

**UNIVERSITY OF WISCONSIN-WHITEWATER
FORMAT FOR AUDIT AND REVIEW SELF-STUDIES
UNDERGRADUATE PROGRAMS**

Program Title: Management Computer Systems (MCS) **Review Date:** 2004-2005

Those programs in which Audit and Review for the undergraduate and graduate programs occurs during the same academic year must submit separate self-studies for the undergraduate and graduate programs (total of two self-studies).

*Attach Audit and Review Evaluation Report from last review as Appendix A.
Attach a list of any accreditation that the program has attained as Appendix B.*

I. Program Highlights/Initiatives

- A. Overview the current curriculum, including options available within the program (e.g., discussion of the different emphases).

The MCS Undergraduate program is a cross-disciplinary program offering a BS degree in the College of Letters and Sciences (L & S) and a BBA degree in the College of Business and Economics (COBE). There was a no-minor option and a minor option in the BS degree but that was changed in 2003-2004 so that all BS students now have minors. The no-minor option has been replaced with roughly an equivalent Computer Science minor option.

The MCS core curriculum is the same for both degrees and consists of 8 courses plus one MCS elective. Courses are taught by faculty from the Mathematics and Computer Sciences Department (L & S) and the Information Technology and Business Education (IT BE) Department (COBE). The IT BE department is a new department formed at the beginning of the 2003-2004 school term. Prior to that the MCS COBE faculty were part of the Management Department.

- B. List any special recognition that the program has received during the review period.

In 2000 and 2003 the MCS Program was granted the Four Year Institution Award by the Association for Information Technology Professionals (AITP) for being the top four year computing program in the nation. These were the only years that the program was eligible due to a requirement that the winner sit out for two years. This continues an impressive track record where the program has won the award for a total of seven times.

In 2000, 2001 and 2002 the MCS Program was chosen to be its nominee for the UW System Regents Teaching Award.

MCS faculty member Dr. Kane was chosen as the Advisor of the Year in 2002-2003 by the College of Letters and Sciences.

The Student Chapter of the AITP has won many honors including the Student Chapter Outstanding Performance Award, for 4 out of the 5 audit years, which is the highest award the parent AITP organization gives to student chapters.

- C. Highlight any new academic assessment initiatives you anticipate for the upcoming review period.

There are a number of new academic assessment initiatives that will be implemented in the 2004-2005 school term. They include (1) expanded exit surveys, (2) in class surveys, and (3) learning outcome assessments.

Expanded Exit Surveys: beginning in Fall 2004, graduating MCS majors will be asked to evaluate how well the program met its learning objectives as part of the standard exit survey all students must now complete. The seven MCS learning outcomes objectives are described below (see Section C.1).

In Class Surveys: beginning in Fall 2004, students in all MCS classes will be surveyed at the end of the term on how well the course met its stated learning objectives. There will be one question per objective. Objectives will be clearly stated in the syllabus for the course.

Learning Outcomes: beginning in Fall 2004 the MCS program will attempt to measure learning outcomes by evaluating two key capstone experiences.

The programming capstone experience is a simulation programming project that is required of all students in MCS 231. This challenging project tests student knowledge and skills from CS 172, MCS 220, and MCS 231. A MCS faculty member other than the one teaching the course will evaluate a random sample of the assignments in terms of their demonstrated learning outcomes on 8-12 key dimensions (e.g., The computer program demonstrates the ability to properly structure a computer program using current standard practices).

The analysis and design capstone experience is the Systems Analysis and Design team project that is completed in MCS 331 and MCS 431. The SAD projects involve students working in teams on actual projects for real clients. It is the closest experience we can give students to what they will be doing after they graduate. It requires students to apply knowledge they obtained in most of the other MCS courses. A faculty member who did not teach the courses will evaluate all of the projects for the semester for their demonstrated learning outcomes on 8-12 key dimensions (e.g., The analysis document demonstrates the ability to model software using currently used modeling methods).

II. Academic Assessment

Attach the program's AR(s) as Appendix C.

A.

B. A. Centrality

1. Describe the centrality of the program to the mission and strategic plan of the University of Wisconsin-Whitewater.

The MCS program is central to the University's mission to provide a range of undergraduate programs and degrees in letters, sciences, the arts, and professional specializations. MCS faculty contribute to the scholarly output of the University and serve as a regional economic resource through its participation in the MCS Business Consortium, the e-Innovate Initiative, and other individual industry projects. The MCS faculty strongly support the University's commitment to providing a positive and inviting learning environment for multicultural students, students with disabilities, and non-traditional students.

2. Explain the relationship of the program to other programs at the University.

The MCS program relies on the Mathematics and Computer Sciences Department to provide key prerequisite courses. In the most recent curriculum revision those courses are CS 172 and CS 181. The MCS Program also accepts some Computer Science courses as a possible MCS elective. MCS L & S faculty teach mathematics and computer science courses in addition to MCS courses. MCS COBE faculty teach graduate and undergraduate management courses as well as supporting a graduate MCS MS degree in addition to teaching undergraduate MCS courses. MCS courses are used by other business programs as electives (e.g., Operations Management).

C.

D. B. Program Goals and Assessment

1. Describe the current program goals and objectives, plus any stated mission for the program itself.

The MCS Mission Statement was reviewed by the MCS faculty and the MCS Advisory Board in November 2001. No changes were made at that time.

MISSION STATEMENT:

MCS will rank among the top three programs from which the employees of our graduates recruit in terms of preparing students to effectively apply modern management techniques to the

identification, design, development, implementation and support of computer based information systems.

Embedded in the Mission Statement are two key MCS Program goals:

- the MCS Program will be a top choice of employers who hire information technology students, and
- the MCS Program will continue to evolve and change in order to provide effective preparation for information technology professionals.

In addition to the Mission Statement, the MCS program has identified 13 activities/objectives that it feels are necessary to meet the goals mentioned above:

- continue undergraduate recruitment
- maintain and enhance undergraduate curriculum
- maintain adequate lab/classroom technical infrastructure
- evolve the undergraduate program
- revise the graduate program
- maintain the MCS Business Partnership Consortium
- experiment with distance learning
- maintain and improve the MCS web site
- seek external funding
- gain feedback from assessment and the Advisory Board
- continue the Minority Scholarship Program
- support the MCS Co-op Program
- continue quality academic advising

2. Summarize the ways by which the curriculum contributes to fulfilling the stated goals and objectives for the program. Explain gaps between specific goals/objectives and the curriculum.

An up-to-date and rigorous curriculum is viewed as essential to prepare MCS students for IT careers and to make them desirable to employers for entry level professional positions.

In order to deliver on this commitment, the MCS program has:

- continued its recruiting efforts (i.e., Computers on Campus Day, participation in majors fairs, collaborating with Washington High School's computing program)
- enhanced its undergraduate curriculum (i.e., two major curriculum changes since 1999),
- maintained its lab/classroom technical infrastructure (i.e., donations by Harley Davidson, Johnson Wax, and State Farm of hardware, software and support combined with a \$28,000 grant from the State of Wisconsin's Technology in Education fund have helped the MCS program keep its lab current and productive)
- continued to collaborate with the Computer Science and Information Technology programs as it looks to make the best use of computing teaching resources on campus
- revised its graduate program (not part of this audit review),
- maintained the MCS Business Partnership Consortium (new members have been added and two major projects have been completed),
- experimented with distance learning – most MCS courses make use of Internet technologies to enhance their effectiveness,
- maintained the MCS web site through several major revisions involving MCS students and faculty,
- sought external funding by creating the MCS Business Consortium which brings approximately \$100,000 a year to the program in the form of money, hardware, software and services,
- sought and used feedback from employer assessments and the Advisory Board to improve its curriculum (see above),
- continued to offer a minority scholarship to qualified students – 3 students received scholarships sponsored by Harley Davidson and an anonymous donor,
- supported the MCS Co-op Program with 46 students placed in full-time positions with leading area firms,

- continued quality academic advising by requiring students to visit their advisors every semester and increasing the quality of the faculty advising, e.g., Dr. Kane was named L & S Advisor of the Year (2002-2003).
3. Summarize the assessment data gathered during the review period. If it is helpful, include data from previous years for comparison purposes. (Use tables where necessary.)

Assessment of the program relative to its mission is done formally with a survey of employers and informally via the program's interaction with the MCS Advisory Board.

Approximately every three years a survey is sent to employers of MCS graduates asking them to list and rank the schools where they recruit entry level information technology professionals. Unfortunately, the 1999 survey did not produce enough usable results to be analyzed. For the 2003 survey, 12 firms listed and ranked their employment preferences. The results from the 2003 survey are summarized below and compared to the 1996 and 1994 survey results. (Note: some firms gave multiple schools the same rank so the percentages don't add to 100%.)

School	1 st Place Ranking			Top 3 Ranking		
	2003	1996	1994	2003	1996	1994
UW-Whitewater	75%	61%	67%	100%	86%	92%
UW-Madison	17%	18%	8%	33%	29%	13%
UW-Eau Claire	8%	4%	17%	17%	21%	33%
UW-Milwaukee				17%	14%	25%
UW-La Crosse				17%	7%	4%
Marquette				8%	7%	4%
Carroll College	8%			17%		
Other UW		7%	4%	33%	14%	8%
Other		11%	4%		43%	29%
No. of firms	12	28	24	12	28	24

The survey data suggest that the MCS Program is meeting its goal of being one of the top (if not the top) programs of employers who seek out IT graduates in our region. One caution is that the number of respondent firms is fairly small. In the next scheduled employer survey (Summer 2006) every attempt will be made to increase the sample size.

Just as important as the formal employer survey, is the on-going input the MCS Program received from its Advisory Board. The MCS Advisory Board consists of representatives from 23 leading Wisconsin firms. Several major issues were brought to the Advisory Board during the Audit review period.

- Improvements in curriculum: the Advisory Board recommended that the subject matter relating to database design, use and administration be increased.
 - Response to IT offshore outsourcing: the Advisory Board recommended that the MCS Program continue its emphasis on rigorous technical preparation along with its practical application to real-world business needs.
 - Integration with other College of Business and Economics computer programs: the Advisory Board supports collaboration and integration of the MCS Program with other college computing programs.
4. Describe how the program contributes to meeting specific state and societal needs. Describe how the program addresses diversity and global awareness issues.

The MCS Program contributes to the economic development of the region and the state in the following ways:

- creates IT graduates who contribute to the success of their private or public employers by their application of the latest in technologies and methodologies,
- supports organizations with small IT applications that have been developed by student teams as part of their MCS Program curriculum (i.e., MCS 331 and 431),
- expands the knowledge that firms and the MCS faculty have in leading-edge technologies and methodologies through the MCS Business Partnership Consortium (in conjunction with the IT BE Department),

- supports the economic development of the region through participation of faculty and students in the e-Innovate initiative (in conjunction with the IT BE Department),
- develops highly skilled students in specialized areas of IT through the MCS Co-op program (MCS 391) and student participation in the MCS Business Partnership Consortium and e-Innovate programs, and
- provides Wisconsin organizations with faculty expertise in a wide-range of specializations.

The IT field provides significant opportunities for women, persons from diverse cultural and ethnic backgrounds, and persons with physical challenges. The MCS faculty wish to increase the numbers of successful students in each of these categories. The numbers of female and minority students in MCS are summarized below.

	1999-00	2000-01	2001-02	2002-03	2003-04
Number of Juniors (Fall)	70	92	87	92	77
Number					
Minority (percentage)	3 (4%)	5 (5%)	2 (2%)	4 (4%)	2 (3%)
Number					
Female (percentage)	10 (14%)	18 (20%)	13 (15%)	11(12%)	12 (16%)
Number of Seniors (Fall)	118	105	96	92	99
Number					
Minority (percentage)	9 (8%)	8 (8%)	8 (8%)	6 (7%)	3 (3%)
Number					
Female (percentage)	18 (15%)	14 (13%)	16 (17%)	14 (15%)	12 (12%)

To increase the number of women in the program, the MCS Program has revised its curriculum based on suggestions from past female students. The program now provides a wider range of IT experiences in its earlier courses. This change is viewed as more in line with female student interests. The MCS faculty also attempted to hire a female faculty member during two faculty searches but was unsuccessful. Hiring a female faculty member is a continuing goal and will be pursued as positions become available.

Cultural diversity during the audit period was increased by the hiring of 3 non-Anglo colleagues to the MCS faculty bringing the number of non-Anglo faculty at one time to 4. Unfortunately, 2 of the faculty members have since taken advantage of other opportunities leaving Dr. Basu and Dr. Gunawardena as continuing faculty members. Cultural and ethnic diversity remains a factor in filling future faculty positions.

During the audit period the MCS Program has had two minority scholarship programs. The Iza Goroff Scholarship was awarded to an Asian-American and the MCS Harley Davidson Minority Scholarship was awarded to two students in the audit time period; one to a Native American and one to an African-American. The MCS faculty continue to seek funding for more scholarships for qualified minority students.

The MCS Program has a long standing relationship with Washington High School in Milwaukee. WHS is a central city school with a specialty program in computing. MCS faculty have been involved in consulting with this program and the school has typically sent large numbers of students to the MCS Computers on Campus Day event. The MCS Program values this relationship and will continue to support it in the future.

Students with physical challenges are encouraged to enroll in the MCS Program. Accommodations are worked out for these students so they can participate in courses. The IT field provides significant employment opportunities for these students when they graduate. As

with the other underrepresented categories, faculty with physical challenges will be encouraged to apply for any open positions.

Dr. Basu was added to the MCS faculty in part because of his experience and interest in global information systems issues. Dr. Basu is on the editorial board of the Journal of Global Information Technology Management. He has also been heavily involved in the Global Business Resources Center.

5. Explain any changes in goals, objectives, and/or curriculum that have occurred since the previous audit and review, indicating how the program has responded to the recommendations listed in the previous audit and review report. Refer to Appendix A as necessary.

Since the previous audit and review the curriculum has had two major modifications.

The first was implemented from 2000-2002 and involved a major shift through-out the curriculum from structured analysis, design and programming methods to object-oriented analysis, design and programming methods. Another major change was that the primary programming language was changed from C++ to Java. These changes were reviewed and supported by the MCS Advisory Board.

The second was when the program was modified to include more emphasis on database subject matter. This change was the result of specific Advisory Board feedback. Two new courses were created : MCS 214 and MCS 314. A new prerequisite was also added: CS 181. These changes give MCS students a three course sequence that builds their database knowledge and skills.

6. Discuss potential revisions to the curriculum (e.g., the development of new academic emphases, new courses, etc.) that you foresee over the next review period in view of projected trends in employment and the development of new technologies, etc.

E.

The MCS faculty continually revise the curriculum with a major revision coming along about every three years. Looking ahead the curriculum may be changed to support further integration with other computing programs and to adjust to changes in technology and methodology. The program will continue to rely on the MCS Advisory Board for guidance in evolving curriculum to meet changing business needs.

F. C. Assessment of Student Learning/Outcomes

1. State performance objectives, specifying what subject matter, cognitive development, and skills the students will demonstrate upon completion of the program.

The MCS Program Learning Outcomes objectives were reviewed by the MCS faculty and the MCS Advisory Board in November, 2001. No changes were made at that time.

Student Learning Objectives:

Subject Matter: To provide students with

M1: Technical, analytic, problem solving skills required for an initial, entry-level position. Students should be capable of being easily trained in an organization's specific technical environment.

M2: Hands on experience with appropriate technology.

M3: Systems analysis and design skills for continued growth beyond the initial position.

Cognitive Development: To provide students with a/an

C1: Understanding of the business processes of an organization and the ability to fit technology to those processes.

C2: High level of adaptability to new technology and a commitment to continual learning. Students understand the need for innovation, creativity and change.

Skills: To provide students with

S1: Group and individual communication skills - written, oral and presentation using a variety of media.

S2: Professional and personal development skills including a positive attitude toward the work place and work assignments, being goal oriented and a commitment to timeliness, teamwork and quality.

- Describe the data collection techniques used to determine how the program has been successful in achieving the desired performance objectives.

Two quantitative measures of learning outcomes were used in the current audit and review period: surveys of employers of MCS grads and exit surveys of MCS graduates.

Surveys of employers were conducted in 1994, 1996, 1999, and 2003. Unfortunately, responses to the 1999 survey were so low that the data were not usable. Employers were asked to rate their MCS graduate employees from the last 3 years in terms of how well they were prepared on 9 learning dimensions. These dimensions were based on the learning objectives listed above. A five point scale ranging from Very Well Prepared to Very Poorly Prepared was used.

Exit surveys of all graduates are conducted by the Office of Institutional Research at UW-Whitewater. The survey contains 18 questions where students are asked to rate the level of importance and their preparedness on a scale of 1-7 (from very poorly prepared to very well prepared). The survey has been voluntary for undergraduates.

- Summarize the assessment data gathered during the review period. If it is helpful to include data from previous years for comparison purposes, then please do so. (Use tables where necessary).]

Employer Survey

Combining the two positive categories and calculating the percent of respondents who chose one of those categories produces the following results.

Objective	Dimensions	2003 Positive Response %	1996 Positive Response %	1994 Positive response %
M1	Possess the technical, analytic and problem solving skills required for an entry level position with your firm	95%	90%	91%
M1	Had sufficient background to be easily trained in your firm's specific technical environment	95%	86%	97%
M2	Were exposed to the level and type of technology appropriate for your firm	91%	69%	80%
M3	Possess the systems analysis and design skills needed for continued growth beyond their initial position	81%	86%	83%
C1	Understand business processes and can fit technology to those processes	68%	78%	74%
C2	Highly adaptable to new technology, committed to continual learning, innovation and change	90%	88%	91%
S1	Good group communication skills	72%	74%	79%
S1	Good individual communication skills	83%	79%	77%
S2	Bring a professional attitude to the workplace, are goal oriented and committed to timeliness, teamwork and quality	77%	83%	85%
Responses		57	42	35

Exit Surveys

The following table summarizes the results of the exit surveys of MCS Program majors. The survey questions are ranked in order of perceived importance as reported by graduates in Fall 2003. (Note: Spring 2004 numbers were not reported because there were only 5 students in the

sample. The Office of Institutional Research informs us that most of the Spring 2004 graduates took the survey before their last semester due to some confusion about when it should be taken. Starting in Spring 2004, students must be in their last semester when they take the survey so there is a one semester adjustment before the surveys catch up with the right students.)

Importance Fall '03	Survey Question	How Prepared Fall '03	How Prepared Spring '03	How Prepared Fall '02
6.5	18. Ability to use computer technology and apply quantitative methods of analysis.	6.2	6.3	6.5
6.4	7. Able to formulate/implement problem solving strategies/techniques w/changing needs of major	5.6	5.6	6.3
6.2	8. Able to make sound decisions by assessing situations, prioritizing/applying critical reasoning to complex info.	5.4	5.7	5.9
6.1	1. Understand/appreciate basic knowledge of major	5.2	5.4	5.7
6.1	15. Ability to interact with peers in group settings	5.7	5.9	6.1
6	6. Enthusiastically enjoy your major	5.2	5	5.1
6	12. Skills to pursue lifelong learning, professional growth and career progress	5.3	5.6	5.7
6	13. Development of leadership attributes to motivate others and organize effectively	5.0	5.2	5.5
5.9	2. Ability to read/understand professional literature in discipline	5.3	5.4	5.4
5.9	9. Able to research problems by formulating hypotheses, collecting/analyzing info. And drawing appropriate inferences	5.4	5.5	5.6
5.9	17. Writing skills necessary to prepare clear, concise and persuasive reports.	5.3	5.6	5.2
5.8	14. Ability to take initiative/responsibility in unstructured/ambiguous environments	5.1	5.4	5.1
5.8	16. Oral skills necessary to deliver clear, concise and persuasive reports.	5.4	5.6	5.7
5.6	3. Ability to integrate/transfer knowledge from relevant majors	5.3	5.4	5.4
5.6	5. Development of commitment to major	5.4	5.1	5.8
5.4	10. Ability to be creative	4.9	5.2	4.6
5.3	11. Ability to appraise the ethical consequences of decisions	5.2	5.3	5.6
4.4	4. Appreciate effects of international, multicultural and ethnic factors on major	4.8	5	4.5
5.8	Overall average	5.3	5.5	5.5
	Respondents/Total Grads	109/164	46/121	19/39

4. Explain how individual courses are related to the student performance objectives.

The following table indicates coverage of MCS Program objectives by MCS courses as indicated by the faculty who teach the courses. Note that MCS 232, 475, and 391 are alternatives that can be taken as the MCS elective. All of the Subject Matter, Cognitive Development, and Skill objectives are addressed in more than one course. Every MCS course addresses multiple objectives.

	MCS 214	MCS 220	MCS 231	MCS 232	MCS 314	MCS 325	MCS 331	MCS 425	MCS 431	MCS 475	MCS 391
M1	X	X	X	X	X	X	X	X	X	X	X
M2		X	X	X	X	X	X	X	X	X	X
M3	X	X	X		X		X		X		
C1	X	X			X		X		X		X
C2	X	X	X	X	X	X	X	X	X	X	X
S1	X	X	X	X			X		X	X	X
S2	X	X	X	X			X	X	X	X	X

- Discuss potential revisions to the curriculum (e.g., the development of new academic emphases, new courses, etc.) that you foresee over the next review period based on results of assessment of performance objectives.

In the next few years the MCS Program will continue to coordinate and integrate its offerings with other computing programs. In particular, the MCS Program looks forward to using the networking and infrastructure expertise in the IT BE Department to support the needs of its students in those areas.

In response to the relatively low employer scores on learning objective C1 (Understand business processes and can fit technology to those processes – 68% positive) and to concerns that the faculty had about not covering these topics in the curriculum, a new course was designed and implemented (MCS 214 – Information Technology and Practice). As mentioned above (II.B.5), this course also part of the program’s response to the Advisory Board’s suggestion to include more emphasis on database topics.

G.

H. D. List any dual-level courses and indicate how course content, pedagogical processes, assignments, etc., create different educational experiences for graduate and undergraduate students.

(Attach a list linking courses to assessment objectives as Appendix D. Attach a list of any dual-listed courses delineating graduate expectations as Appendix D1.)

No dual level courses are offered.

I. E. Program Improvement Resulting from Assessment Efforts

- Highlight some of the important changes to the curriculum, the assessment objectives, and/or the data collection techniques/processes that have occurred during the review period. Make sure to link the changes to the data collected during the review period.

The curricular changes that resulted from informal assessment from the MCS Advisory Board and formal assessment from the employers are described above (see Sections I.B.5 and I.C.5).

The MCS faculty have determined that they need to increase their collection of assessment data. The changes are to go into effect during the Fall 2004 semester as described in section I.C.

- Indicate how the program has responded to recommendations relevant to assessment of students’ learning from the most recent Audit and Review Evaluation Report.

Two major recommendations were made in the previous Audit and Review Evaluation Report relating to assessment: (1) changes in curriculum should be based, at least in part, on assessment data, and (2) assessments should be shared with students.

As mentioned above (sections I.B.5 and I.C.5), assessment data and informal assessment feedback from the Advisory Board led to changes in the current curriculum.

Assessment results were shared with students at meetings of the student chapter of the Association of Information Processing Professionals (AIP).

J. **F. Information Shared with Constituencies:** Discuss how the assessment information has been shared with important constituencies, including students, staff, advisory boards, etc. In particular, indicate systematic efforts—e.g., regularly scheduled orientation meetings, departmental newsletters, etc.

Formal and informal assessment information has been shared with students through the student chapter of the AITP and with the MCS Advisory Board.

III. Enrollment

A. **Trend Data:** Respond to the following trend data for the program:

1. Number of students enrolled each fall for each of the past five years. (Data provided from the University's fact book.) Note: the MCS and MCS BBA rows are both for the BBA degree. For some reason there was no breakdown in the Fact Book for 2001-2002 by degree program.

	1999-00	2000-01	2001-02	2002-03	2003-04
MANAGEMENT COMPUTER SYSTEMS	385	415	319	292	270
MCS	93	90			
MCS BBA				89	76
MCS NO MIN	196	224			
MCS NO MIN BS				96	86
MCS W MIN	96	101			
MCS W MIN BS				103	105
SCND-MCS BS				1	
SCND-MCS BUS				3	3

2. Number of degrees granted each year for the past five years. (Data provided from the University's fact book.)

	1999	2000	2001	2002	2003
MCS Degree	59	76	82	50	55
MCS BBA	35	40	41	27	24
MCS No Minor	13	20	15	10	12
MCS Minor	11	16	26	13	19

3. Average number of total credits completed by those earning degrees for each year for each of the past five years if the program is an undergraduate major. (Data provided from the University's fact book.) Undergraduate majors with a consistent pattern of students graduating with more than 120 credits should provide an explanation of the program elements that require credit accumulation in excess of that number.

	1999	2000	2001	2002	2003
MCS Degree	131	131	126	132	136
MCS BA	132	129	121	127	129
MCS No Minor	132	134	131	133	133
MCS Minor	124	133	131	142	146

MCS students who earn a BS degree with a minor take more time to graduate than BBA students or BS students with no minor (now changed to a Computer Science minor). The requirements of the minor are delaying their graduation. Many MCS students are choosing to take minors in either the Web program in Mathematics and Computer Science or the End User Computing program in Information Technology and Business Education. These minors are perceived as increasing the opportunities of students in the marketplace. It may also be true that students are

delaying their graduations to take advantage of an improving job market. Further tracking will be necessary to see if the credits to graduation goes down.

To insure that MCS students do not take credits that they don't need for graduation the MCS Program requires that every student sees his or her advisor every semester. This is enforced by a hold on student registrations.

- L. 4. Student placement information. (Data to be provided by the department/program.)

(Attach trend data from the University's Fact Book as Appendix E.) – trend data is provided in sections above.

M.

N. B. Demand for Graduates: Identify career opportunities available for graduates of the program. Placement statistics to be considered may include:

1. Acceptance into graduate programs and employment.

There is no data on graduate program acceptance. Employment rates are as follows:

Academic Year	99/00	00/01	01/02	02/03	03/04
Placement Rate	96%	88%	83%	65%	n/a
Average Starting Salaries	\$42,965.00	\$43,833.00	\$43,618.00	\$40,428.00	n/a

2. Employment projections by the Bureau of Labor Statistics and/or state agencies; and/or

“Fastest growing occupations and occupations projected to have the largest numerical increases in employment between 2002 and 2012, by level of education or training” – Bachelor’s degree (from the Bureau of Labor Statistics -- <http://stats.bls.gov/oco/ocotjt1.htm>)

Fastest Growing Occupations	Occupations having the largest numerical job growth
Network systems and data communications analysts	Elementary school teachers, except special education
Physician assistants	Accountants and auditors
Computer software engineers, applications	Computer systems analysts
Computer software engineers, systems software	Secondary school teachers, except special and vocational education
Database administrators	Computer software engineers, applications

The MCS Program is designed to train application computer software engineers and computer systems analysts. The new database emphasis will prepare some students for database administration.

B. C. Accreditation

1. Identify the role of program accreditation for employment of graduates or program continuation.

The MCS Program is co-sponsored by the College of Business and Economics which is accredited by the AACSB, the major business school accreditation body. The program is part of the accreditation process.

2. If accreditation is not required for graduates’ employment or program continuation, but provides a competitive edge for the program, provide a brief explanation of the advantages of holding this accreditation.

AACSB accreditation is essential for the College of Business and Economics and therefore is important for the continuation of the MCS Program as a cross-disciplinary program with COBE sponsorship.

AACSB accreditation is also important to MCS students who wish to go to graduate school as well as helping to insure the quality of the program and the faculty.

D. D. Location Advantage. Explain any advantages or disadvantages the program has due to the location of the University of Wisconsin-Whitewater and its access to opportunities and resources in the region.

E.

The location of UW-Whitewater, between the two major information technology centers in the state has been beneficial to the MCS Program. Major companies in Milwaukee and Madison have been heavily involved in the MCS Business Partnership Consortium and most of the firms on the MCS Advisory Board come from those two urban centers. Students have found internships and co-op positions available in these areas and many student systems projects have been sponsored by firms in the two cities. Active professional organizations in Madison and Milwaukee have also been an important resource for the program.

The location does limit the number of part-time commuter and summer students who might be interested in obtaining a computing degree from UW-Whitewater.

F. E. Comparative Advantage

1. Identify any unique features that set the program apart from other competing programs in the UW System or other colleges or universities in Wisconsin, and/or elements that contribute to the program having a competitive edge. Factors to discuss may include:

a. The program's content or special emphases;

The MCS Program offers a unique combination of rigorous technical training combined with a focus on solving business problems with information technology. Most competing programs focus on technology (i.e., computer science programs) or business uses of technology (i.e., information systems or information technology programs). The UWW Management Computer Systems program bridges the two disciplines to provide graduates with a unique set of knowledge and skills.

b. Its focus on a specific population;

c. The expertise of the faculty and staff in specific areas;

The MCS Program is able to provide its unique combination of technology and business application because of its cross-disciplinary nature. Computer Science faculty provide its rigorous technical foundation while Information Technology faculty provide the business focus and experience.

d. The availability of practicum or internship experiences; and/or

Most MCS students have some practical computing experience before they graduate. Some take advantage of the MCS Co-op Program which requires students to do full-time systems analysis and design work for a company for a summer and a semester. Other students take advantage of company sponsored internships that are publicized by the MCS Program.

e. The lack of duplication of the program at other institutions in the University of Wisconsin System.

The cross-disciplinary nature of the MCS Program is unique in the UW System and insures that its students have a distinctive educational experience and unique professional opportunities.

G.

H. F. Community Impact

1. Discuss the impact that the program has on the community and/or region. Factors to discuss may include:

- a. The involvement of students and/or faculty in the region;

Students are involved by:

- participating in internships and co-op programs,
- staffing systems analysis and design teams for local private and public organizations as part of their capstone experience,
- inviting local business representatives to Student Chapter AITP meetings,
- participating in MCS Business Partnership Consortium projects,
- doing community service as part of college experience.

Faculty are involved by:

- supervising co-op students,
- supervising systems and analysis design teams for local private and public organizations,
- supervising projects that are part of the MCS Business Partnership Consortium,
- consulting with local organizations.

- b. The utilization of the program by consumers (i.e., performances and/or services); and/or

Services offered include:

- systems analysis and design projects
- MCS Consortium projects
- consulting and training in leading edge topics

- c. Support by regional constituencies.

The MCS Advisory Board consists of representatives of 23 leading Wisconsin firms. These firms represent the most important employers of MCS graduates.

A special constituency are the 6 – 8 firms that support the MCS Business Partnership Consortium.

IV. Resource Availability and Development

Include a table summarizing specific faculty and staff contributions in teaching, research, and service as applicable as Appendix F. (On a chart, Include names, bibliographic information for publications and creative activities, listing of service contributions, etc.)

I. A. Faculty and Staff Characteristics

1. Discuss the characteristics of the faculty and staff responsible for the program. Factors to be discussed include levels of professional preparation; appropriateness of expertise to the needs of the program; unit cohesiveness in enhancing program quality; and success in meeting affirmative action goals.

College of Letters and Sciences: Department of Mathematics and Computer Science (these faculty typically have additional teaching responsibilities in their home department)

- Bob Bryan (PhD) – expertise in programming and databases
- Athula Gunawardena (PhD) – expertise in networking and computer infrastructure
- Jonathan Kane (PhD) - expertise in programming and an award-winning advisor

- Bob Siemann (PhD) – expertise in programming and databases

College of Business and Economics: Department of Information Technology and Business Education (these faculty often have additional teaching responsibilities in their home department as well as teaching in the MCS Masters Degree program and the MBA program)

- Choton Basu (PhD) – expertise in global information systems, e-commerce, IT management, and systems analysis and design
- Bob Horton (PhD) – expertise in IT management and programming; currently also the chair of the IT BE Department
- Bob Leitheiser (PhD) – expertise in databases, systems analysis and design, and IT management; currently also coordinator of the MCS program
- David Munro (PhD) – expertise in web development, programming, systems analysis and design, and IT management
- George Sargent (PhD) – expertise in web development, programming, and IT management; also currently oversees the MCS computer lab

During the audit period, Dr's. Kumar and Iyengar left the faculty.

The ability of the MCS Program to draw on two faculties (L & S and COBE) is one of its core strengths. The programming and networking requirements of the program are met principally by the L & S faculty while the systems analysis and design and IT management needs are fulfilled by the COBE faculty. There is some overlapping expertise (e.g., database and programming) that allows some flexibility in coverage.

The MCS Program faculty meet weekly to discuss issues and make decisions that influence the continuing success of the program. The cohesiveness, collegiality, and professionalism of the faculty listed above is another core strength of the MCS Program.

Two non-Anglo faculty are part of the MCS Program: Dr. Gunawardena and Dr. Basu. Unfortunately, in spite of significant efforts in some recent position searches, there currently are no female faculty affiliated with the MCS Program. Adding female faculty will continue to be a major affirmative action goal.

1. Indicate the courses in the curriculum for which each faculty and staff member is responsible.

MCS Undergraduate Courses

- MCS 214: Information Technology Concepts and Practice (new course: Siemann)
- MCS 220: Concepts of Programming (Bryan, Kane)
- MCS 231: Concepts of Data Structure (Bryan, Kane)
- MCS 232: Concepts of COBOL with File Structures (recently turned into an elective: Siemann, Munro)
- MCS 314: Advanced Database Design and Administration (new course: Leitheiser)
- MCS 325: Web Development 1 (Munro)
- MCS 331: Systems Analysis and Design 1 (Basu, Leitheiser, Munro)
- MCS 391: MCS Cooperative Program (Horton)
- MCS 425: Web Development 2 (Sargent)
- MCS 431: Systems Analysis and Design 2 (Basu, Leitheiser, Munro)
- MCS 475: Network Engineering (Gunawardena)

2. Identify anticipated staffing changes or areas of need, and the projected impact of these changes and needs on the program.

The number of MCS faculty is down two positions since 2001. This has placed a great strain on the remaining faculty to support the award-winning MCS undergraduate program, the MCS graduate program, and the ongoing needs of the home departments. Sections of classes have been cut and others have been enlarged beyond their desired

class sizes. Only the current historically low enrollments in the program have made it possible to meet most of the needs of our students. As enrollments rebound after the temporary shocks of the “dot com bust” and the 9/11 attacks the program will not be able to satisfy student demand. It is imperative that a new tenure-track faculty member be hired in the near future.

The MCS Program will increase its collaboration with computing faculty in the Math and Computer Sciences Department and the Information Technology and Business Education Department.

J. B. Teaching and Learning Enhancement

1. Discuss the characteristics of the faculty and staff activities in the areas of teaching and learning enhancement since the previous audit and review Participation in on-campus and off-campus teaching enhancement activities; involvement in academic advising and efforts to maintain or improve advising performance; work with undergraduate students on research projects; initiatives in student-learning based outcomes; new course development; and/or involvement with interdisciplinary course development and/or delivery.

Academic Advising

Every student who declares MCS as a major must see his/her advisor every semester. Students are assigned to advisors based on what college they are in. Within a college, there is an attempt to distribute advisees equally to MCS faculty. (1999-2004)

MCS Cooperative Program

Every semester an MCS faculty member coordinates the MCS Cooperative Program. This highly respected program places students in area businesses for a semester and a summer. Dr. Horton was the Coop coordinator for the entire audit period. (1999 – 2004)

Student Associations

The student Association for Information Technology Professionals (AITP) continues to be sponsored by the MCS Program. During the audit period, Dr's. Horton, Munro, Kumar, and Basu, have served as faculty advisors. The student chapter has won many honors including the Student Chapter Outstanding Performance Award, for 4 out of the 5 audit years, which is the highest award the parent AITP organization gives to student chapters. (1999-2004)

Dr. Munro served as faculty advisor to the student InterVarsity Christian Fellowship organization (1999-2000).

Dr. Horton served as faculty advisor for an exchange program with the University of Hertfordshire in Hatfield, England. (1999-2004)

Dr. Kumar was nominated by one of his students for recognition by the Blue Key National Honor Society as an instructor that had significantly influenced a student's life. (1999-2000)

Dr. Gunawardena served as Faculty Advisor, NCUR (2002-2003).

Dr. Basu taught and traveled with 26 students to India as part of Study Abroad program (January 2004).

New Courses and Program Development

The MCS faculty continually review the MCS Program and make changes based on Advisory Board input, assessment results, student feedback, and faculty perceptions of trends in the industry and in technology.

During the review period two new MCS courses were developed, one existing course was dropped, and one existing course was changed to an elective. Dr. Kane chairs the MCS Undergraduate Program committee. The two new courses were:

MCS 214: Information Technology Concepts and Practice developed by Dr. Siemann and first taught in Fall 2003.

MCS 314: Advanced Database Design and Administration developed by Dr. Leitheiser and first taught in Spring 2004.

Major changes were made to existing courses to stay current and relevant in the rapidly evolving information technology field.

- a fundamental shift to object-orientated development from structured development approaches which affected most of the courses in the MCS program (implemented 2000-2002),
- a change in the principal programming language from C++ to Java requiring significant changes to MCS 220 and MCS 231 by Dr's. Bryan and Kane (2000-2001),
- major revisions to MCS 325 and MCS 425 to focus on n-tier client server architectures using .NET and Java technology respectively by Dr's. Munro and Sargent,
- the introduction of object-oriented analysis and design methodologies into the capstone course sequence (MCS 331 and MCS 431) along with associated methodologies (i.e., the Unified Modeling Language) and a new software tool (i.e., Rational Rose) by Dr. Leitheiser (implemented 2002-2003).

Dr. Basu taught 4 e-business modules and developed 1 online e-business module for the GBR Center.

Dr. Munro developed and taught 1 online e-business module for the GBR Center.

Student Recruitment

MCS Computers on Campus Day was held during each of the Fall semesters of the audit and review period. High school students and teachers come to campus for a day of presentations, tours and activities designed to communicate opportunities in the computing field and the benefits of attending UW-Whitewater and earning an MCS degree. Dr's. Bryan and Horton have organized the event with assistance from other MCS faculty.

K. C. Research and Other Scholarly/Creative Activities

1. Discuss the characteristics of the faculty and staff related to research and other scholarly/creative activities of the faculty and staff since the previous audit and review. Delineate participation in professional meetings, exhibits, performances, presentations and publications as means of presenting original basic and applied research initiatives. (1999-2004)

Faculty	Presentations	Proceedings	Journal Articles	Book Chapters	Book Reviews	Books/ Software
Basu	17	15	6	3	1	
Gunawardena	2		1			
Horton	1	1	1			
Iyengar			4			
Kane	2		1			SW
Kumar	5		2			Book

Leitheiser	2	2				
Munro	4	3	2			
Sargent	5	3	2			
Siemann						SW

A major challenge for the MCS faculty is to keep up with the constantly changing technologies and methodologies they teach. Unfortunately this does not show up in the above table. These changes are driven less by research than by industry practice. All MCS faculty invest significant amounts of time in learning what industry is currently doing and integrating it into the MCS curriculum.

L. D. External Funding

M.

1. Discuss the characteristics of the faculty and staff related to the efforts and successes of the program to generate funding through grants, contracts and/or gifts. Indicate sources, requested dollar amounts, and current status of such requests.

The following externally funded MCS projects were pursued during:

- MCS Minority Scholarship Program
 - anonymous donor \$5, 250/year (1999-2003)
 - Harley-Davidson Foundation \$5, 250/year (1999-2003)
- Walgreen's for an Information Technology Scholarship \$500/year (1999-2003)
- UTIC Conference Development Grant \$500 (applied but not funded)
- MCS Business Consortium: approximately \$100,000 in money, hardware, software or services (1999-2004)

The MCS Business Partnership Consortium was founded in 1999-2000 and consisted of CNH Global (CASE), Deluxe, Harley-Davidson, IBM, Johnson Wax and Quad/Graphics. This group pledged \$100,000 annually to fund needed hardware/software for the MCS student computer lab, for technical support and for training faculty in new technologies. The Consortium continues to be very active with two new members; American Family Insurance and Aurora Health Care, joining in Spring 2004.

N. E. Professional and Public Service

O.

1. Discuss the characteristics of the faculty and staff related to professional and public service activities of the faculty and staff since the previous audit and review. Discuss such activities as: service involvement in professional organizations at state, regional, national, or international levels; editing or reviewing for professional publications within the discipline; non-compensated consulting or intervention activities related to the discipline; and/or roles and memberships in university, college, and departmental committees

Conference Sponsorship

The 14th annual Midwest Computer Conference was held at UW-Whitewater on March 31, 2000 and attracted 110 participants from 7 states. It featured 3 extremely well received keynote addresses and 6 tracks including 17 papers representing 34 authors, along with 8 panels, tutorials, and presentations. New this year was a special track for business professionals devoted to e-business. Dr. Horton was the conference chair and Dr. Leitheiser was the program chair. All MCS faculty members were involved in various conference committees.

Faculty and staff involvement with professional publications

Dr. Horton - Reviewed Enterprise Resource Planning: What Every Student Should Know for Course Technology Publishers

Dr. Kumar - Board of Editors for the Journal of Global Information Technology Management

Reviewed papers for the Global Information Technology Management Association Conference, Memphis, June, 2000.

Dr. Basu- Board of Editors of the Journal of Global Information Technology Management.

Faculty Involvement in Public and Professional aService

Dr. Horton served on the State of Wisconsin Information Technology Youth Apprenticeship Advisory Committee, 1999-00

Served on the State of Wisconsin IT Governance Task Force, Fall 2000

Served on the Advisory Committee for the National Academy of Information Technology, Washington High School, Milwaukee, 2000-01

Outside reviewer for the Master of Science in Computer and Information Systems degree proposal from UW-Parkside

Dr. Kane - Assistant coach for Wisconsin State MathCounts team and served as a grader at Wisconsin State MathCounts meet (1999, 2000, 2001, 2003)

Served on Advisory Board for the American Mathematics Competitions which trains the US team for the International Mathematics Olympiad (1999-2004)

Helped at annual UW-Whitewater math meet (1999, 2000 and 2003)

Wisconsin Section of the Mathematics Association of America, Chair-Elect April 2001 to April 2002; Chair from April 2002 to April 2003; and Past-Chair from April 2003 to April 2004.

Dr. Leitheiser – member of Society for Information Management (SIM – Wisconsin) Work Force Initiative Committee (1999-2000)

Member of Society for Information Management (SIM – Wisconsin) Web Team (2002-2004)

Faculty Involvement in Professional Organizations and Events

Dr. Horton - Conference Committee for the Midwest Computer Conference, 1999-2004.

Technical Advisory Board for Washington High School, Milwaukee, 1999-2004

Dr. Kumar - Chair, Decision Support Technologies track, Global Information Technology Management Conference, Memphis, June, 2000

Co-chair, Global Information Technology Management and Electronic Commerce track, AIS'99 Conference, Milwaukee, August, 1999

Track Chair for "Decision Support Technologies", Session Chair for "Decision Support Technologies in Global Environment", Global Information Technology Management World Conference, June 11-13, 2000, Memphis

Dr. Iyengar - Track Chair for "Information Technology and Internet" track for 2001 International Academy of Business Disciplines (IABD), Orlando, April 2001

Dr. Kane - Chair-elect, Wisconsin Section of the Mathematical Association of America, 2001.

B. F. Resources for Students in the Program

3. Discuss the number of students in the program in relation to the resources available to the program. Factors which may be analyzed include: the number of students per faculty member; and the amount budgeted to student help, capital, supplies/services, etc.

Currently there are nine faculty members to support the MCS undergraduate program. These faculty also support programs in their home departments. The four L & S faculty typically teach only half time in the program. One of the COBE faculty members (Dr. Horton) is also the chair of the IT BE Department and has a half-time buyout. Another faculty member (Dr. Leitheiser) has a quarter-time buyout to coordinate the MCS program. The remaining COBE faculty support the MCS Masters Program as well as providing computer courses in the MBA program.

The number of sections in the undergraduate MCS program has ranged from 14 to 20 over the audit period. In Spring 2004 the number of sections was 15. Given the other teaching responsibilities of the faculty we were just able to cover these sections. If demand should increase to historically normal levels there will not be enough faculty to cover the extra 4-5 sections.

The supply (\$11, 260) and student help (\$2450) budgets for the MCS Program have been adequate to meet normal needs. There are challenges in keeping up to date with technology for faculty equipment. Without college support and outside corporate support this crucial need could not be met.

B. Facilities, Equipment, and Library Holdings

1. Discuss the adequacy of the facilities, equipment, and library holdings available for the purposes of supporting a high quality program. Identify any deficiencies and describe plans to remedy them.

Library books are adequately funded but journals are not. The technology is changing to online access to journals and proceedings and it is imperative that the library provide access to the major digital libraries (e.g., Association for Computing Machinery and International Institute of Electronic and Electronics Engineers) for the faculty and for students.

The MCS Program lab is an important resource for the MCS Program. It contains up-to-date technology and specialized software that is crucial to our coursework and projects. Maintaining this lab is a major challenge for the MCS Program. In the past it has been able to obtain private corporate and University money to upgrade and enhance this facility. This will continue to be an ongoing challenge.

Appendices

The following appendices must be included as attachments to the self-study:

- Appendix A:** Audit and Review Evaluation Report from Last Review
- Appendix B:** Accreditation Report (if relevant)
- Appendix C:** Program AR(s)
- Appendix D:** List Linking Courses to Learning Objectives
- Appendix D1:** List of Dual-Listed Courses and Graduate Requirements (if any)
- Appendix E:** Trend Data included from the University's Fact Book
- Appendix F:** Table of Faculty and Staff contributions in teaching, research, and service

Appendix E:

Fact Book data included in relevant sections.

Appendix F:

Table of Faculty and Staff contributions in teaching, research, and service
(Did not find template on web site.)

Faculty	Presentations	Proceedings	Journal Articles	Book Chapters	Book Reviews	Books/ Software
Basu	17	15	6	3	1	
Gunawardena	2		1			
Horton	1	1	1			
Iyengar			4			
Kane	2		1			SW
Kumar	5		2			Book
Leitheiser	2	2				
Munro	4	3	2			
Sargent	5	3	2			
Siemann						SW