																									Total Under	-34

IV. Assessment plan

The department specifically considers the results of the following in measuring and assessing the student learning outcomes, reviewing the curriculum and making alterations.

1. All seniors participate in the Major Field Test published by ETS. In addition to an overall score, the test provides scores on three (formerly four) major indicators in undergraduate computer science education.
2. All seniors participate in a two-term capstone sequence of courses. Results of this sequence course form part of the consideration of our assessment of student learning outcomes.
3. All seniors participate in a senior colloquium. Results of this course form part of the consideration of our assessment of student learning outcomes.
4. All seniors participate in exit interviews. Feedback from these interviews form part of the consideration of our assessment of student learning outcomes.
5. The department interviews recent graduates. Results of these interviews form part of the consideration of our assessment of student learning outcomes.
6. Many students participate in undergraduate research, independent studies, cooperative education and internships. The faculty considers the effectiveness of these projects and activities in furthering the goals of the students.
7. All students participate in the core curriculum. Review of these courses and student performance help measure the breath of the program.
8. The faculty conducts an annual peer review of instruction. The primary purpose of this review is two-fold. In addition to reviewing faculty performance, it allows the faculty to take an in-depth look at courses.

As noted above, the department also reviews the program curriculum with respect to the recommendations of current experts in the field of computer science education, the most recent being Curriculum 2001. The annual peer review noted in the last point above ensures that the department will thoroughly review the curriculum every three years.

Participation of all seniors is assured as all measures are tied to specific course requirements (this includes participation in the MFT and exit interviews that are part of the course requirements in the senior colloquium).

V. Assessment results, notes about how curriculum has been modified

Over the last year the department noted several concerns and several positives in assessing the program curriculum. I will begin by summarizing the changes and follow that with a quick list of the positives.

Changes

1. Senior project courses – CS 480 and 481 – a redesign will be undertaken to increase the breadth of available projects, to provide increased emphasis an the testing component, and to include a different collection of documents for the research oriented projects.

2. A networking focus area will be developed for our students by combining CS theory courses with IT application courses.

3. A new course will be developed in network security to complement courses offered in IT and provide expanded resources and opportunities to our students.

4. The faculty will investigate building a follow on course to Math 260 and 330.

Positives

1. The material of CS 470 was found directly applicable many work situations.

2. Increased lab space and equipment and travel funds have been used to good purpose by our undergraduate students.

In what follows, I will describe what I feel is the major assessment factor in making our decision. Of course, few if any of these assessment results are affected by just one of the factors.

1. All seniors participate in the Major Field Test published by ETS. In addition to an overall score, the test provides scores on three major indicators in undergraduate computer science education.

   Currently, approximately 150 computer science departments across the country use this test as part of their assessment process. The faculty have reviewed the list of institutions participating in the computer science MFT and feel it provides a fair cross section of computer science programs, many from what are considered peer-institutions.

Table2. Average MFT scores for students in the Central Computer Science Program along with the national percentile ranking of these averages.

	01-02		**02-03**		**03-04**		**04-05**		**05-06**	
	Score	Percentile	Score	Percentile	Score	Percentile	Score	Percentile	Score	Percentile
Num. Stu.	36		31		28		22		27	
Overall	143.5	39	152.2	71	151.6	71	145.3	45	153.1	75
Programming	43.6	25	53.4	71	54.2	63	51.1	48	60.0	82
Comp. Org.	26.9	37	33.0	77	38.2	91	31.3	71	40.2	92
Theory	35.0	28	43.6	63	43.7	63	37.4	33	44.3	63
GPA – avg.	3.22		3.39		3.18		3.19		3.66	

The annual review of the MFT results reveals reasonably consistent results with a general upward trend. The department did not initialize curriculum changes based upon these results.

2. All seniors participate in a two-term capstone sequence of courses. Results of this sequence course form part of the consideration of our assessment of student learning outcomes.

   At this year's annual review of the capstone courses, two concerns were raised. First, the breadth of projects seemed to be narrowing, and second, there seemed to be a continuing problem designing technical documents to be produced by teams working on more research oriented projects. It was decided that Ed Gellenbeck would take on a redesign of the courses to address these concerns.

   A third change will also be made in these courses that arose due to assessment number five below.

3. All seniors participate in a senior colloquium. Results of this course form part of the consideration of our assessment of student learning outcomes.

   A review of the results of the senior colloquium demonstrates that students are demonstrating practical knowledge of ethics. Also, via this class and the senior project class, students are demonstrating adequate written and oral communications skills.

4. All seniors participate in exit interviews. Feedback from these interviews form part of the consideration of our assessment of student learning outcomes.

   Two strong recommendations arose during this years exit interviews. First an interest in some of the more practical aspects of networking and a growing interest in security. As part of investigating expanded opportunities for our students, we noted a growing practical program in both networking and security in ITAM. Grant Eastman and Jim Schwing met with Dave Rawlinson from ITAM and talked about a sequence of courses that could meet both the theoretical and practical needs of students in both programs. This included the possibility of sharing lab space and the mechanics of making that happen. The upshot is that a specialty area was developed for our students and Grant will design a theoretical course in network security that would complement the practical IT courses.

5. The department interviews recent graduates. Results of these interviews form part of the consideration of our assessment of student learning outcomes.

   Interviews with recent graduates this year lead to one major kudos and one recommendation for change. The Kudos was received for the material in our CS 470 Operating systems course along with its applicability in the job market.

   The recommendation for change was relative to our senior project course. More and more of our graduates are being hires as software testers. It was pointed out that currently this tends to be a minor portion of the project. As mentioned above Ed Gellenbeck will make this a third point to consider in redesigning the course.

6. Many students participate in undergraduate research, independent studies, cooperative education and internships. The faculty considers the effectiveness of these projects and activities in furthering the goals of the students.

   The faculty was pleased to note that the already strong participation in undergraduate research is on the rise. There were more active research groups and presentations at SOURCE, and regional and national conferences. The department has succeeded in building an additional research lab to support Ed Gellenbeck's new project and swapping research space to support distributed database activities and increase space for the Imaging Lab. The department will continue to provide funds for research equipment and travel to conferences.

7. All students participate in the core curriculum. Review of these courses and student performance help measure the breath of the program.

   The faculty are still concerned with the mathematical preparation of the students. We noted that the Math department did not appear to be in a position to add a course to the 260, 330 sequence that we once talked about. Boris Kovalerchuk and Razvan Andonie have decided to take up the task of seeing if it is possible to design a course that takes up after the 330 course that might still provide tools in a timely fashion.

8. The faculty conducts an annual peer review of instruction. The primary purpose of this review is two-fold. In addition to reviewing faculty performance, it allows the faculty to take an in-depth look at courses.

   Virtually, all the reviews described above were finalized during the annual review of instruction.