AY 2009 – 2010
Program Review

Computer Science

Mesa State College

Computer Science Program Review

Covering 2004-2008

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A. Brief History of the Program

In 1974, Mesa State College transitioned from a 2-year to a 4-year school, with a mission to offer non-traditional four-year degrees. Thus was initiated the offering of a 4-year degree in Computer Science; at the time, we were the only institution in the state of Colorado that offered a 4-year degree (as opposed to a graduate degree) in Computer Science. The original degree was offered successfully for several years. In 1980, a baccalaureate degree with an emphasis in computer science replaced the earlier program. Finally, with the change from emphasis areas to majors and minors in 1992, Mesa State College offered a Bachelor's of Science degree in computer science. In the 17 years since its adoption, 192 B. S. in Computer Science degrees have been awarded by Mesa State College.

The computer science degree program has been a very successful program in the past, both from the standpoint of attracting students and the success of the students completing the program. Since the College has offered a similar program for over thirty years, it is reasonable to believe that this program will continue to be successful.

B. Program Goals and Objectives

To quote from the "role and mission" of the College as mandated in House Bill 1187, "Mesa College shall offer liberal arts and sciences programs and a limited number of professional and technical programs..." The computer science major fits within this role. The computer science program serves students wishing to enter the field, especially those from the western slope of Colorado. Many of these students have family or job responsibilities which make it impractical for them to leave the area to go to school. Many of the students in the current computer science program find part time work within the community as programmers or computer operators, enabling them to continue their education. A sizable number of the graduates from the existing program who wished to remain on the western slope have found employment in their field, thus fulfilling a need for themselves as well as for firms in the area. Many of Mesa State College's graduates have also successfully completed graduate programs.

The goals and objectives of this program are:

Goal 1: Provide a strong program in computer science.

Objectives:

a. Help students obtain an understanding of computer hardware, and the relationship between hardware and software.

b. Help students develop proper problem analysis techniques and programming skills.

c. Provide students with strong logical and critical thinking skills.

Goal 2: Prepare students for employment in such fields as software engineering and design, system programming and applications programming.

Objectives:

a. Provide a curriculum that evolves to meet the demands of the industry.

b. Provide students with an internship / real world experience in their field prior to graduation

c. Encourage independent learning skills.

d. Help students develop professional skills needed in the work environment.

Goal 3: Prepare students to enter graduate programs in computer science.

Objectives:

a. Provide a curriculum that meets standards of major graduate programs.

b. Provide opportunities for research projects and develop research skills.

Goal 4: Provide an opportunity for persons in the geographic region to increase their skills and employability.

Objectives:

a. Provide an Associate's degree curriculum that focuses on the demands of industry.

b. Increase the number of people proficient in computer science to address the nationwide need for technical literacy.

C) Analysis of the Need for the Program

The state of Colorado is one of the most technical states in the union, with employment in technology-related fields accounting for more employment than any other baccalaureate degree. Computer science consistently ranks as one of the best paying and fastest growing fields in the nation and in the state of Colorado specifically. These factors create a high demand for students qualified to work in computer science fields.

Graduates from our program are employed throughout the country, either directly in Computer Science fields, as entrepreneurs starting their own businesses, or working in areas that our combination of technical skill and liberal arts education has prepared them for. In fact, many of our students are employed before they graduate.

As a service to the rest of the campus community, we provide liberal arts background courses for the many students that do not intend to work in the IT industry, but understand its ubiquitous nature in the modern world. The Computer Science department offers two general education courses, CSCI 100 Computers In our Society, and CSCI 106 Web Page Design I, with an average of 250 students per year taking these two courses. In addition to general education courses, CS also offers CSCI 110 & 110L Beginning Programming and CSCI 111 Computer Science I, which serve as first programming classes for degree programs in Computer Information Systems, Physics, and Mathematics- Secondary Education. Roughly half of the students enrolled in the CSCI 111 course and almost all of those in the CSCI 110 courses are non-majors, an average of 45 student enrollments per year. Computer Science has also added a new course, CSCI 130 Intro to Engineering Computing, which ran for the first time in Spring, 2009 with 20 students, with an anticipated an enrollment of 40 students in Spring, 2010. All engineering students will be required to take the class, but its scientific applications may make it of interest to other science majors. Almost half of the student enrollments in computer science are a result of these groups of classes, providing a technology literacy/component to other majors on campus and in the community. In addition, the value of the Computer Science program to the community of Grand Junction, and the western slope of Colorado cannot be underestimated. The majority of computer expertise in the area

comes from students majoring in the program and graduates of this program. For example, the Software Engineering course has had teams of students creating solutions such as a Wine Inventory System, a Pizza Delivery Routing system, and a Auto Tutorial Lab. The User Interface class saw students create projects as well, such as the software currently used by students in the Health & Wellness class and a billing system for a local garage. Students from our Internship course work in business throughout the community fostering a close relationship with these businesses and the college. Also, the department is now offering night and online courses in current computer science theory and technology, allowing them to stay abreast of the field.

The number of majors in Computer Science has decreased somewhat over the last years, but has been healthy compared to the 50% reduction cited in a recent ACM article by Rick Rashid from Microsoft ("Image Crisis: Inspiring a New Generation of Computer Scientists", Communications of the ACM, 51 No. 7, July, 2008, pgs 33-34). The number of majors in Fall Semesters over the last five years was listed as 70, 73, 76, 68, and 68 (see Table 2B, Appendix A). While there was a slight decrease in the number of majors over this period, in comparison with nationwide decreases of up to 50%, as noted by Rashid, our program is relatively healthy. This Fall, 2009, the number of first majors is 75, a slight increase and nearly the same as the highest year listed.

Examining graduations over the five years saw numbers of 14, 15, 7, 6, and 9. The two early, larger numbers reflect graduations of the last students from the CS boom in the latter 90's through 2001. The latter numbers are flat, if not slowly growing. The expected number of graduates in 2009 is at least as high as 2008, and probably higher. Since the growth in the Computer Science enrollment in Fall, 2009 was 31.1% higher than Fall, 2008 (while MSC as a whole grew by 16%), indicating the high demand for this major.

D) Narrative Summary of Resources

i) Unique Characteristics of the Program influencing the need for resources

Besides classroom space, a program in Computer Science requires up-to-date computing facilities. For some courses, special software or upgraded hardware may be required. For example,

the Computer Graphics course uses software which requires better video cards and extra disk space, computer networks requires network servers and hardware, and mobile application development require mobile devices.

For students, it is important to have lab spaces where CS can load software for CS students, labs where students can access any software not readily available for home computing, or access machines able to do what is necessary for their classes is critical. Such lab space has been available at MSC for some time, and is improving with the new facilities being built.

In addition, some classes (those exploring robotics) need special lab space with sinks, machining tools, and electronic testing equipment.

ii) Faculty and Staff

Current Faculty of Computer Science

Name	Deg.	Expertise	Position	Year (Start)
Tenured Faculty				
Arun Ektare	PhD	Electrical Eng./ Computer Design	Professor	1986
Warren MacEvoy	PhD	Robotics	Professor	2001
Gary Rader	PhD	Artificial Intelligence	Professor	1995
Lori Payne	PhD	User Interface Design	Professor	1986
Anne Spalding	PhD	Web Design/Graph Theory	Professor	2001
Instructor				
Carol Basti	Ph.D.	Introductory computing	Lecturer	2000
Part-time Faculty				
Karl Castleton	M.S.	Systems Integration/Robotics	Lecturer	2004

Note that Dr. Basti left Mesa State College after working full-time throughout 2004/2005, and half-time in Fall, 2005.

iii) Physical Facilities

From 2004-2008, the space almost exclusively available to CS has been two laboratory classrooms(24 student capacity each), a small computing research lab, and a small, shared storage area where we housed the robotics laboratory. With the remodeling/construction project still ongoing, CS will gain another general use laboratory (30 student capacity), and one of the older labs was remodeled so it holds 30 students. In addition, one of the original labs has been split into a

server room (which will house servers, hubs, and the new super computer) and a smaller classroom meant mostly for CS majors and project work. The robotics lab is now in new, somewhat larger rooms close to the computer science labs. In addition, labs mostly used by Computer Information Systems faculty and students are also available if CS needs more lab space for classes.

iv) Instructional Equipment, including information technology and its use.

Almost all classrooms at MSC are tech classrooms, with overhead projection hooked to the computer. With the recent renovations, most classrooms in the new spaces (including all computer labs) have document readers available with advanced projection systems. Through the college, all Microsoft Office software is available. Through the MSDA (Microsoft Development Alliance), a partnership offered through Microsoft for a fee ($700 per year), all Microsoft development software is available for free to all faculty and students in the computer science department. This alliance provides software for all the foundation courses in computer science.

v) Library

The Tomlinson Library conducted a study and determined that the resources are sufficient. A weakness is that many of the resources are aged (over 10 years), and thus a recommendation that they be updated as budgets allow.

It should be noted that Computer Science is not as dependent on library resources as much as they used to be, nor as much as some fields might be. Much of the information is now readily available online, often for free. Computer science books published in some areas (such as for a specific programming package) are paperbacks and only useful for a couple of years. It often makes no sense to purchase such books as they are soon out-of-date. Using online sources instead is much more cost-effective, and has the advantage of being available sooner and often longer than the paper copies.

We explored obtaining institutional access to online/electronic book repositories, Safari Online in particular, but determined the institutional costs were prohibitive.

vi) Unique Sources of Revenue and Expenditures

Course fees were approved for most Computer Science courses several years ago, but routine collection wasn't in place until 2004. At the time, it was estimated that the fees would help to cover the cost of software and some of the extra hardware needed. In consideration of the students, charges were kept as low as possible ($10 for general education courses, $20 for major courses).

The industry changed in the last years, with many OpenSource and freeware programs available for no cost. Thus, the fees that would cover the basics but not much else have become fees that allow us to do even more. These fees have been used to purchase hardware, software for general and specific benefit to students; some examples are

- A Telsa-based GPU supercomputer for research projects.
- Project supplies for classroom demonstrations, such as networking equipment.
- Supplies for research and demonstration projects, such as supplies for the mobile applications development, including unlocked phones, and development stations.
- Software and hardware support for classrooms, such as VMWare licenses and extra hard drives for the storage of large class project files (virtual machines in particular).

Any money left over is used to pay for lab assistants to staff the labs in afternoons and evenings so that any student taking a computer science course has tutoring/assistance for their problems. In addition, the assistants serve as occasional extra-help for lab days in the larger, general education programming classes. The difference in these classes has been amazing, and students regularly rate this help highly. Besides helping those students, the jobs help employ some of our majors, giving them valuable experience in technical support for non-majors – something they will need to understand in their future careers.

E. Effectiveness

i) Changes since the 2004 Program Review

There have been several changes since the last program review, some of which had a significant impact on the CS enrollments.

a) **Change in CS curriculum** – as outlined in the last program review, the curriculum for Computer Science was updated, as it had not been in over a decade. Significant differences were moving courses such as Software Engineering into the required courses as a capstone course, and adding several new courses to the Computer Science Choice List. Significant changes to the Minor were also done, as the previous minor unintentionally required more coursework than the major through hidden prerequisites.

b) **Regular addition of course fees** – Although the course fees had been approved earlier, they were regularly available starting in 2004. The course fees have allowed the department to find ways to keep current with hardware (such as our purchase of our first supercomputer in Spring, 2009) and software. It has also allowed the department to employ several of our majors as lab assistants/tutors, one way CS thought to improve retention.

b) **Loss of a full-time instructor** – Following the drop in Computer Science enrollments noted in the 2004 Program Review, the department first reduced the full-time instructor to half-time, then eliminated the position. To manage the course load left, fewer upper division courses were taught, some classes were moved to alternate year offerings, and fewer sections of lower division sections were opened.

c) **One faculty member became Department Head** – resulting in a further reduction in offerings, usually one or two sections per semester.

d) **The continued struggles of Computer Science nationwide** has had an effect at Mesa State College. The slump in enrollment in computer science, discussed in the 2004 Computer Science Program Review continued, long after anyone thought it would

although the numbers at MSC have not continued as dramatically as those reported elsewhere.

ii) Results of Alumni Survey

Only eight former Computer Science students returned the Alumni Survey (see Appendix E for detailed results), so results of the survey are not definitive. Given that, important indicating the high demand for this major.information can be gleaned from those students.

It is noteworthy that only two questions resulted in any dissatisfaction: whether the student was satisfied in how well they were taught to "Communicate Orally" and to "Lead Groups". While encouraging, it indicates that it might to worthwhile to assign leaders in some of the groups where we use team projects, and then to discuss ways to handle common leadership problems. Also, ways to encourage students to talk about computer science among colleagues, with faculty, with community members, should be found.

Alumni Satisfaction Survey			
Question	Satisfied/Very Satisfied	Neutral	Dissatisfied/ Very Dissatisfied
Writing Effectively	6	2	0
Using Computers	8	0	0
Quantitative Ability	8	0	0
Integrate Ideas	8	0	0
Communicate Orally	6	1	1
Listen Effectively	6	2	0
Thinking Creatively	7	1	0
Acquire Skills On Own	8	0	0
Lead Groups	4	3	1
Team Member	7	1	0
Healthy Lifestyle	6	2	0
Aware of Social Problems	4	4	0
Appreciate Art	4	4	0
Organize Information	8	0	0
Decision Making Skills	8	0	0

Also of interest are those areas where Computer Science faculty/courses are compared with those of the other courses these students took at Mesa State.

	Perception of Instruction			**Faculty Availability**	
Rating	Within the Major	General Education		Within the Major	General Education
Excellent	5	2		5	2
Above Average	3	4		3	3
Average	0	2		0	3

In both areas – "Perception of Instruction" and in "Faculty Availability", Computer Science scored higher than the students found with the faculty in their general education courses.

Finally, when asked if they would attend Mesa State College (and presumably Computer Science at this institution) again, all agreed they would. Half indicated "Definitely Yes". As to the value of their education, 5 thought it was "Above Average" and 3 thought it "Excellent".

All of the alumna felt that the quality of their educational program when compared with others was "High" or "Very High".

The survey overall spoke very well of the Computer Science department.

iii) Faculty Success Data

Since the last program review, two of our faculty achieved tenure. One faculty member has been promoted to Professor. Finally, one faculty member has been chosen to become the Department Head for Computer Science, Mathematics, and Statistics.

A major achievement of two faculty members occurred when they participated in the DARPA challenge, reaching the finals in DARPA II, and semi-finals in DARPA III. The challenge to create robotic cars for highway and for urban driving made nationwide news, and resulted in a good deal of publicity for Mesa State College.

The Western Slope High Tech Luncheon (WSHTL) is a regional group founded by Mr. Karl Castleton for those interested in the retention and promotion of the high tech industries and programs (including the BS in Computer Science at MSC) in Western Colorado. The group meets several times a year, offering a presentation on the newest technologies and ample opportunity for Mesa State faculty and students to interact with our colleagues in industry.

iv) Student Success Data

The objectives stated in section B are achieved through a carefully designed curriculum and faculty sponsored programs as detailed in Appendix B. The success in achieving program goals has been measured through the department assessment program using a standardized exit examination, and results of exit and alumni surveys.

Currently, the exit exam being used is the "Major Field Achievement Test" by the Educational Testing Service (ETS). This test is currently divided into areas of Programming Fundamentals, Systems (Architecture, Operating Systems, Networking and Database) and Algorithms/Discrete Structures; which are closely aligned with the objectives for the goal of providing a strong program in computer science.

Year (Fall/Spring)	MFAT Mean Score	Overall Percentile	Programming Fundamentals	Systems	Algorithms & Discrete Structures
2008/9	154	65th	65th	65th	75th
2007/8	154	65th	46th	60th	50th
2006/7	151	55th			
2005/4					
2004/5					

Students graduating from the computer science program have historically scored very well on this test. The mean score for Mesa students is consistently ranked above the 50th percentile in comparison with CS programs from schools across the nation, many of whom have much larger programs or are R1 level schools. *Note that institutional ratings for years before 2007/8 are not listed here as the MFAT was changed and institutional percentiles are not available. Individual percentiles for the students can be seen in Appendix E. While not valid, the average of all scores is 152.75, which is above the 50% value for all years.

Employment of our graduates is an important measure of the quality of our program. Of last year's graduates, the CS faculty have monitored what has happened with them in the months since their graduation. Of the seven students who graduated last year, only one has not found employment. Four have found employment at local firms, one at Northrup Grumann, and two have been accepted to graduate school (one at the University of Colorado and the other at Colorado State University). Alumni and Exit surveys are used to measure the goals of preparing students for employment or graduate school. The data are often incomplete, but eight alumni did respond. Of those, five were employed in a computer science field. Two who were not indicated they had either not seriously tried to find a job in computer science or they had accepted a more lucrative position in another field. Only one had tried to find such a job and not been able.

Only one student returning the survey had been to graduate school, but he (all respondents were male) felt he was very well prepared. Through anecdotal data, the faculty are aware of many other students who have attended graduate school, almost all of whom were successful and reported they felt well-prepared as well. Such data, while not statistically valid, is encouraging.

As a general goal of encouraging student academic success, we encourage our students to create and participate in projects that interest them. This has led to numerous student projects and presentations. Here are some examples:

Quantum Computing

Mobile Autonomous Robotics

High-altitude Atmospheric Experiments

Tele-operation of remote devices

Distributed and Parallel Computing

Analysis of crytographically strong random number generation

Mobile Application Developments

We now have three lab spaces dedicated to the support of such projects, emphasizing server configurations, general computation, and embedded system development. Additionally, we encourage the participation of students in academic programming contests; particularly the ACM international contest. This involvement fosters advances in student knowledge, fosters a sense of community locally and within the discipline, and encourages newer students to do the same.

Program success in providing an opportunity for persons in the geographic region to increase their skills and employability in computer science is measured by the satisfaction of students in lower level courses and the accessibility of these courses to the community.

F) Strengths identified by the program review

i) **A strong faculty with extensive academic and practical experience intent on offering cutting edge curriculum.**

Our faculty has significant non-academic experience working in industry or government or both. These perspectives strongly impact the value and kind of education our program delivers. As new technology arises, the faculty offer students and the community the chance to take courses exploring them. For example, a new course in "Mobile Computing" was offered this semester.

ii) **A curriculum which reflects recent developments in the field.**

Our program, through major changes of the degrees or changes in materials of individual courses, is in constant evolution to match the expectations of the discipline. As part of of this program review, computer science curriculum for all colleges in the state offering this degree were examined and compared to our own to identify any recent trends that we might have missed or those that might be coming.

iii) **A balanced program which exposes students to theory and practice in both hardware and software.**

The many requirements of a career in computer science are regularly negotiated in the program. The broad background of our faculty allows us to form a reasonable balance of all these needs.

iv) **A program which encourages interpersonal and communication skills necessary in the field.**

Modern computer science exists as a collaboration, and our graduates are regularly challenged to work in environments as much like the real world as possible. Many students also do internships, or take on short-term jobs in the community in the computer field.

v) **An atmosphere fostering strong student collaboration and networking.**

Such networking has proven to be important to student satisfaction in the program, helping retention rates, as well as helping students to make contacts necessary to obtain employment before and after graduation. Two groups that help foster are the ACM Student Chapter and the WSHTL, where faculty, students and local computer scientists interact in an atmosphere of scholarship and collegiality. The faculty feel strongly that students who collaborate and interact well are students who are retained in the program and become successful in the field after graduation, so we promote that as much as possible.

G) Areas needing strengthening

i) **Recruitment and retention of computer science students** –ongoing efforts must be made to retain the students we have. It should be noted that in the last program review, the retention rate was 41.2%, while it was 46.1% this time. Efforts have evidently improved retention somewhat, but further efforts must be made.

ii) **Developing online courses** – Since MSC offers some online degrees, all general education courses need to be available online as well. A commitment has been made to begin offering the CSCI 100 and CSCI 106 courses in the next year, but other coursework may also be suitable for online delivery.

iii) **Support for faculty research and development** – With the high cost of seminars and conferences which examine cutting edge information in Computer Science, faculty often feel that faculty development funds are inadequate.. The average available to a faculty member is $600, which rarely covers even the conference fee. To circumvent this, we often agree as a group to pool these funds or roll them over in order that some of our faculty can participate in conferences and workshops.

H) Vision

i) Proposals for strengthening the program

a) Make curriculum changes as identified by the Program Review committee. Those include:

1) Combining CSCI 241 Computer Architecture and CSCI 321 Assembly Language into a single course with a lab based component. The Assembly Language course is challanging for many of our majors, yet is not a large part of the field today. Still, the faculty feel the course is important for the goals of our program – a well-rounded individual familiar with both hardware and software. Moving this material as a portion of our computer architecture diminishes the depth of coverage (which is reasonable considering its place in the current field), but still introduces them to concepts they may need for embedded systems designs.

2) Enable the CSCI 310 Advanced Programming course to be taught in 1-3 hour sections, and then offer one or two of these per semester. Many not in computer science ask for language classes to be taught; some not big enough to justify a 3 credit hour course. This will allow the short courses, and also allow courses to be taught in J-term, or in short summer sessions whereas a 3 hour course might not. Also, other departments have asked us to teach such courses (such as Flash for the Graphic Arts/Animation majors) for their students; this change will allow us to do that.

3) All programs (AS, BS, and Minor in CS) will be required or allowed to take CSCI 310 for credit. The committee felt that students need to take language classes instead of trying to incorporate them in courses already filled with material.

4) Changing the CS Minor to include alternates to the CSCI 241 Architecture course, so that those not interested in hardware can obtain a minor. Options added include the new course added for Engineering (CSCI 130) or CSCI 206 Web Page Design II. This change should also encourage the students interested in web programming to get a minor in CS.

5) Change the AS in Computer Science to include the CISB 205 Advanced Business Software, the CSCI 106 and CSCI 206 Web Page Design I and II, or the CSCI 130 Intro to Engineering CS courses. This would allow students in the AS program to take courses which could help them get jobs in the field, making it a more desirable program.

6) Add new courses to the CS choice list to reflect changes in the field. Courses added are popular new courses CSCI 370 Computer Security and CSCI 345 Video Game Programming.

b) Increase the number of courses available online – Besides being able to generate some FTE by offering such courses, general education courses need to be offered online to meet MSC's commitment to the online degree programs. Additionally, online programs are more accessible to professionals currently working in technical fields and wanting to stay abreast of current computing technologies.

c) Provide more mentoring/tutoring to lower-level computer science students – Already in progress, hiring lab assistants/tutors with the course fee money has proven to be successful but must be taken further. The faculty have voted to create a special group of students, called the Mourey Group in honor of a past faculty member/mentor of many of us here now, to aid directly in the classroom and outside for those courses identified as causing students difficulty. A group of three has been selected for this year, and their use is already in place this semester.

ii) Program priorities requiring additional revenues

No additional revenues outside course fees are required in the foreseeable future. Course fees are expected to provide any additional revenue necessary to pay for any software and hardware required in addition to those already available via OpenSource software and freeware, and with the site license provided by the MSDN (Microsoft site license provided for a relatively small cost yearly).

Appendix A

Program Statistics

Table 1A Undergraduate Enrollment by Major Code, Summer Terms 2004 - 2008
Mesa State College

Level	Major Code	Program Name	2004	2005	2006	2007	2008
Baccalaureate							
	3420	Computer Science					
		New Majors	1	1	0	0	0
		Continuing Majors	8	7	4	7	12
	Sub-Total		**9**	**8**	**4**	**7**	**12**
	All Computer Science						
		New Majors	**1**	**1**	**0**	**0**	**0**
		Continuing Majors	**8**	**7**	**4**	**7**	**12**
Grand Total			**9**	**8**	**4**	**7**	**12**

Table 1B Undergraduate Enrollment by Major Code, Fall Terms 2004 - 2008
Mesa State College

Level	Major Code	Program Name	2004	2005	2006	2007	2008
Baccalaureate							
	3420	Computer Science					
		New Majors	20	33	30	18	23
		Continuing Majors	50	40	46	50	45
	Sub-Total		**70**	**73**	**76**	**68**	**68**
	All Computer Science						
		New Majors	**20**	**33**	**30**	**18**	**23**
		Continuing Majors	**50**	**40**	**46**	**50**	**45**
Grand Total			**70**	**73**	**76**	**68**	**68**

Table 1C Undergraduate Enrollment by Major Code, Spring Terms 2005 - 2009
Mesa State College

Level	Major Code	Program Name	2005	2006	2007	2008	2009
Baccalaureate							
	3420	Computer Science					
		New Majors	11	6	10	7	6
		Continuing Majors	54	57	65	58	53
	Sub-Total		**65**	**63**	**75**	**65**	**59**
	All Computer Science						
		New Majors	**11**	**6**	**10**	**7**	**6**
		Continuing Majors	**54**	**57**	**65**	**58**	**53**
Grand Total			**65**	**63**	**75**	**65**	**59**

Table 2A Undergraduate Computer Science Majors, Summer Terms 2004-2008

Mesa State College

Level	Major Code	Program Name	2004	2005	2006	2007	2008
Freshman							
	3420	Computer Science	1	2	0	0	1
	TOTAL		**1**	**2**	**0**	**0**	**1**
Sophomore							
	3420	Computer Science	1	2	1	2	2
	TOTAL		**1**	**2**	**1**	**2**	**2**
Junior							
	3420	Computer Science	0	2	2	2	2
	TOTAL		**0**	**2**	**2**	**2**	**2**
Senior							
	3420	Computer Science	7	2	1	3	7
	TOTAL		**7**	**2**	**1**	**3**	**7**
ALL CLASSES							
	3420	Computer Science	9	8	4	7	12
	TOTAL		**9**	**8**	**4**	**7**	**12**

Table 2B Undergraduate Computer Science Majors, Fall Terms 2004-2008

Mesa State College

Level	Major Code	Program Name	2004	2005	2006	2007	2008
Freshman							
	3420	Computer Science	14	24	22	10	22
	TOTAL		**14**	**24**	**22**	**10**	**22**
Sophomore							
	3420	Computer Science	14	13	22	15	7
	TOTAL		**14**	**13**	**22**	**15**	**7**
Junior							
	3420	Computer Science	8	11	8	19	11
	TOTAL		**8**	**11**	**8**	**19**	**11**
Senior							
	3420	Computer Science	34	25	24	24	28
	TOTAL		**34**	**25**	**24**	**24**	**28**
ALL CLASSES							
	3420	Computer Science	70	73	76	68	68
	TOTAL		**70**	**73**	**76**	**68**	**68**

Table 2C Undergraduate Computer Science Majors, Spring Terms 2005-2009

Mesa State College

Level	Major Code	Program Name	2005	2006	2007	2008	2009
Freshman							
	3420	Computer Science	9	19	15	12	12
	TOTAL		**9**	**19**	**15**	**12**	**12**
Sophomore							
	3420	Computer Science	16	9	21	10	13
	TOTAL		**16**	**9**	**21**	**10**	**13**
Junior							
	3420	Computer Science	7	11	14	16	6
	TOTAL		**7**	**11**	**14**	**16**	**6**
Senior							
	3420	Computer Science	33	24	25	27	28
	TOTAL		**33**	**24**	**25**	**27**	**28**
ALL CLASSES							
	3420	Computer Science	65	63	75	65	59
	TOTAL		**65**	**63**	**75**	**65**	**59**

Table 3 Computer Science Registrations and Credit Hours by Academic Year - AY 2005 - AY2009

	AY 2005		AY 2006		AY 2007		AY 2008		AY 2009		5 Year Change Registrations		5 Year Change Credit Hours	
	Regis.	Cr Hrs	Regis.	Cr Hrs	Regis.	Cr Hrs	Regis.	Cr Hrs	Regis.	Cr Hrs	#	%	#	%
Lower - 100	469	1419	418	1287	401	1242	363	1151	337	1061	-132	-28.14%	-358	-25.23%
Lower - 200	39	117	58	174	43	129	73	219	52	156	13	33.33%	39	33.33%
Upper - 300	98	276	69	199	71	213	76	228	102	306	4	4.08%	30	10.87%
Upper - 400	92	276	44	132	57	171	37	111	48	143	-44	-47.83%	-133	-48.19%
Total Undergraduate	**698**	**2088**	**589**	**1792**	**572**	**1755**	**549**	**1709**	**539**	**1666**	**-159**	**-22.78%**	**-422**	**-23.55%**

Table 4. Degrees Awarded by Major Code, Academic Years 2004 - 2008

Computer Science

Level	Major Code	Program Name	2004	2005	2006	2007	2008
Baccalaureate							
BS	3420	Computer Science	14	15	7	6	9
TOTAL			**14**	**15**	**7**	**6**	**9**

Table 5A. ONE-YEAR RETENTION RATE FOR FIRST-TIME, FULL-TIME STUDENTS 2004 - 2008
Mesa State College

Level	Major Code	Program Name	Retained or Graduated Subsequent Fall		Not Retained Subsequent Fall		Total	
			#	%	#	%	#	%
Baccalaureate								
	3420	Computer Science	35	46.1%	41	53.9%	76	100.0%
TOTAL			**35**	**46.1%**	**41**	**53.9%**	**76**	**100.0%**

Table 5B. Headcount and Average Cumulative Credit Hours to Degree for Computer Science Majors Graduating AY 2004 - 2008

Type of Entry into MSC		Headcount		Average Cumulative
Baccalaureate				
Student Type				
	Began at MSC	30	58.8%	141.8
	Transferred in to MSC	21	41.2%	152.2
Total	**Subtotal**	**51**	**100.0%**	**146.1**

Table 6. Faculty FTE by Tenure Status, 2005-2009
Mesa State College

	Computer Science	2004-2005 FTE		2005-2006 FTE		2006-2007 FTE		2007-2008 FTE		2008-2009 FTE	
		FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Status											
	Tenure	3.00	47.0%	3.00	56.7%	5.00	99.2%	5.00	96.7%	5.00	93.0%
	Tenure-Track	2.00	31.3%	2.00	37.8%	0.00	0.0%	0.00	0.0%	0.00	0.0%
		5.00	**78.4%**	**5.00**	**94.5%**	**5.00**	**99.2%**	**5.00**	**96.7%**	**5.00**	**93.0%**
	FT Instructor	1.00	15.7%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	PT Instructor	0.38	6.0%	0.29	5.5%	0.04	0.8%	0.17	3.3%	0.38	7.0%
All Faculty		**6.38**	**100.0%**	**5.29**	**100.0%**	**5.04**	**100.0%**	**5.17**	**100.0%**	**5.38**	**100.0%**

Table 7/8 B. Aggregate Faculty Workload by Appointment Status And Course Type

Computer Science WORKLOAD 2008 - 09

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 111	Ektare	A	16	4	64						
1 - T/TT	CSCI 241	Ektare	A	11	3	33						
1 - T/TT	CSCI 490	Ektare	A	12	3	36						
1 - T/TT	CSCI 491	Ektare	A	1	2	2						
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 330	Ektare	A	8	3	24						
1 - T/TT	CSCI 370	Ektare	A	14	3	42						
1 - T/TT	CSCI 484	Ektare	A	9	3	27						
1 - T/TT	CSCI 490	Ektare	A	1	3	3	114	30	357	**1.25**	**11.90**	**9.52**
1 - T/TT	CSCI 106	MacEvoy	A	22	3	66						
1 - T/TT	CSCI 196	MacEvoy	A	18	3	54						
1 - T/TT	CSCI 333	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 470	MacEvoy	A	8	3	24						
1 - T/TT	CSCI 395	MacEvoy	A	3	3	9						
1 - T/TT	CSCI 106	MacEvoy	A	21	3	63						
1 - T/TT	CSCI 306	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 321	MacEvoy	A	15	3	45	115	24	345	**1.00**	**11.50**	**11.50**
1 - T/TT	CSCI 112	Payne	A	12	4	48						
1 - T/TT	CSCI 337	Payne	A	17	3	51						
1 - T/TT	CSCI 460	Payne	A	14	3	42						
1 - T/TT	CSCI 111	Payne	A	17	4	68						
1 - T/TT	CSCI 112	Payne	A	6	4	24						
1 - T/TT	CSCI 395	Payne	A	1	3	3	67	21	236	**0.88**	**7.87**	**8.99**
1 - T/TT	CSCI 106	Rader	A	20	3	60						
1 - T/TT	CSCI 106	Rader	A	16	3	48						
1 - T/TT	CSCI 206	Rader	A	15	3	45						
1 - T/TT	CSCI 250	Rader	A	3	3	9						
1 - T/TT	CSCI 106	Rader	A	23	3	69						
1 - T/TT	CSCI 111	Rader	A	13	4	52						
1 - T/TT	CSCI 250	Rader	A	7	3	21	97	22	304	**0.92**	**10.13**	**11.05**

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 100	Spalding	A	20	3	60						
1 - T/TT	CSCI 110	Spalding	A	13	3	39						
1 - T/TT	CSCI 110L	Spalding	A	4	1	4						
1 - T/TT	CSCI 375	Spalding	A	6	3	18						
1 - T/TT	CSCI 106	Spalding	A	19	3	57						
1 - T/TT	CSCI 110	Spalding	A	11	3	33						
1 - T/TT	CSCI 110L	Spalding	A	3	1	3						
1 - T/TT	CSCI 206	Spalding	A	16	3	48						
1 - T/TT	CSCI 445	Spalding	A	3	3	9	95	23	271	**0.96**	**9.03**	**9.43**
1 - T/TT			A									
			A Total	488	120	1513				**5.00**	**50.43**	**10.09**
1 - T/TT			B									
			B Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
1 - T/TT Total				488	120	1513				**5.00**	**50.43**	**10.09**
3 - FT Temp			A	0		0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
3 - FT Temp Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin			A			0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
6 - PT	CSCI 100	Case	A	18	3	54	18	3	54	**0.13**	**1.80**	**14.40**
6 - PT	CSCI 345	Castleton	A	10	3	30						
6 - PT	CSCI 100	Castleton	A	23	3	69	33	6	99	**0.25**	**3.30**	**13.20**
6 - PT			A									
			A Total	51	9	153				**0.38**	**5.10**	**13.60**
6 - PT Total				51	9	153				**0.38**	**5.10**	**13.60**
Grand Total				539	129	1666				**5.38**	**55.53**	**10.33**

Table 7/8 B. Aggregate Faculty Workload by Appointment Status And Course Type

Computer Science WORKLOAD 2007 - 08

Rank	Course	Instructo	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 111	Ektare	A	16	4	64						
1 - T/TT	CSCI 241	Ektare	A	11	3	33						
1 - T/TT	CSCI 490	Ektare	A	12	3	36						
1 - T/TT	CSCI 491	Ektare	A	1	2	2						
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 330	Ektare	A	8	3	24						
1 - T/TT	CSCI 370	Ektare	A	14	3	42						
1 - T/TT	CSCI 484	Ektare	A	9	3	27						
1 - T/TT	CSCI 490	Ektare	A	1	3	3	114	30	357	**1.25**	**11.90**	**9.52**
1 - T/TT	CSCI 106	MacEvoy	A	22	3	66						
1 - T/TT	CSCI 196	MacEvoy	A	18	3	54						
1 - T/TT	CSCI 333	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 470	MacEvoy	A	8	3	24						
1 - T/TT	CSCI 395	MacEvoy	A	3	3	9						
1 - T/TT	CSCI 106	MacEvoy	A	21	3	63						
1 - T/TT	CSCI 306	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 321	MacEvoy	A	15	3	45	115	24	345	**1.00**	**11.50**	**11.50**
1 - T/TT	CSCI 112	Payne	A	12	4	48						
1 - T/TT	CSCI 337	Payne	A	17	3	51						
1 - T/TT	CSCI 460	Payne	A	14	3	42						
1 - T/TT	CSCI 111	Payne	A	17	4	68						
1 - T/TT	CSCI 112	Payne	A	6	4	24						
1 - T/TT	CSCI 395	Payne	A	1	3	3	67	21	236	**0.88**	**7.87**	**8.99**
1 - T/TT	CSCI 106	Rader	A	20	3	60						
1 - T/TT	CSCI 106	Rader	A	16	3	48						
1 - T/TT	CSCI 206	Rader	A	15	3	45						
1 - T/TT	CSCI 250	Rader	A	3	3	9						
1 - T/TT	CSCI 106	Rader	A	23	3	69						
1 - T/TT	CSCI 111	Rader	A	13	4	52						
1 - T/TT	CSCI 250	Rader	A	7	3	21	97	22	304	**0.92**	**10.13**	**11.05**

Rank	Course	Instructo	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 100	Spalding	A	20	3	60						
1 - T/TT	CSCI 110	Spalding	A	13	3	39						
1 - T/TT	CSCI 110L	Spalding	A	4	1	4						
1 - T/TT	CSCI 375	Spalding	A	6	3	18						
1 - T/TT	CSCI 106	Spalding	A	19	3	57						
1 - T/TT	CSCI 110	Spalding	A	11	3	33						
1 - T/TT	CSCI 110L	Spalding	A	3	1	3						
1 - T/TT	CSCI 206	Spalding	A	16	3	48						
1 - T/TT	CSCI 445	Spalding	A	3	3	9	95	23	271	**0.96**	**9.03**	**9.43**
1 - T/TT			A									
			A Total	488	120	1513				**5.00**	**50.43**	**10.09**
1 - T/TT			B									
			B Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
1 - T/TT Total				488	120	1513				**5.00**	**50.43**	**10.09**
3 - FT Temp			A	0		0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
3 - FT Temp Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin			A			0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
6 - PT	CSCI 100	Case	A	18	3	54	18	3	54	**0.13**	**1.80**	**14.40**
6 - PT	CSCI 345	Castleton	A	10	3	30						
6 - PT	CSCI 100	Castleton	A	23	3	69	33	6	99	**0.25**	**3.30**	**13.20**
6 - PT			A									
			A Total	51	9	153				**0.38**	**5.10**	**13.60**
6 - PT Total				51	9	153				**0.38**	**5.10**	**13.60**
Grand Total				539	129	1666				**5.38**	**55.53**	**10.33**

Table 7/8 B. Aggregate Faculty Workload by Appointment Status And Course Type

Computer Science WORKLOAD 2006 - 07

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 111	Ektare	A	16	4	64						
1 - T/TT	CSCI 241	Ektare	A	11	3	33						
1 - T/TT	CSCI 490	Ektare	A	12	3	36						
1 - T/TT	CSCI 491	Ektare	A	1	2	2						
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 330	Ektare	A	8	3	24						
1 - T/TT	CSCI 370	Ektare	A	14	3	42						
1 - T/TT	CSCI 484	Ektare	A	9	3	27						
1 - T/TT	CSCI 490	Ektare	A	1	3	3	114	30	357	**1.25**	**11.90**	**9.52**
1 - T/TT	CSCI 106	MacEvoy	A	22	3	66						
1 - T/TT	CSCI 196	MacEvoy	A	18	3	54						
1 - T/TT	CSCI 333	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 470	MacEvoy	A	8	3	24						
1 - T/TT	CSCI 395	MacEvoy	A	3	3	9						
1 - T/TT	CSCI 106	MacEvoy	A	21	3	63						
1 - T/TT	CSCI 306	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 321	MacEvoy	A	15	3	45	115	24	345	**1.00**	**11.50**	**11.50**
1 - T/TT	CSCI 112	Payne	A	12	4	48						
1 - T/TT	CSCI 337	Payne	A	17	3	51						
1 - T/TT	CSCI 460	Payne	A	14	3	42						
1 - T/TT	CSCI 111	Payne	A	17	4	68						
1 - T/TT	CSCI 112	Payne	A	6	4	24						
1 - T/TT	CSCI 395	Payne	A	1	3	3	67	21	236	**0.88**	**7.87**	**8.99**
1 - T/TT	CSCI 106	Rader	A	20	3	60						
1 - T/TT	CSCI 106	Rader	A	16	3	48						
1 - T/TT	CSCI 206	Rader	A	15	3	45						
1 - T/TT	CSCI 250	Rader	A	3	3	9						
1 - T/TT	CSCI 106	Rader	A	23	3	69						
1 - T/TT	CSCI 111	Rader	A	13	4	52						
1 - T/TT	CSCI 250	Rader	A	7	3	21	97	22	304	**0.92**	**10.13**	**11.05**

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 100	Spalding	A	20	3	60						
1 - T/TT	CSCI 110	Spalding	A	13	3	39						
1 - T/TT	CSCI 110L	Spalding	A	4	1	4						
1 - T/TT	CSCI 375	Spalding	A	6	3	18						
1 - T/TT	CSCI 106	Spalding	A	19	3	57						
1 - T/TT	CSCI 110	Spalding	A	11	3	33						
1 - T/TT	CSCI 110L	Spalding	A	3	1	3						
1 - T/TT	CSCI 206	Spalding	A	16	3	48						
1 - T/TT	CSCI 445	Spalding	A	3	3	9	95	23	271	**0.96**	**9.03**	**9.43**
1 - T/TT			A									
			A Tota	488	120	1513				**5.00**	**50.43**	**10.09**
1 - T/TT			B									
			B Tota	0	0	0				**0.00**	**0.00**	**#DIV/0!**
1 - T/TT Total				488	120	1513				**5.00**	**50.43**	**10.09**
3 - FT Temp			A	0		0						
			A Tota	0	0	0				**0.00**	**0.00**	**#DIV/0!**
3 - FT Temp Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin			A			0						
			A Tota	0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
6 - PT	CSCI 100	Case	A	18	3	54	18	3	54	**0.13**	**1.80**	**14.40**
6 - PT	CSCI 345	Castleton	A	10	3	30						
6 - PT	CSCI 100	Castleton	A	23	3	69	33	6	99	**0.25**	**3.30**	**13.20**
6 - PT			A									
			A Tota	51	9	153				**0.38**	**5.10**	**13.60**
6 - PT Total				51	9	153				**0.38**	**5.10**	**13.60**
Grand Total				539	129	1666				**5.38**	**55.53**	**10.33**

Table 7/8 B. Aggregate Faculty Workload by Appointment Status And Course Type

Computer Science WORKLOAD 2005 - 06

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 111	Ektare	A	16	4	64						
1 - T/TT	CSCI 241	Ektare	A	11	3	33						
1 - T/TT	CSCI 490	Ektare	A	12	3	36						
1 - T/TT	CSCI 491	Ektare	A	1	2	2						
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 330	Ektare	A	8	3	24						
1 - T/TT	CSCI 370	Ektare	A	14	3	42						
1 - T/TT	CSCI 484	Ektare	A	9	3	27						
1 - T/TT	CSCI 490	Ektare	A	1	3	3	114	30	357	**1.25**	**11.90**	**9.52**
1 - T/TT	CSCI 106	MacEvoy	A	22	3	66						
1 - T/TT	CSCI 196	MacEvoy	A	18	3	54						
1 - T/TT	CSCI 333	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 470	MacEvoy	A	8	3	24						
1 - T/TT	CSCI 395	MacEvoy	A	3	3	9						
1 - T/TT	CSCI 106	MacEvoy	A	21	3	63						
1 - T/TT	CSCI 306	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 321	MacEvoy	A	15	3	45	115	24	345	**1.00**	**11.50**	**11.50**
1 - T/TT	CSCI 112	Payne	A	12	4	48						
1 - T/TT	CSCI 337	Payne	A	17	3	51						
1 - T/TT	CSCI 460	Payne	A	14	3	42						
1 - T/TT	CSCI 111	Payne	A	17	4	68						
1 - T/TT	CSCI 112	Payne	A	6	4	24						
1 - T/TT	CSCI 395	Payne	A	1	3	3	67	21	236	**0.88**	**7.87**	**8.99**
1 - T/TT	CSCI 106	Rader	A	20	3	60						
1 - T/TT	CSCI 106	Rader	A	16	3	48						
1 - T/TT	CSCI 206	Rader	A	15	3	45						
1 - T/TT	CSCI 250	Rader	A	3	3	9						
1 - T/TT	CSCI 106	Rader	A	23	3	69						
1 - T/TT	CSCI 111	Rader	A	13	4	52						
1 - T/TT	CSCI 250	Rader	A	7	3	21	97	22	304	**0.92**	**10.13**	**11.05**

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 100	Spalding	A	20	3	60						
1 - T/TT	CSCI 110	Spalding	A	13	3	39						
1 - T/TT	CSCI 110L	Spalding	A	4	1	4						
1 - T/TT	CSCI 375	Spalding	A	6	3	18						
1 - T/TT	CSCI 106	Spalding	A	19	3	57						
1 - T/TT	CSCI 110	Spalding	A	11	3	33						
1 - T/TT	CSCI 110L	Spalding	A	3	1	3						
1 - T/TT	CSCI 206	Spalding	A	16	3	48						
1 - T/TT	CSCI 445	Spalding	A	3	3	9	95	23	271	**0.96**	**9.03**	**9.43**
1 - T/TT			A									
			A Total	488	120	1513				**5.00**	**50.43**	**10.09**
1 - T/TT			B									
			B Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
1 - T/TT Total				488	120	1513				**5.00**	**50.43**	**10.09**
3 - FT Temp			A	0		0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
3 - FT Temp Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin			A			0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
6 - PT	CSCI 100	Case	A	18	3	54	18	3	54	**0.13**	**1.80**	**14.40**
6 - PT	CSCI 345	Castleton	A	10	3	30						
6 - PT	CSCI 100	Castleton	A	23	3	69	33	6	99	**0.25**	**3.30**	**13.20**
6 - PT			A									
			A Total	51	9	153				**0.38**	**5.10**	**13.60**
6 - PT Total				51	9	153				**0.38**	**5.10**	**13.60**
Grand Total				539	129	1666				**5.38**	**55.53**	**10.33**

Table 7/8 B. Aggregate Faculty Workload by Appointment Status And Course Type

Computer Science WORKLOAD 2004 - 05

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 111	Ektare	A	16	4	64						
1 - T/TT	CSCI 241	Ektare	A	11	3	33						
1 - T/TT	CSCI 490	Ektare	A	12	3	36						
1 - T/TT	CSCI 491	Ektare	A	1	2	2						
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 330	Ektare	A	8	3	24						
1 - T/TT	CSCI 370	Ektare	A	14	3	42						
1 - T/TT	CSCI 484	Ektare	A	9	3	27						
1 - T/TT	CSCI 490	Ektare	A	1	3	3	114	30	357	**1.25**	**11.90**	**9.52**
1 - T/TT	CSCI 106	MacEvoy	A	22	3	66						
1 - T/TT	CSCI 196	MacEvoy	A	18	3	54						
1 - T/TT	CSCI 333	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 470	MacEvoy	A	8	3	24						
1 - T/TT	CSCI 395	MacEvoy	A	3	3	9						
1 - T/TT	CSCI 106	MacEvoy	A	21	3	63						
1 - T/TT	CSCI 306	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 321	MacEvoy	A	15	3	45	115	24	345	**1.00**	**11.50**	**11.50**
1 - T/TT	CSCI 112	Payne	A	12	4	48						
1 - T/TT	CSCI 337	Payne	A	17	3	51						
1 - T/TT	CSCI 460	Payne	A	14	3	42						
1 - T/TT	CSCI 111	Payne	A	17	4	68						
1 - T/TT	CSCI 112	Payne	A	6	4	24						
1 - T/TT	CSCI 395	Payne	A	1	3	3	67	21	236	**0.88**	**7.87**	**8.99**
1 - T/TT	CSCI 106	Rader	A	20	3	60						
1 - T/TT	CSCI 106	Rader	A	16	3	48						
1 - T/TT	CSCI 206	Rader	A	15	3	45						
1 - T/TT	CSCI 250	Rader	A	3	3	9						
1 - T/TT	CSCI 106	Rader	A	23	3	69						
1 - T/TT	CSCI 111	Rader	A	13	4	52						
1 - T/TT	CSCI 250	Rader	A	7	3	21	97	22	304	**0.92**	**10.13**	**11.05**

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 100	Spalding	A	20	3	60						
1 - T/TT	CSCI 110	Spalding	A	13	3	39						
1 - T/TT	CSCI 110L	Spalding	A	4	1	4						
1 - T/TT	CSCI 375	Spalding	A	6	3	18						
1 - T/TT	CSCI 106	Spalding	A	19	3	57						
1 - T/TT	CSCI 110	Spalding	A	11	3	33						
1 - T/TT	CSCI 110L	Spalding	A	3	1	3						
1 - T/TT	CSCI 206	Spalding	A	16	3	48						
1 - T/TT	CSCI 445	Spalding	A	3	3	9	95	23	271	**0.96**	**9.03**	**9.43**
1 - T/TT			A									
			A Total	488	120	1513				**5.00**	**50.43**	**10.09**
1 - T/TT			B									
			B Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
1 - T/TT Total				488	120	1513				**5.00**	**50.43**	**10.09**
3 - FT Temp			A	0		0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
3 - FT Temp Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin			A			0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
6 - PT	CSCI 100	Case	A	18	3	54	18	3	54	**0.13**	**1.80**	**14.40**
6 - PT	CSCI 345	Castleton	A	10	3	30						
6 - PT	CSCI 100	Castleton	A	23	3	69	33	6	99	**0.25**	**3.30**	**13.20**
6 - PT			A									
			A Total	51	9	153				**0.38**	**5.10**	**13.60**
6 - PT Total				51	9	153				**0.38**	**5.10**	**13.60**
Grand Total				539	129	1666				**5.38**	**55.53**	**10.33**

Table 7/8. Faculty Workload By Appointment Status And Course Type

Computer Science Workload 2008 - 09

Rank	Track	Enrollments	Course CH	Student CH	FTEF	FTES	FTES/FTEF
1 -Tenured/Tenure Track							
	A Total	488	120	1513	5.00	50.43	10.09
	B Total				0.00	0.00	N/A
		488	120	1,513	5.00	50.43	10.09
3 - FT Temp							
	A Total	0	0	0	0.00	0.00	N/A
	B Total	0	0	0	0.00	0.00	N/A
		0	0	0	0.00	0.00	N/A
5 - Administrative							
	A Total	0	0	0	0.00	0.00	N/A
	B Total	0	0	0	0.00	0.00	N/A
		0	0	0	0.00	0.00	N/A
6 - PT							
	A Total	51	9	153	0.38	5.10	13.60
	B Total	0	0	0	0.00	0.00	N/A
		51	9	153	0.38	5.10	13.60
Grand Total		**539**	**129**	**1,666**	**5.38**	**55.53**	**10.33**

Table 7/8 B. Aggregate Faculty Workload by Appointment Status And Course Type

Computer Science WORKLOAD 2007 - 08

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 111	Ektare	A	16	4	64						
1 - T/TT	CSCI 241	Ektare	A	11	3	33						
1 - T/TT	CSCI 490	Ektare	A	12	3	36						
1 - T/TT	CSCI 491	Ektare	A	1	2	2						
1 - T/TT	CSCI 106	Ektare	A	21	3	63						
1 - T/TT	CSCI 330	Ektare	A	8	3	24						
1 - T/TT	CSCI 370	Ektare	A	14	3	42						
1 - T/TT	CSCI 484	Ektare	A	9	3	27						
1 - T/TT	CSCI 490	Ektare	A	1	3	3	114	30	357	**1.25**	**11.90**	**9.52**
1 - T/TT	CSCI 106	MacEvoy	A	22	3	66						
1 - T/TT	CSCI 196	MacEvoy	A	18	3	54						
1 - T/TT	CSCI 333	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 470	MacEvoy	A	8	3	24						
1 - T/TT	CSCI 395	MacEvoy	A	3	3	9						
1 - T/TT	CSCI 106	MacEvoy	A	21	3	63						
1 - T/TT	CSCI 306	MacEvoy	A	14	3	42						
1 - T/TT	CSCI 321	MacEvoy	A	15	3	45	115	24	345	**1.00**	**11.50**	**11.50**
1 - T/TT	CSCI 112	Payne	A	12	4	48						
1 - T/TT	CSCI 337	Payne	A	17	3	51						
1 - T/TT	CSCI 460	Payne	A	14	3	42						
1 - T/TT	CSCI 111	Payne	A	17	4	68						
1 - T/TT	CSCI 112	Payne	A	6	4	24						
1 - T/TT	CSCI 395	Payne	A	1	3	3	67	21	236	**0.88**	**7.87**	**8.99**
1 - T/TT	CSCI 106	Rader	A	20	3	60						
1 - T/TT	CSCI 106	Rader	A	16	3	48						
1 - T/TT	CSCI 206	Rader	A	15	3	45						
1 - T/TT	CSCI 250	Rader	A	3	3	9						
1 - T/TT	CSCI 106	Rader	A	23	3	69						
1 - T/TT	CSCI 111	Rader	A	13	4	52						
1 - T/TT	CSCI 250	Rader	A	7	3	21	97	22	304	**0.92**	**10.13**	**11.05**

Rank	Course	Instructor	Track	Enrollments	Course CH	Student CH				FTEF	FTES	FTES/FTEF
1 - T/TT	CSCI 100	Spalding	A	20	3	60						
1 - T/TT	CSCI 110	Spalding	A	13	3	39						
1 - T/TT	CSCI 110L	Spalding	A	4	1	4						
1 - T/TT	CSCI 375	Spalding	A	6	3	18						
1 - T/TT	CSCI 106	Spalding	A	19	3	57						
1 - T/TT	CSCI 110	Spalding	A	11	3	33						
1 - T/TT	CSCI 110L	Spalding	A	3	1	3						
1 - T/TT	CSCI 206	Spalding	A	16	3	48						
1 - T/TT	CSCI 445	Spalding	A	3	3	9	95	23	271	**0.96**	**9.03**	**9.43**
1 - T/TT			A									
			A Total	488	120	1513				**5.00**	**50.43**	**10.09**
1 - T/TT			B									
			B Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
1 - T/TT Total				488	120	1513				**5.00**	**50.43**	**10.09**
3 - FT Temp			A	0		0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
3 - FT Temp Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin			A			0						
			A Total	0	0	0				**0.00**	**0.00**	**#DIV/0!**
5 - Admin Total				0	0	0				**0.00**	**0.00**	**#DIV/0!**
6 - PT	CSCI 100	Case	A	18	3	54	18	3	54	**0.13**	**1.80**	**14.40**
6 - PT	CSCI 345	Castleton	A	10	3	30						
6 - PT	CSCI 100	Castleton	A	23	3	69	33	6	99	**0.25**	**3.30**	**13.20**
6 - PT			A									
			A Total	51	9	153				**0.38**	**5.10**	**13.60**
6 - PT Total				51	9	153				**0.38**	**5.10**	**13.60**
Grand Total				539	129	1666				**5.38**	**55.53**	**10.33**

Table 9 COURSE COUNT BY COURSE LEVEL AY 2009

Level/Course Level	Summer Courses		Fall Courses		Spring Courses		Total Courses	
Undergraduate								
Remedial - 000	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Lower - 100	0	0.0%	10	50.0%	11	47.8%	21	48.8%
Lower - 200	0	0.0%	2	10.0%	3	13.0%	5	11.6%
Upper - 300	0	0.0%	5	25.0%	5	21.7%	10	23.3%
Upper - 400	0	0.0%	3	15.0%	4	17.4%	7	16.3%
Subtotal Undergraduates	**0**	0.0%	**20**	**100.0%**	**23**	**100.0%**	**43**	**100.0%**
Graduate								
Graduate - 500	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Subtotal Graduates	**0**	0.0%	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Total	**0**	**0.0%**	**20**	**100.0%**	**23**	**100.0%**	**43**	**100.0%**

Appendix B

Finance and Budget

Table 10a. 5 Year Budget Data for 1460 - Computer Science

Expenditures	Banner Acct #	2005-2006 $	2005-2006 FTE	2006-2007 $	2006-2007 FTE	2007-2008 $	2007-2008 FTE	2008-2009 $	2008-2009 FTE	2009-2010 $	2009-2010 FTE
Classified Salaries - Reg FT	5006										
Classified Salaries - Reg Pt	5026										
Retirement Classified Staff	5166										
Worker's Compensation Insurance	5196										
Tuition Reimbursement (Other Benefits	5246										
Insurance Classified Staff	5216										
Contractual - Reg FT	5256	270,330	5.00	275,675	5.00	289,885	5.00	300,371	5.00	327,139	5.00
Contractual - Summer Faculty	5266										
Contractual - Reg PT	5276										
Contractual - Temp FT	5286	30,899	1.00	31,511	1.00	33,717	1.00				
Contractual - Temp PT	5296										
Contractual - Overload	5366									1,320	
Retirement Contractual	5466	33,211		33,854		36,286		35,019		39,785	
Insurance Contractual	5516	36,240		38,985		30,799		30,971		37,251	
Worker's Compensation Insurance	5496										
Unemployment	5486										
Wellness (Other Benefits)	5476										
Tuition Reimbursement	5546										
Student Worker's Compensation Ins.	5556										
Federal Workstudy Match	5606										
Student Assistants	5706	500		515		515		515		515	
Professional Fees	6100										
Employee Travel - In State	6150	2,950		3,000		3,000		3,000		3,000	
Student Travel - In State	6155										
Faculty Supervisory Travel - In State	6151										
Emplloyee Travel - Out of State	6160										

Table 10a. 5 Year Budget Data for 1460 - Computer Science

Expenditures	Banner Acct #	2005-2006 $	2005-2006 FTE	2006-2007 $	2006-2007 FTE	2007-2008 $	2007-2008 FTE	2008-2009 $	2008-2009 FTE	2009-2010 $	2009-2010 FTE
Student Travel - Out of State	6165										
Software Maintenance	6196										
Supplies	6201	2,300		2,300		2,300		2,300		2,300	
Lights & Gels	6205										
Software Maintenance	6211										
Printing Off Campus	6230										
Telecommunications	6255										
Subscriptions & Books	6310										
Telephone Calls	6401	168		168		168		168		168	
Telephone Equipment	6410	3,648		4,232		4,232		4,232		4,232	
Postage	6430	72		72		72		72		72	
Dues & Membership	6470										
Advertising	6480										
Equipment Repair & Maint.	6501										
Maintenance Supplies	6550										
Rent/Lease Equipment	6760	1,210		1,210		1,210		1,210		1,210	
Official Functions	6850										
Other Costs	6980										
Professional Development	7150										
Capital Equipment	8090										
Equipment	8100										
Computer Equipment	8101										
Budgeted Change - Rollover	8885			5,885		11,964		15,463		19,817	
Transfer PC replacement	8950	50									
Restricted Reserve - Course specific fee	8980										
Total Expenditures		381,579	6.00	397,407	6.00	414,148	6.00	393,321	5.00	436,809	5.00

Table 10a. 5 Year Budget Data for 1460 - Computer Science

Expenditures	Banner Acct #	2005-2006 $	2005-2006 FTE	2006-2007 $	2006-2007 FTE	2007-2008 $	2007-2008 FTE	2008-2009 $	2008-2009 FTE	2009-2010 $	2009-2010 FTE
Total Classified Salaries		0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Classified Benefits		0		0		0		0		0	
Total Exempt Regular Salaries		270,330	5.00	275,675	5.00	289,885	5.00	300,371	5.00	327,139	5.00
Total Exempt Temporary Salaries		30,899	1.00	31,511	1.00	33,717	1.00	0	0.00	0	0.00
Total Exempt Benefits		69,451		72,839		67,085		65,990		77,036	
Total Hourly		500		515		515		515		515	
Total Travel		2,950		3,000		3,000		3,000		3,000	
Total OCE		3,632		9,467		15,546		19,045		23,399	
Total Internal Charges		3,816		4,400		4,400		4,400		4,400	
Total Utilities											
Total Learning Materials											
Total Transfers											
Total Capital.											
Grand Total		381,579	6.00	397,407	6.00	414,148	6.00	393,321	5.00	435,489	5.00

Table 10b. 5 Year Budget Data for 1461 - Computer Science Course Fees

Revenues	Banner Acct #	2005-2006 $	2005-2006 FTE	2006-2007 $	2006-2007 FTE	2007-2008 $	2007-2008 FTE	2008-2009 $	2008-2009 FTE	2009-2010 $	2009-2010 FTE
Course Specific Fees - NS	4030					11,265		10,775		11,228	
Student Fees	4300					1,471					
Total Revenues		0	0	0	0	12,736	0	10,775	0	11,228	0

Expenditures	Banner Acct #	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Student Assistants	5706							3,000		2,500	
Supplies	6201					11,228		11,228		9,228	
Lights & Gels	6205										
Software Maintenance	6211										
Printing Off Campus	6230										
Telecommunications	6255										
Subscriptions & Books	6310										
Telephone Calls	6401										
Telephone Equipment	6410										
Equipment	8100										
Computer Equipment	8101					1,508					
Budgeted Change - Rollover	8885					20,323		21,221		24,199	
Transfer PC replacement	8950										
Restricted Reserve - Course specific fee	8980										
Total Expenditures		0	0.00	0	0.00	33,059	0.00	35,449	0.00	35,927	0.00

Table 10b. 5 Year Budget Data for 1461 - Computer Science Course Fees

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Total OCE	0	0	33,059	35,449	35,927
Total Internal Charges	0	0	0	0	0
Grand Total	0 0.00	0 0.00	33,059 0.00	35,449 0.00	35,927 0.00

*Note that there were no data before 2007 because course fees were kept in same account as department budget

**Note that Revenue = Expenditures minus the rollover money from prior year. Money was being saved for purchases made when new facilities are built/remodeled.

Appendix C

Library Assessment

Library Program Assessment
John U. Tomlinson Library
Mesa State College

Date of Assessment: August 18, 2009

Purpose of Assessment: Analysis of Library Resources

Program under review: Computer Science

Program Level/s: B. S., A. S., and a minor

Liaison Signature: Assessment done by Paul Rolland

1. Collection Assessment

This program has approximately 100 majors at any given time with an average of 8-12 students graduating with the Bachelors degree each year. Library resources for this program include materials on the subjects of computer science, computer programming and languages, operating systems, computer architecture, data structures, embedded systems, UNIX, web site design, user interfaces, video game design, computer security, object oriented programming, computer graphics, compiler structure, database design, computer networks, algorithms, artificial intelligence, and software engineering.

a. Reference Support

The Library has an adequate number of Reference print titles in the Computer Science field, however it is a very old collection. In the subjects listed above, there are 43 titles on the Reference shelves, but only 4 are 10 years old or newer.

b. Monographic Sources

The circulating collection has adequate coverage for the Computer Science program. In the general subject area of computer science, there are 210 circulating books with 64 being 10 years old or less and there are 141 government publications with 61 being 10 years old or less. Statistics for more specific subjects within the field are as follows: computer programming and languages has 241 circulating books with 35 being 10 years old or less, operating systems has 60 circulating books with 22 being 10 years old or less, computer networks has 179 circulating books with 63 being 10 years old or less, computer security has 70 circulating books with 47 being 10 years old or less, web site design has 15 circulating books with all being 10 years old or less, and artificial intelligence has 121 circulating books with 21 being 10 years old or less. Prospector is available to all faculty, staff, and students for 2-5 day delivery of 20+ million items from major Colorado and Wyoming libraries.

c. Periodicals

The Library has 18 print periodicals on various Computer Science subjects, 6 are open subscriptions and 12 are closed or discontinued. Of the closed titles, many have online availability. Access to online periodical articles in the field is substantial. Library users can find over 227 online periodicals through the Library's Journal Finder as well as substantial coverage in several of the Library's online databases for Computer Science subjects (see d. below).

d. Electronic Resources

The Library's electronic resources provide good coverage for Computer Science subjects. Current subscriptions to Ebsco's Academic Search Premier and H.W. Wilson's OmniFile Select are maintained. These products contain ample current information on the main subject areas of this program as well as substantial full-text citations. Other online databases the Library licenses that pertain to Computer Science subjects include: Business Source Premier, Lexis-Nexis, OmniFile Select, Oxford Reference Online, Science Direct, and Scitopia. All Library databases are available to students 24/7 from any Internet computer. The Library also has 21 academically-oriented videos available in this field.

2. Evaluation of the total collection

a. Strengths

The Library has good electronic resources in this field, especially for an institution of this size and type. There is an annual budget of at least $1500 available to Department faculty to purchase books, videos, etc. for the Library's collection.

b. Weaknesses

Books in the Computer Science collection have a very high percentage of titles older than 10 years.

3. Recommendations

The Library currently has sufficient resources in the subjects relevant to this degree program and Library support should be maintained at its current level. Updating of the collection with new materials is a priority and should continue via current budget allocations and faculty recommendations.

Library Director: Elizabeth W. Brodak Date: 8/20/09

Appendix D

Most Recent Program Review Summary

Summary of 2004 Computer Science Program Review

The 2004 Computer Science Program Review identified the following strengths:

1) **Strong Faculty with extensive academic and practical experience**

2) **A curriculum which reflects recent developments in the field**

3) **A balanced program which exposes students to theory and practice in both hardware and software**

In addition, several weaknesses in the program were noted and recommendations made. A review of these and the resulting department response follows:

1) **A barrier of low-level programming (C/C++) and mathematics (Calculus II) to succeed in the degree.**

Partly in response to changes in the way MSC treated degree distinction but also for our program, Calculus II was moved to the major requirements section rather than in the General Education category, where no grade lower than a C can be used. Now, a grade of D in Calculus II will not stop a student from completing the degree, since one "D" can be used in the major. There have been several students positively affected by this change.

Second, lab assistants have been employed using student course fee money to staff labs in the afternoon and evening hours. These assistants are trained in the languages and have taken the courses for which the students need help. The results so far have been positive, but more work is being done to improve the staffing.

2) **No dedicated lab for classes to successfully fun the latest development tools for regular classes.**

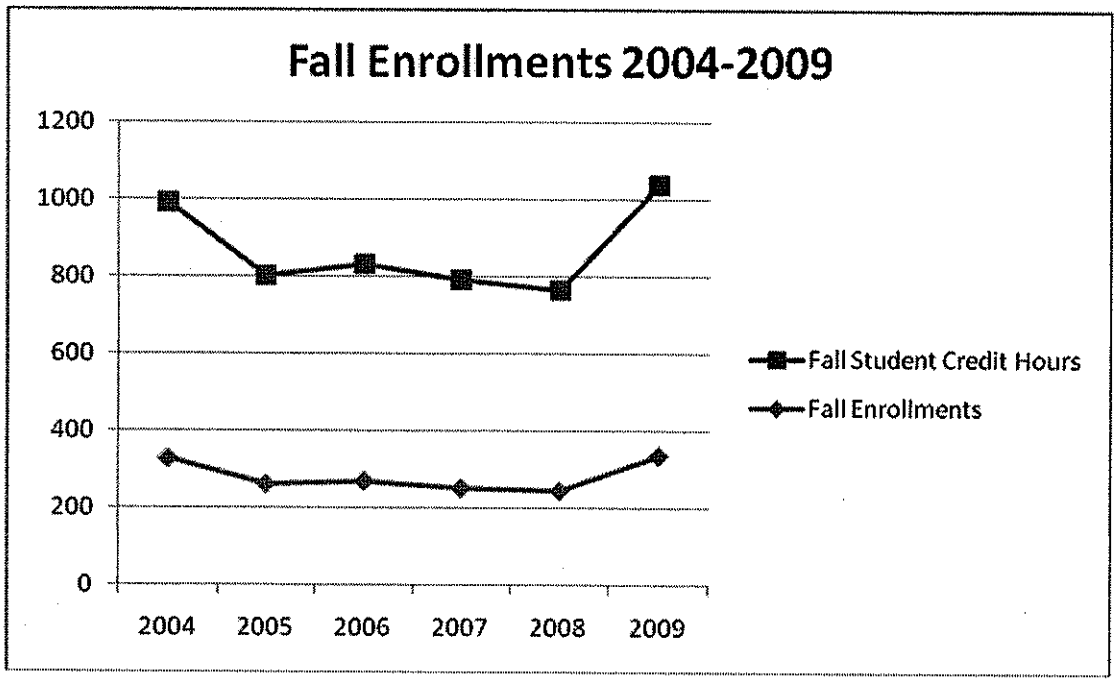
This was a weakness for the entire five years of the program review, but new facilities have come on line this year and more another classroom will be available next year. One of the labs is a "majors lab" and is attached to a server lab, where much of the software and hardware can be used for some of the tools mentioned above.

Another interesting development has taken place. Since the prior study was completed, the amount of software available as freeware and open source software has greatly improved the department's ability to

explore new software and hardware without disruption to others in the lab and without costing a lot of money.

3) **The decline in enrollment in the computer science major.**

At the time, the decline in computer science enrollment was just beginning, but there was no way of knowing it then. It came after a huge boom in the latter 1990's, an increase that was nationwide and reflected at MSC as well. The bust was driven mostly due to the reputation of the Dot Com failure, but was later exacerbated by the 2001 economic recession. Computer science remains one of the top fields in terms of job opportunities and salaries, so the continued slump has puzzled everyone.



Finally, however, in the last several months, the trends have started to reverse. While the first declines at MSC trailed those of the nation by about a year, it was not clear if MSC would show increases in enrollment right away. However, Fall enrollments in computer science courses are up 30% from Fall 2008. The number of majors is up too, as the table shows. MSC as a whole is up, but whereas the college as a whole is up by 15.1%, Computer Science enrollments are up by 31.1%. A comparable field, CIS (Computer Information Systems) is down 8.4%, and mathematics is up 20.1%. It appears the change to computer science is real, and that CS is finally starting to recover, but only time will tell for certain.

Appendix E

Assessment Plan and Results

Computer Science Assessment Results 2006/9

Intended Student Outcome	Means Of Assessment	Results	Use Of Results
Graduates will demonstrate an understanding of computer hardware	MFAT test will be given and the mean percentile in computer hardware categories will be at or above the 33 percentile	No data was collected on this item. We had three graduates and none of them took the MFAT exam	We will redesign the assessment measures to match the change in the MFAT. The scores meet our expectations.
	Alumni Survey/ Pre-Graduation Survey will be given to graduates. On a scale of 1 (very good) to 5 (very poor), at least 75% will respond with a 2 or above to questions about hardware skills for their employment in CS fields or for their graduate studies in CS.	In 2008, a general alumni survey was given in 2008 but the questions specific to Hardware Skills for employment were not included. The departmental alumni survey will be given during 2009 to add to the general survey and additional questions will be added to this survey to better assess this objective	We are still pursing the best way to survey our graduates.
Graduates will demonstrate an understanding of computer software.	MFAT test will be given and the mean percentile in computer software categories will be at or above the 33 percentile	The MFAT categories have been restructured. The category closest to this measure is Programming. MFAT data for 2008 on a cohort of 9 students reported a mean of 66% in this area which corresponds to the 75 percentile.	The department is very pleased with these results.
	Alumni Survey/ Pre-Graduation Survey will be given to graduates. On a scale of 1 (very good) to 5 (very poor), at least 75% will respond with a 2 or above to questions about their software skills for their employment in CS fields or for their graduate studies in CS.	In 2008, a general alumni survey was given in 2008 but the questions specific to Software Skills for employment were not included. However, on questions about classes of most use, many of our software related courses were listed. The departmental alumni survey will be given during 2009 to add to the general survey and additional questions will be added to this survey to better assess this objective	

Computer Science Assessment Results 2006/9

Intended Student Outcome	Means Of Assessment	Results	Use Of Results
Graduates will demonstrate a mastery of the skills necessary for employment or graduate studies in such fields as software engineering, systems, and applications programming	Alumni Survey/ Pre-Graduation Survey will be used to track graduates and measure the number who are employed and their satisfaction with skills gained in the program. 75% of graduates who are not in graduate school will be employed in their field within two years of graduation and will respond with a 2 or above on a scale of 1(very well) to 5 (very poor) to questions about preparedness for employment.	The general alumni survey from 2008 5 of the 8 respondents were currently employed in CS related fields and 1 found a more desirable position in another field. Of the 5 employed graduates, 4 listed a salary in the %55,000-75,000 range. The department is looking into additional means of tracking students after graduation to maintain accurate records of employment.	
	Graduation Survey will be used to track graduates and measure the number who are attending graduate school and their satisfaction with skills gained in the program. 75% of graduates who are not in graduate school will be employed in their field within two years of graduation and will respond with a 2 or above on a scale of 1(very well) to 5 (very poor) to questions about preparedness for graduate school.	The general alumni survey from 2008 1 of the 8 respondents was currently pursuing a graduate degree and indicated that they were very well prepared for graduate school. 4 of the remaining 7 graduates in 2008 indicated that they were somewhat or highly likely to attend graduate school in the future.	

MFAT Scores 2004-2008

Term Taken	Score	Percentile
Spring 2004	180	95
Fall 2007	172	85
Spring 2004	166	80
Spring 2004	164	75
Fall 2005	164	75
Spring 2008	162	75
Spring 2009	162	75
Spring 2007	160	70
Spring 2004	159	70
Spring 2004	159	70
Spring 2008	156	60
Fall 2005	154	60
Spring 2009	154	60
Spring 2009	154	60
Spring 2006	152	55
Fall 2006	152	55
Spring 2007	152	55
Spring 2009	152	55
Fall 2007	151	55
Spring 2007	149	50
Spring 2008	149	50
Spring 2009	149	50
Spring 2004	148	45
Spring 2008	148	45
Spring 2004	143	35
Spring 2004	141	30
Spring 2007	141	30
Spring 2004	139	25
Spring 2004	139	25
Spring 2006	139	25
Spring 2004	125	5
Average	**152.7419**	
Median Percentile		**55%**

***Note that scores were not available for all students**

****Note that term indicates term of graduation, not reporting term. After change to online MFAT, Director of Testing only submits group of certain size. Smaller groups may not be submitted until the following term/year.**

MFAT Data For Computer Science at MSC

	Institution		Category %: Programming		Discrete Structures/Algorithms		Systems: Architecture/Operating Systems/Networking/ Database	
Year	Mean	Percentile	% Correct	Percentile	% Correct	Percentile	% Correct	Percentile
2004	**							
2005	**							
2006	151 *							
2007	154	65	64	65	38	60	51	75
2008	154	65	66	75	39	65	45	50

*Note - Group percentiles were not available for 2004-2006.

**Data before 2007 pertains to different sub-categories than the tests in 2007/2008, and are therefore not included here.

Mesa State College
Alumni Survey

Thank you for taking a few moments of your time to fill out this survey. Mesa State College is administering this survey to try to help the individual departments determine how to improve their programs and better serve current and future students. The survey should take 5-10 minutes to complete.

How satisfied are you with your education at MSC in the following areas:

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Writing effectively	○	○	○	○	○
Using computers	○	○	○	○	○
Quantitative abilities (e.g. statistics, mathematical reasoning)	○	○	○	○	○
Synthesize and integrate ideas and information	○	○	○	○	○
Communicating well orally	○	○	○	○	○
Listening effectively	○	○	○	○	○
Thinking creatively	○	○	○	○	○
Acquiring new skills and knowledge on my own	○	○	○	○	○
Leading and supervising groups of people	○	○	○	○	○
Functioning effectively as a member of a team	○	○	○	○	○
Maintaining a healthy lifestyle	○	○	○	○	○
Developing awareness of social problems	○	○	○	○	○
Appreciating the arts	○	○	○	○	○
Organizing information	○	○	○	○	○
Decision making skills	○	○	○	○	○

Mesa State College
Alumni Survey

How would you rate the following aspects of your experience at MSC?

	Poor	Below Average	Average	Above Average	Excellent
General education instruction	○	○	○	○	○
Instruction within major	○	○	○	○	○
Availability of faculty in general education courses	○	○	○	○	○
Availability of faculty in major courses	○	○	○	○	○
Course availability	○	○	○	○	○
Academic advising	○	○	○	○	○
Digital environment	○	○	○	○	○
Library facilities	○	○	○	○	○

	Definitely No	No	Unsure	Yes	Definitely Yes
If you could do it over again would you attend Mesa State College?	○	○	○	○	○

	Poor	Below Average	Average	Above Average	Exceptional
Considering the cost of education, the time and effort put forth, and the amount you learned, how good of a value was your education at Mesa State?	○	○	○	○	○

Mesa State College
Alumni Survey

What is your gender?

- O Male
- O Female

What is your ethnicity?

- O American Indian or Alaskan Native
- O Asian
- O Black or African American
- O Hispanic of any race
- O Native Hawaiian or Pacific Islander
- O White
- O Two or more races
- O Race and Ethnicity Unknown
- O Non-Resident alien (of any race or ethnicity)
- O Prefer not to respond

What is your current age?

- O Under 21
- O 21-24
- O 25-34
- O 35-44
- O 45-54
- O 55 or Older
- O Prefer not to respond

Do you live in the state of Colorado?

- O Yes
- O No

Mesa State College
Alumni Survey

	Yes	No
Do you live in the Grand Junction area? (i.e. Mesa, Montrose, Delta or Garfield County)	○	○

Mesa State College
Alumni Survey

In what year did you graduate from Mesa State? (Choose the most recent year if more than one year applies.)

- ○ 2003
- ○ 2004
- ○ 2005
- ○ 2006
- ○ 2007
- ○ 2008

In what term did you graduate?

- ○ Summer
- ○ Fall
- ○ Spring

What was your primary major?
-If you double majored, only choose one program.

- ○ Accounting
- ○ Art
- ○ Computer Science
- ○ English
- ○ Graphic Design
- ○ History
- ○ Mass Communications
- ○ Music
- ○ Theatre

Mesa State College
Alumni Survey

	Very Low	Low	Average	High	Very High
How would you rate the overall quality of your education within your degree program at Mesa State?	○	○	○	○	○

	Yes	No
Are you currently employed in a field related to your major?	○	○

Mesa State College
Alumni Survey

What is the title of your position? _____

What is the name of the company/organization for which you are employed or are you self-employed? _____

How well do you think MSC prepared you for your position when you compare yourself to others in your field of work?

- O I was very well prepared
- O I was generally well prepared
- O I was slightly unprepared
- O I was inadequately prepared

What is your annual full-time income?

- O None
- O Under $25,000
- O $25,000 - $34,999
- O $35,000 - $44,999
- O $45,000 - $54,999
- O $55,000 - $74,999
- O $75,000 or more
- O Prefer not to respond

Why are you not currently employed in a field related to your major?

- O I found a more desirable position in another field.
- O I have not been able to find a position related to my major.
- O I have not seriously looked for a position related to my major.
- O I am attending graduate school.

Other: (Please Specify) _____

Mesa State College
Alumni Survey

	Yes	No
Have you enrolled in a graduate degree program since graduating from MSC?	○	○

Mesa State College
Alumni Survey

What level of degree program is/was it?

Master's	Doctoral	Law	Other
○	○	○	○

What are/were you studying? _____

What is the name of the College/University where you attend(ed)? _____

Did you complete this program?

Yes	No	In the process of finishing
○	○	○

How well do you think MSC prepared you for this degree program when you compare yourself to others in the program?

- ○ I was very well prepared
- ○ I was generally well prepared
- ○ I was slightly unprepared
- ○ I was inadequately prepared

What courses would have better prepared you for this program? _____

Mesa State College
Alumni Survey

What is the likelihood that you will pursue a graduate degree in the next 5 years?

- ○ Highly likely
- ○ Somewhat likely
- ○ Unsure
- ○ Somewhat unlikely
- ○ Highly unlikely

If you decide to pursue a graduate degree, at what level would it be?	Master's	Doctoral	Law	Other
	○	○	○	○

If you decide to pursue a graduate degree, what would you study? _____

Mesa State College
Alumni Survey

What classes within the major have been of most use to you?

_____

_____

What classes within the major have been of little use to you?

_____

_____

If you could add a class to the major requirements, what class would it be?

_____

_____

What suggestions do you have for improving this major at Mesa State?

_____

_____

_____

_____

If you could do it over again would you enroll in the same major program?	Definitely No	No	Unsure	Yes	Definitely Yes
	○	○	○	○	○

Additional reminders will be sent out asking for your response to this survey. If you do not want to receive this reminder please enter the e-mail address that we contacted you at below so we can remove you from the list.

_____

If you would like any information (current mailing or e-mail address) passed on to an academic department or the Alumni Association so they can keep in touch with you, please enter the information below and specify where you would like it to go.

_____

_____

_____

_____

_____

Thank You!

Computer Science General - Frequencies

Writing_Effectively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	25.0	25.0	25.0
	Satisfied	5	62.5	62.5	87.5
	Very Satisfied	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Using_Computers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	3	37.5	37.5	37.5
	Very Satisfied	5	62.5	62.5	100.0
	Total	8	100.0	100.0	

Quantitative_Ability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	3	37.5	37.5	37.5
	Very Satisfied	5	62.5	62.5	100.0
	Total	8	100.0	100.0	

Integrate_Ideas

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	5	62.5	62.5	62.5
	Very Satisfied	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Communicate_Orally

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dissatisfied	1	12.5	12.5	12.5
	Neutral	1	12.5	12.5	25.0
	Satisfied	4	50.0	50.0	75.0
	Very Satisfied	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Listen_Effectively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	25.0	25.0	25.0
	Satisfied	6	75.0	75.0	100.0
	Total	8	100.0	100.0	

Thinking_Creative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	1	12.5	12.5	12.5
	Satisfied	3	37.5	37.5	50.0
	Very Satisfied	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Acquire_Skills_On_Own

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	2	25.0	25.0	25.0
	Very Satisfied	6	75.0	75.0	100.0
	Total	8	100.0	100.0	

Lead_Groups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dissatisfied	1	12.5	12.5	12.5
	Neutral	3	37.5	37.5	50.0
	Satisfied	2	25.0	25.0	75.0
	Very Satisfied	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Team_Member

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	1	12.5	12.5	12.5
	Satisfied	3	37.5	37.5	50.0
	Very Satisfied	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Healthy_Lifestyle

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	25.0	25.0	25.0
	Satisfied	4	50.0	50.0	75.0
	Very Satisfied	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Aware_Social_Problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	4	50.0	50.0	50.0
	Satisfied	2	25.0	25.0	75.0
	Very Satisfied	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Appreciate_Art

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	4	50.0	50.0	50.0
	Satisfied	2	25.0	25.0	75.0
	Very Satisfied	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Organize_Info

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	7	87.5	87.5	87.5
	Very Satisfied	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Decision_Making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfied	6	75.0	75.0	75.0
	Very Satisfied	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Gen_Ed_Instruction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	2	25.0	25.0	25.0
	Above Average	4	50.0	50.0	75.0
	Excellent	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Instruction_Within_Major

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above Average	3	37.5	37.5	37.5
	Excellent	5	62.5	62.5	100.0
	Total	8	100.0	100.0	

Faculty_Availability_Gen_Ed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	3	37.5	37.5	37.5
	Above Average	3	37.5	37.5	75.0
	Excellent	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Faculty_Availability_Major

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above Average	3	37.5	37.5	37.5
	Excellent	5	62.5	62.5	100.0
	Total	8	100.0	100.0	

Course_Availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	1	12.5	12.5	12.5
	Above Average	5	62.5	62.5	75.0
	Excellent	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Academic_Advising

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	3	37.5	37.5	37.5
	Above Average	2	25.0	25.0	62.5
	Excellent	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Digital_Environment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	4	50.0	50.0	50.0
	Above Average	2	25.0	25.0	75.0
	Excellent	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Library_Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	1	12.5	12.5	12.5
	Above Average	3	37.5	37.5	50.0
	Excellent	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Attend_Again

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	50.0	50.0	50.0
	Definitely Yes	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Value_of_education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above Average	5	62.5	62.5	62.5
	Excellent	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Computer Science Demographics - Frequencies

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	8	100.0	100.0	100.0

Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	7	87.5	87.5	87.5
	Prefer not to respond	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-34	6	75.0	75.0	75.0
	35-44	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Live_In_State

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	100.0	100.0	100.0

Live_In_Area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	75.0	75.0	75.0
	No	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Grad_Year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2003	1	12.5	12.5	12.5
	2004	1	12.5	12.5	25.0
	2005	3	37.5	37.5	62.5
	2006	1	12.5	12.5	75.0
	2007	1	12.5	12.5	87.5
	2008	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Grad_Term

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Summer	1	12.5	12.5	12.5
	Fall	4	50.0	50.0	62.5
	Spring	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Computer Science Specific - Frequencies

Education_Quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High	7	87.5	87.5	87.5
	Very High	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Employed_Related_Field

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	62.5	62.5	62.5
	No	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Job_Title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	37.5	37.5	37.5
	GIS Technician II	1	12.5	12.5	50.0
	Programmer Integrator	1	12.5	12.5	62.5
	Software Engineer	2	25.0	25.0	87.5
	Sr Software Engineer	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Employer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	37.5	37.5	37.5
	Ametek VIS	1	12.5	12.5	50.0
	City of Grand Junction	1	12.5	12.5	62.5
	Epsilon Data Management	1	12.5	12.5	75.0
	Flow Data, Inc.	1	12.5	12.5	87.5
	Sun Microsystems	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Prepared_for_Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I was very well prepared	2	25.0	40.0	40.0
	I was generally well prepared	3	37.5	60.0	100.0
	Total	5	62.5	100.0	
Missing	System	3	37.5		
Total		8	100.0		

Annual_Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	$45,000 - $54,999	1	12.5	20.0	20.0
	$55,000 - $74,999	4	50.0	80.0	100.0
	Total	5	62.5	100.0	
Missing	System	3	37.5		
Total		8	100.0		

Why_Not_Employed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I found a more desirable position in another field	1	12.5	33.3	33.3
	I have not been able to find a postion related to my major	1	12.5	33.3	66.7
	I have not seriously looked for a position related to my major	1	12.5	33.3	100.0
	Total	3	37.5	100.0	
Missing	System	5	62.5		
Total		8	100.0		

Why_Not_Employed_Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	in the first few years after school I was unable to find a position in my field, so I looked around at other fields and found construction management was more accessible.	7	87.5	87.5	87.5
		1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Attend_Grad_School

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	12.5	12.5	12.5
	No	7	87.5	87.5	100.0
	Total	8	100.0	100.0	

Grad_Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Masters	1	12.5	100.0	100.0
Missing	System	7	87.5		
Total		8	100.0		

Grad_Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	87.5	87.5	87.5
	Business	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Grad_School

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	87.5	87.5	87.5
	Mesa State College	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Grad_Complete

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	12.5	100.0	100.0
Missing	System	7	87.5		
Total		8	100.0		

Grad_Prepared

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I was very well prepared	1	12.5	100.0	100.0
Missing	System	7	87.5		
Total		8	100.0		

Courses_for_Grad_Program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	87.5	87.5	87.5
	Unknown	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Classes of Most Use

- All of them in one way or another.
- Numerical Analysis, Statistics, Embedded Systems, Computer Database
- Data structures / Algorithms
- UNIX, Software Engineering, C/C++, Java, Computer Architecture, Assembly Language (Embedded Systems), Embedded Systems, Database Design.
- CSCI 111 & 112, Software Engineering, Database Design
- Computer Graphics and Design
- Software Engineering, Computer Science I and II, and Assembly Language Programming
- Embedded Systems, Theory of Computation, Assembly Language

Classes of Little Use

- N/a
- Artificial Intellegence, Theroy of Algorithms
- Assembly
- None.
- Computer Graphics, Computer Architecture, Operating Systems Design
- none
- Database Management, Artification Intelligence
- Networking

Classes to Add to Major requirements

- N/a
- N/A
- Web Design II or III
- A class that would focus only on designing software for a certain solution. Propose students with a problem and have them come up with a software solution. Such as picking an appropriate language, databases, software processes (waterfall, iteration..), abstracting the components (objects) that will play major roles in the software, user interfaces, test cases, IDEs to be used for development, documentation. Then the second semester or part II of the course, they can implement their design.
- VBA for Windows- call it Practical Application Programming for business
- Software Requirements and Testing Process
- Applied Engineering Mathematics

Suggestions

- Nothing I had a great experience in obtaining my education.
- Make available classes that don't necessarily teach a lot of the same topics over again for a majority of the class length. (e.g Data Structures, Theory of Algorithms, Discrete Structures)
- Bigger and better computer science labs.
- More Software Engineering classes including design
- Unknown
- I think it is great. Working on more large project design and organization.
- First, keep it! Second, hire Karl Castleton - I learned about as much from him as from the rest of the faculty combined, except for maybe Dr. Macevoy. I have been involved in this field for a long time, and the education that Mesa State provides in Computer Science is good. It needs a little more of an engineering emphasis than it does. Both Mr. Castleton and Dr. Macevoy have strong applied engineering experience, which is invaluable in today's market, and is very desirable here in the Grand Valley. This is an essential program for Mesa State.

Chance_of_Grad_School

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly likely	3	37.5	42.9	42.9
	Somewhat likely	1	12.5	14.3	57.1
	Unsure	1	12.5	14.3	71.4
	Somewhat unlikely	1	12.5	14.3	85.7
	Highly unlikely	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Level_of_Grad_School

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Masters	6	75.0	100.0	100.0
Missing	System	2	25.0		
Total		8	100.0		

Grad_School_Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	25.0	25.0	25.0
	Business Administration	2	25.0	25.0	50.0
	Computer Science	2	25.0	25.0	75.0
	Criminal Justice/Criminology	1	12.5	12.5	87.5
	Unsure	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Enroll_Same_Major

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unsure	1	12.5	12.5	12.5
	Yes	3	37.5	37.5	50.0
	Definitely Yes	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Appendix F

Faculty Vitae

KARL J. CASTLETON
Research Scientist III
Pacific Northwest National Laboratory
Environmental Technology Directorate
1100 North Ave
Math, Computer Science, and Statistics
Mesa State College
Grand Junction, Colorado 81501
970-248-1837(W), 970-248-1324(FAX), karl.castleton@pnl.gov(E:Mail)

Education

MS Computer Science, Washington State University, 1997
BS Computer Science and Mathematics, Mesa State College, 1992, Cum Laude
AAS Electronics, Mesa State College, 1987, with distinction

Expertise

Mr. Castleton facilitates integration of models and data sets to facility decision making on environmental issues. The most flexible of the tools he uses is the Framework for Risk Analysis for Multimedia Environmental Systems. (FRAMES). This tool greatly facilitates the task of understanding the semantics of a modeling exercise and capturing that knowledge in a clear data structure that allows the models to be integrated in a straight forward manner. Some other software systems that have been integrated by Mr. Castleton include Onsite Automated Risk Computation System (OARCS), the Multimedia Pollutant Assessment System (MEPAS) and Multimedia Integrated Modeling System (MIMS). A team including Mr. Castleton at the EPA's ORD-NERL-ERD designed MIMS. This design was intended to further the ability of modelers to integrate models in more complex ways.

Mr. Castleton also builds tools that facilitate parallel processing of independent simulations to answer sensitivity and uncertainty questions in these complex multi-media modeling systems. The FRAMES Multi-media, Multi-pathway, Multi-receptor Risk Assessment (FRAMES-3MRA) was a specific modeling system to inform a specific rule that EPA would like to promulgate. Its intent was to simulate the effect of letting different concentration levels be treated at waste facilities at industrial sites, instead of hazardous waste facilities. Once the required models have been integrated the question of what are the sensitive parameters or how much variability or uncertainty is associated with the result needs to be answered. Mr. Castleton has developed a general set of tools that facilitate answering these questions with a collection of integrated models.

Mr. Castleton also integrates software and hardware systems together to make Autonomous Vehicles. This includes small robots that include only passive electronic components to large Autonomous Vehicles that have competed in the last two DARPA Challenges National Qualifying Events. The purpose of these explorations into autonomous vehicles is to understand what level of complexity of the device is needed to support a wanted behavior. Mr. Castleton has recently developed a software hardware system that allows a small robot to locate itself within $1/10^{th}$ of an inch using a collection of components that are affordable and abundant.

Experience

Mr. Castleton was instrumental in the development of the FRAMES software system. His work recently has focused on a demonstration of how a generalized assessment strategy approach can be implemented within FRAMES. This capability would allow assessments similar to Hazardous Waste Identification Rule (HWIR) to be conducted without construction of custom software. The HWIR preliminary results were based on 94,000 multimedia simulations of 17 different environmental models. Mr. Castleton is currently involved with HWIR at the conclusion of the Science Advisory Board (SAB), review of the software system and approach. Part of his preparation has been in writing visualization tools, written in Java, that allow the users to understand the environmental relationships preserved in the HWIR model. A version of HWIR that executes on a cluster of PC's running Microsoft Windows was prototyped on a cluster of 100 PC's. These programs were written for MS-Windows platforms in C++ and Java. Mr. Castleton designed and implemented computation of the risk to offsite populations for the Hanford Remedial Action (HRA) EIS. This required coordinating 8 million modeling runs, and summarizing the results. This approach included a loosely coupled parallel processing by networked PC's. Mr. Castleton has also designed and implemented computation approaches for calculating the risk to the offsite populations surrounding the 14 major DOE

installations. To compute these results, a balanced approach of designing for existing code and new code was used.

Selected Publications

Castleton K.J, and P.D. Meyer. 2009. FRAMES-2.0 Software System: Frames 2.0 Pest Integration (F2PEST) . PNNL-18395, Pacific Northwest National Laboratory, Richland, WA.

Gelston G.M., K.J. Castleton, B.L. Browne, R.L. Baddeley, K.S. Rohlfing, and J.G. April. 2009. "Techno-Social DSS for Container Inspection Operations and Critical Event Response." In Systemics, Cybernetics and Informatics: WMSCI 2009. PNNL-SA-65156, Pacific Northwest National Laboratory, Richland, WA.

Babendreier J.E., and K.J. Castleton. 2005. "Investigating Uncertainty and Sensitivity in Integrated, Multimedia Environmental Models: Tools for FRAMES-3MRA." Environmental Modelling & Software, with Environmental Data 20(8):1043-1055.

Shah A., K.J. Castleton, and B.L. Hoopes. 2004. "Framework for Risk Analysis in Multimedia Environmental Systems: Modeling Individual Steps of a Risk Assessment Process." In Proceedings of the International Conference on Modeling, Simulation and Visualization Methods, MSV'04 and Proceedings of the International Conference on Algorithmic Mathematics and Computer Science AMCS'04 June 21-24 2004, Las Vegas, NV, pp. 38-44. CSREA Press, Bogart, GA.

Fine, S. S., S. C. Howard, A. M. Eyth, D. A. Herington, K. J. Castleton, 2002, "The EPA Multimedia Integrated Modeling System Software Suite", Second Federal Interagency Hydrologic Modeling Conference, July 28-August 1, Las Vegas, Nevada. 2002

J.E. Babendreier and K.J. Castleton "Investigating Uncertainty and Sensitivity in Integrated, Multimedia Environmental Models: Tools for 3MRA" iEMSs Proceedings, Volume 2, 2002 pg 90

Hoopes, B. L., and K. J. Castleton. 1998. "Concepts Associated with a Framework for Risk Analysis in Multimedia Environmental Systems." In Proceedings, American Nuclear Society Conference, April 5-8, 1998, Pasco, Washington.

Henderson, J. C., A. Nazarelli, and K. J. Castleton. 1998. "Screening Analysis to Determine Vadose Zone Parameters Most Sensitive to Long-Term Human Health Risk." In Proceedings, American Nuclear Society Conference, April 5-8, 1998, Pasco, Washington.

Buck, J. W., K. J. Castleton, and J. L. Stroh. 1996. "Application of Modular Risk Analysis Approach to the Hanford 200 Area Endstate Analysis". Society For Risk Analysis Conference, December 4-7, 1995, Honololu, Hawaii.

Whelan, G., J. W. Buck, A. Nazarali, and K. J. Castleton. 1996. "Assessing Multiple Waste Sites Using Decision-Support Tools." In: Application of Geographic Information Systems in Hydrology and Water Resources Management. K. Kovar and H.P. Nachtnebel (eds.) International Association of Hydrological Sciences. Publication No. 235. IAHS Press, Institute of Hydrology, Wallingford, Oxfordshire, OX10 8BB, United Kingdom. pp. 373-381.

Buck, J. W., K. J. Castleton, and J. L. Stroh. 1995. "Application of the Modular Risk Analysis Approach to the Hanford 200 Area Endstate Analysis." Society for Risk Analysis. Honolulu, Hawaii.

Droppo, J. G., Jr., J. W. Buck, G. Whelan, D. L. Strenge, K. J. Castleton, and G. M. Gelston. 1995. "Large-Scale Multimedia Modeling Applications." American Institute of Chemical Engineers. Boston, Massachusetts.

U.S. EPA Office of Research and Development, 1999 Documentation For the FRAMES-HWIR Technology Software System, Volume 6: Multimedia Multipathway Simulation Processor; Reference Number DW89937333-01-0

U.S. EPA Office of Research and Development, 1999 Documentation For the FRAMES-HWIR Technology Software System, Volume 7: Exit Level Processor; Reference Number DW89937333-01-0

U.S. EPA Office of Research and Development, 1999 Documentation For the FRAMES-HWIR Technology Software System, Volume 8: Specifications; Reference Number DW89937333-01-0

U.S. EPA Office of Research and Development, 1999 Documentation For the FRAMES-HWIR Technology Software System, Volume 10: Facilitating Dynamic Link Libraries; Reference Number DW89937333-01-0

U.S. EPA Office of Research and Development, 1999 Documentation For the FRAMES-HWIR Technology Software System, Volume 13: Chemical Properties Processor; Reference Number DW89937333-01-0

Whelan G., K. J. Castleton, J. W. Buck, G. M. Gelston, B. L. Hoopes, M. A. Pelton, D. L. Strenge, and R. N Kickert. 1997. Concepts of a Framework for Risk Analysis in Multimedia Environmental Systems (FRAMES). PNNL-11748, Pacific Northwest National Laboratory, Richland, Washington .

Buck, J. W., L. M. Bagaasen, M. P. Bergeron, G. P. Streile, L. H. Straven, K. J. Castleton, G. M. Gelston, D. L. Strenge, K. M. Krupta, R. J. Serne and T. A. Ikenberry. 1997. Analysis of the Long-Term Impacts of TRU Waste Remaining at Generator/Storage Site for No Action Alternative 2. PNNL-11251, Pacific Northwest National Laboratory, Richland, Washington.

Hay, B. P., K. J. Castleton, and J. R. Rustad. 1996. Stability Constant Estimator User's Guide. PNNL-11434, Pacific Northwest National Laboratory, Richland, Washington.

Buck, J. W., G. Whelan, J. G. Droppo, Jr., D. L. Strenge, K. J. Castleton, J. P. McDonald, C. Sato, and G. P. Streile. 1995. Multimedia Environmental Pollutant Assessment System (MEPAS) Application Guidance, Guidelines for Evaluating MEPAS Input Parameters for Version 3.1. PNL-10395, Pacific Northwest Laboratory, Richland, Washington.

Mahaffey, J. A., B. L. Harper, T. A. Ikenberry, R. D. Stenner, J. W. Buck, J. S. Dukelow, Jr., L. H. Staven, P. S. Kaae, S. F. Snyder, N. C. Batishko, G. M. Gelston, S. W. Gajewski, N. C. Van Houten, K. J. Castelton, B. R. Warren, and M. S. Peffers. 1994. Integrated Risk Assessment Program: Methodology and Results from Qualitative Evaluation of Current Hanford Site Risks to the Public. PNL-10154. Pacific Northwest Laboratory, Richland, Washington.

Whelan, G., J. W. Buck, K. J. Castleton, J. P. McDonald, C. Sato, G. M. Gelston, A. deHamer, R. J. Serne, S. K. Wurstner, and R. N. Kickert. 1994. □ Unit Environmental Transport Assessment of Contaminants from Hanford's Past-Practice Waste Sites. PNL-10233. Prepared for the U.S. Department of Energy by Pacific Northwest Laboratory, Richland, Washington.

RESUME

Name: ARUN EKTARE

ADDRESS: Professor, Department of Computer Science
Mesa State College
1100 North Avenue
Grand Junction, CO 81501
Tel: (970)248-1859
E-mail: arun@mesastate.edu

US Citizen

Education:

PhD, University of Roorkee (now IIT, Roorkee), India, 1981

M.Engg.,University of Roorkee, India, 1969

B.Sc.Engg. (Electrical), University of Indore, India, 1967

Professional Experience:

1. 1986-present Professor at Mesa State College
2. 1982-1986 Associate Professor, University of Technology Baghdad, Iraq
3. 1973-1982 Associate Professor, University of Roorkee Department of Electronics & Communication Engineering
4. 1972-1973 Senior Research Fellow (Council of Scientific and Industrial Research, Gov. of India)
5. 1970-1972 Faculty in Military College of Telecommunication Engineering, MHOW, India.

Teaching Experience:

In over 4 decades of teaching, I have taught various courses in Computer hardware, software and Control Systems. The courses range from Compute Architecture, Logic Design to Programming Languages (C++,JAVA, Assembly language), Web Design, Computer Networks, Operating System Design and Software Engineering.
I introduced the course Software Engineering and have been teaching the course for a decade. The students design software for local business applying the rules of Software Engineering.

Research Experience:

1. I have published (or presented) about 20 papers in International Journals and conferences. (list enclosed)
2. I have encouraged students to present papers based on their projects in regional and local symposiums. So far about 20 students have given presentations in last 12 years.
3. **I established a Computer Research Laboratory where students can try out new ideas on a computer network. The network was put together by students. The projects implemented include implementing MPI and Computer Graphics projects.**
4. In India, I supervised several Graduate dissertations and one Ph.D. thesis titled "On Modeling and fault studies of multistage cube inter-connection network " at University of Roorkee.
5. In Baghdad, I supervised Two M.S. Dissertations.

Current Interests:

1. Multi-core Programming
2. Bioinformatics

Memberships:

1. Member IEEE
2. Member ACM

Honors:

1. State Scholarship holder in undergraduate education.
2. University Grant Commission (Gov. of India) scholarship in graduate school.
3. Listed in Who's Who in West (USA)

Other Activities:

1. ACM Reviewer for more than a decade
2. Past-reviewer IEEE Computer Society
3. College representative of Colorado Space Consortium ,Colorado University, Boulder, CO for 6 years.
4. Served on Mesa State College Senate for three years.
5. Member representative ,elected from department, on Tenure and Promotion Committee.

PUBLICATIONS AND PRESENTATIONS:

1973 *Modern Guidance & Navigation Systems* ITE Conference, New Delhi, India

1974 *On minimization of linear sequential machines* Conf. Computer Society of India, New Delhi

1975 *Derivation of fault detection tests using boolean matrices*
Int. Jl.of Elctronics,vol.44, No.2

1979 *A boolean matrix approach to the logic design using multiplexers*
ACM Comp.Sci.Conf,Dayton,Ohio

1980 *A simple algorithm to the logic design using multiplexers*
Radio & Elect. Engg.,IRE Jl(UK) vol.5,No.7

On the logic design using multiplexers & spectral techniques
Appl.of Walsh Functions & sequency theory,IEEE Society,October, Baltimore

Graph theoretic approach to fan-out free functions
Comp.& Elect.Engg(USA),Fall, Vol.17,No.3

Multiplexer logic circuit design using cubical complexes
Electronic Letters(UK),vol.16,No,13

An algorithm for designing multiplexer logic circuit
Int.Jl.of Electronics(UK),Vol.49.No.2

Probabilistic approach to multiplexer logic circuit design
Electronic Letters(UK),Vol.16,No.18

1982 *Input assignments in multiplexer logic design*
ACM Comp.Sci.Conf, Minneapolis

1989 *A matrix oriented approach to logic design*
1st Great Lakes Comp.Sci.Conf., West Michigan University,Kalamazoo, Oct. 18-20

2004 *A COURSE ON SOFTWARE ENGINEERING : EXPERIMENTS AND LESSONS*
Mountain Plains 46th Annual Conference
October 14 – 16, 2004 Mesa State College Grand Junction, Colorado

With Graduate Students:

1981 *Multidimensional binary search method*
CSI Conf.,New Delhi,India

1984 *Fault diagnosis of alignment networks using Petri Networks*
Int.Jl.of Electronics(UK),Vol.156,No.2

Matrix representation of Staran Interconnection Network
Comp.& Elect.Engg.(USA),Vol.11,No.1

On the fault diagnosis of multistage cube alignment network
27th Technical Conv.,IETE,India

1985 *SILENSA- an educational tool*
Western EducationalConf.,Oakland,CA,Nov.21-23

1986 *An experimental microprocessor testing system*
IECON'86,12th Annual IEEE Ind.Elect.Soc. Conf.,Milwaukee, Sept.29-Oct.3

Function symmetries & decoded-PLA realizations
Int.Jl. of Elect. (UK), June

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Experience

- Professor of Computer Science, Mesa State College, September 2001 to present. Many roles, with main areas in web development, computer security, and robotics/embedded systems. NASA Colorado Space Grant co-coordinator. ACM Regional Contest Director.
- Consultant for the Bureau of Reclamation on hardware and software for canal automation, August 2008 to present.
- Software developer for Team Mojavaton, fully autonomous vehicle entry in the DARPA Urban (2005, finalist) and Desert (2007, semi-finalist) Challenge.
- Faculty Fellowship at Pacific Northwest National Laboratories (Environmental Technology Division), Winter, 2002. Developed dynamic GUI framework for the development of simulation user interfaces.
- Security Consultant, Strong Bear Garden, Fall, 2002. Implemented AES and did security related code audits for secure usb drive application.
- Web consultant for JobxRx, now www.hospitalsoup.com. Developed secure back-end for second generation of web site.
- Associated Western Universities Fellow at Pacific Northwest National Laboratories (Hydrology Group), Summer, 1998. Numerical Analysis for highly parallel groundwater contamination model. Automated the symbolic construction of specialized numerical solvers for highly nonlinear chemical reaction equations.
- Alpha-spectra, Fall 1997. Crystal growth process improvement. Mathematical analysis of cracking problem during the cooling process (with trade secret solution).
- Associate Research Scientist, Courant Institute, Oct. 1994 to August, 1996. Applied mathematics related to D'Arcy's law and Ohm's law in electro-osmosis and electro-phoresis.
- Consultant, Schlumbeger-Doll Research, Oct. 1994 to August, 1996. My primary role here was the same as my work at the Courant Institute.
- Research Assistant, Arizona Research Laboratories, Micro circulation Division. May 1993 to May 1994. My primary role was to administrate a small SUN/PC network.
- Research Assistant, Los Alamos National Laboratory, group T-7. Oct. 1992 to Sept. 1993, and May 1991 to Sept. 1991. My primary role was to develop and

implement massively parallel algorithms for the efficient simulation of nonlinear Hamiltonian partial differential equations. Target architectures were Thinking Machines CM-200, Intel iWarp, and SGI power challenge computers.

- Research Assistant, University of Arizona, Arizona Center for Mathematical Sciences. Sept. 1989 to Dec. 1991. My primary role was to study nonlinear effects in feedback pumped lasers.

Education

- Ph. D., Applied Mathematics from the University of Arizona, December 1994
- M. S., Applied Mathematics from the University of Arizona, Dec. 1990
- B. S., Comp. Sci. and Math from Mesa State College, Grand Junction, Colorado. May 1988.

Honors

- Fellowships & Scholarships: NSF Industrial Postdoc., AWU/OCR Research Fellowships, National NEEDS Scholarship.
- Honor societies: Upsilon Pi Upsilon (computer science), Kappa Mu Epsilon (math) Sigma Pi Sigma (physics).
- Wrote the AI for the first vehicle in the world to complete the semi-finals course at the DARPA Desert challenge.

Publications

- MacEvoy, *Skilled Listening in Java*, Java Developer's Journal, Aug 7, 2007
- MacEvoy, *Lazy Programmers Can Make Cache Today*, Java Developer's Journal, Jan 5, 2005
- MacEvoy and Stadelman, *PC-Controlled RC Device*, Circuit Cellar 2005 #174
- W. MacEvoy, *BPP: The Beasnshell Preprocessor*, Java Developer's Journal vol 9, issue 6
- N. Ercolani, S. Jin, D. Levermore, W. MacEvoy, *The Zero Dispersion Limit of the Odd Flows in the Zakarov-Sabat Focusing Nonlinear Schrodenger Hierarchy*, Internation Mathematics Research Notices, 2003 no. 47

- A. Chilakapati, S. Yabusaki, J. Szecsody, and W. MacEvoy, *Groundwater flow, multicomponent transport and biogeochemistry: Development and application of a coupled process model,* Journal of contaminant hydrology, 2000

- W. MacEvoy and M. Avellaneda, *Electro-osmotic coupling: incorporating larger surface effects with a new length scale.*, Journal of Colloid and Interface Science, 188, 139-149 (1997)

- Editor for: *Java: Start your Engines* and *Java: Behind the Wheel.* Java training manual set.

References

- Lori Payne; Mesa State College; CSMS Dept. Chair; 1100 North Ave.; Grand Junction, CO 81501; lpayne@mesastate.edu; (970) 248-1906

- Phil Kavanagh; Mesa State College; CSMS Dept.; 1100 North Ave.; Grand Junction, CO 81501; kavanagh@mesastate.edu; (970) 248-1955

- Karl Castleton; Mesa State College; CSMS Dept.; 1100 North Ave.; Grand Junction, CO 81501; karl.castleton@pnl.gov; (970) 248-1837

Fellowships: AWU/OCR, National NEEDS, NSF Industrial Postdoc.

- Honor societies: Upsilon Pi Upsilon (computer science), Kappa Mu Epsilon (math) Sigma Pi Sigma (physics).

- Wrote the AI for the first vehicle in the world to complete the semi-finals course at the DARPA Desert challenge.

Teaching Philosophy

Computer Science is a dynamic field, and as such our students must learn to learn on a lifelong basis. Most of our students are interested in a career, which implies they must have practical skills.

To reflect this, most of my courses involve a significant project (which the students are expected to add to their portfolio), and a lot of hands-on work with the topic at hand. In each case, I present the theory and tools to get started, but then encourage them to expand from that point to learn specifics. This is exactly how they will have to approach problems in their careers.

I have taught most of the Computer Science courses offered at Mesa State College

CSCI100 Computers in our society
CSCI106 Web page design 1
CSCI111 Computer Science 1
CSCI112 Computer Science 2
CSCI306 Web page design 3
CSCI310 Advanced Programming
CSCI321 Assembly Language Programming
CSCI330 Programming Languages
CSCI333 Unix operating systems
CSCI375 Object Oriented Programming
CSCI445 Computer Graphics
CSCI450 Compiler Structure
CSCI484 Computer Networks
CSCI486 Artificial Intelligence

I am continuously modernizing the content of the courses to reflect changes in the field, any my yearly evaluations and student evaluations show that I have an excellent understanding of the field and how to teach it effectively.

COURSE	MEDIAN OF MEDIANS
CSC106: Web Page 1	5.00
CSCI321: Assembly Language	4.75
CSCI306: Web Page 3	4.75
CSCI333: Unix	5.00
CSCI396: Embedded Systems	5.00
CSCI375: Object Oriented Prog.	4.50
PHYS196: Space Studies	4.00
CSCI486: AI	5.00
CSCI450: Compiler Design	4.25
CSCI111: CS 1	4.00
CSCI445: Computer Graphics	4.00

Grants / Fellowships

These grants and fellowships have a direct benefit to students through scholarships, research opportunities, and improved laboratory equipment.

As co-director, along with Phil Kavanagh, of the Colorado Space Grant Consortium for Mesa State College, we receive annual funds of about $10,000 as part of the consortium from NASA, which is spent on scholarships, outreach and lab equipment. Last year we also received $30,000 from the Colorado Institute for Technology for a special work-force training course as part of participation in the consortium.

As Rocky Mountain Regional Director of the Association for Computing Machinery, and president of the Denver ACM, we receive annual funds of about $8,000 from IBM for management of the ACM contest. This money is spent on the ACM programming contest management and outreach in support of computer science.

I have additionally received NSF funding for the WECS security workshop at the Naval Postgraduate School, which fully funded my expenses for a workshop on computer security in the summer of 2004. The funding amount was approximately $5000.

Publications

Computer Science is dynamic, and work towards publications is an important way to stay abreast of the field, as well as involve students in undergraduate research.

MacEvoy, Lazy Programmers Can Make Cache Today, Java Developer's Journal, Jan 5, 2005. *This introduces use of lazy caches to improve template performance.*

MacEvoy and Stadelman, *PC-Controlled RC Device*, Circuit Cellar 2005 #174. *This shows how to create a real-time control platform with a PC and RC car. This paper was written in conjunction with a student.*

W. MacEvoy, BPP: *The Beasnshell Preprocessor*, Java Developer's Journal vol 9, issue 6. *This introduces a new concept of symmetric preprocessing and corresponding open-source project,* ***bpp.sourceforge.net.***

N. Ercolani, S. Jin, D. Levermore, W. MacEvoy, *The Zero Dispersion Limit of the Odd Flows in the Zakarov-Sabat Focusing Nonlinear Schrodenger Hierarchy*, Internation Mathematics Research Notices, 2003 no. 47. *This is a study of a special dispersive hierarchy of differential equations in the limit of vanishing dispersivity.*

Editor for: Java: Start your Engines and Java: Behind the Wheel. 2001. *This is a six volume set of training manuals for learning the Java programming language in a 8-hour day/5 day format.*

A. Chilakapati, S. Yabusaki, J. Szecsody, and W. MacEvoy, *Groundwater flow, multicomponent transport and biogeochemistry: Development and application of a coupled process model* Journal of contaminant hydrology, 2000. *This describes the use of a 3D contaminant modeling system.*

W. MacEvoy and M. Avellaneda, *Electro-osmotic coupling: incorporating larger surface effects with a new length scale.*, Journal of Colloid and Interface Science, 188, 139-149 (1997). *This studies electro-osmotic effects at the pore-scale level and finds a new fundamental geometrical parameter for second order electro-osmotic effects.*

Dr. Lori K. Payne

Curriculum Vitae

Education:

- Ph. D. in Educational Technology - Interactive Technology (1996). University of Northern Colorado, Greeley, Co.
  Dissertation: *Mathematical Subject Matter Knowledge and Calculator Use of Elementary Teachers (1996)*
- M. S. in Groundwater Hydrology (1984). New Mexico Institute of Mining & Technology, Socorro, NM.
  Thesis: *A Study of The Effects Of Layering On a Wick System* (1984)
- B.A. in Mathematics & Computer Science (1978). Mesa State College, Grand Junction, CO.
- A.S. Science (1976). Mesa State College, Grand Junction, Co.

Work Experience:

- Professor of Computer Science & Mathematics, Department Head of Computer Science, Mathematics & Statistics - Mesa State College, Grand Junction, CO. (1986 - current)

- Software Engineering Consultant. Self-employed. (1984 - 1991)

- AWU Faculty Fellowship (at RUST Geotech). Summer, 1991.

- Teaching Assistant/Research Assistant - New Mexico Institute of Mining & Technology (1981 - 1983)

- Computer Programmer/Operator - St. Mary's Hospital, Grand Junction, Co. (1977-1981)

- Tax Preparer - H & R Block, Grand Junction, Co. (Tax season, 1981).

Administrative Experience

Department Head of Computer Science, Mathematics, & Statistics (2007- present) - a department with over 20 T/TT faculty, and several adjunct professors. I do all scheduling for the three areas, evaluate all faculty, manage the department budget, represent the department at various college events.

Coordinator of Computer Science (2001-present) - did all scheduling, preparation and monitoring of budgets, and representing Computer Science at meetings, etc.

Honors and Awards

Mesa State College Exemplary Faculty Award (2007)
Who's Who Among American Teachers (2003-2004, 2004-2005)
Distinguished Faculty Award in Service Nomination (2001)

Teaching

I taught full-time for the first 22 years at MSC, but have reduced down since becoming department head. I routinely receive excellent evaluations in my classes, and have always received "Excellent" on my annual evaluations. Since I am interdisciplinary in background, I have had the opportunity to teach a large variety of courses. They include the following:

CSCI 100 Computers In Our Society
CSCI 110& 110L Beginning Programming
CSCI 120 Technical Software
CSCI 111 Computer Science I
CSCI 112 Computer Science II
CSCI 131 FORTRAN Programming
CSCI 133 Pascal Programming
CSCI 180 C Programming
CSCI 250 Data Structures
CSCI 330 Programming Languages
CSCI 337 User Interface Design
CSCI 460 Database Design
CSCI 480 Theory of Algorithms
ENGT 101 Technical Mathematics I
ENGT 102 Technical Mathematics II
ENGT 230 Water Resources Design
Math 090 Basic Algebra
Math 091 Intermediate Algebra
Math 110 College Mathematics
Math 113 College Algebra
Math 121 Business Calculus
Math 130 Trigonometry
Math 151 Calculus I
Math 152 Calculus II
Math 361 Numerical Analysis
Stat 200 Probability & Statistics
Stat 214 Business Statistics

Service

I have been very active in serving Mesa State College over the years, resulting in my nomination for a Distinguished Faculty Award in Service. Following is a list of some of the many service opportunities I have undertaken over the years:

- Coordinator of Computer Science (2001- 2006). Since I received no pay or course release for this work, it was entirely service.
- Computer Science Program Review (2009) - Chair
- Computer Science Program Review (2004) - Chair
- Computer Science Program Review (1998) - Member
- Academy for Academic Excellence (1996-1998) - Member
- Faculty Advisor for ACM (1995 - 2000)
- Human Resources Committee (1998-2001) - Served as EOO/AA representative on numerous search committees including two deans, head of human resources, and faculty members.
- Technology Council (2002-2005)- Chair (2005)
- APQPP - (2008 - present) Review of all academic programs at MSC
- MAA Conference Committee - MSC hosted a 2 region conference (2006). I created the web page and did all computer work (including final financial reports) for the group
- CS Study - Prepared and Analyzed a study of CS 111 students, following the performance and successive CS work

Student Advising

Advisor for Computer Science majors for the last 18 years. I have 35 advisees on average.
SOAR (MSC's freshman advising session) - attend four per year.

Scholarly Activities

Working as an almost-full time faculty member, and half-time administrator leaves little time for research unless it directly pertains to my courses or courses under my supervision. Otherwise, the main scholarly activities I have undertaken over the decades here have been in efforts to keep my computer science skills up-to-date, including learning new languages and application software as they occur. While not counted as scholarship by some administrators and certainly difficult to quantify, work in these areas *is* scholarship in our field. Some of the other activities include those listed below:

- Attended professional development workshop given by **Dr. Ed Neal** dealing with teaching Critical Thinking and Classroom Management held on May 1 - 2, 2008 on MSC campus.

- Attended professional development seminar given by **Dr. Diane Nyhammer** on Program reviews, connecting student learning to goals, and assessing general education held at MSC on January 16-17, 2009.
- **Redesign of College Algebra** - conference at Louisiana State University from April 17 - 18, 2008 on the courses. Following the trip, I wrote a synopsis of their program from distribution to the math faculty for discussions on ways to re-design our math courses.
- "*Reaching the 75% Of Students Who Don't Do the Reading*" (2007)- Attended professional development workshops given by Dr. Linda Nilson, at Mesa State College
- New Mexico Conference on Assessment (2007) - Attended conference
- Technology Survey (2004) - Performed Statistical Analysis for Technology Committee.
- Spanish Survey (2003) - Performed statistical analysis for a study they conducted.
- AWU Faculty Fellowship (at RUST Geotech). Summer, 1991.
- *Research in Calculator Use in Education* (1996) Presentation to M.Ed. Graduate Research Course
- *"Computer Assisted Instruction - An Introduction"* (1997) presentation at FACT conference
- *Mathematical Subject Matter Knowledge and Calculator Use of Elementary Teachers* (1996) by Payne, Lori K. Doctoral Dissertation, University of Northern Colorado.
- *Introduction to Framework* (1992) by Payne, Lori K. & Hawkins, Edwin. McGraw-Hill, Inc. College Custom Series.
- *A Study of The Effects Of Layering On a Wick System* (1984), by Payne, Lori K (Master's Thesis). New Mexico Institute of Mining & Technology.
- *Simulation of Miscible Displacement In Saturated And Unsaturated Porous Media* (1983) by Khaleel, Raz & Payne, Lori K. Hydrology Research Program; New Mexico Institute of Mining & Technology.

Gary M. Rader

September 2009

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EDUCATION

M. B. A., University of Phoenix, 1984.

Ph.D., Computer and Information Science, University of Pennsylvania, 1976.
Dissertation: Computer Generation of Simple Stories and Their Variations.
Committee: Saul Gorn, Rob Ross, Norm Badler, Aravind Joshi, and Ruzena Bajcsy.

M.A., Computer and Information Science, University of Pennsylvania, 1973.
Thesis: An Algorithm for the Automatic Composition of Simple Forms of Music Based on a Variation of Formal Grammars.
Supervisors: Saul Gorn and Constance Vauclain.

B. A., Mathematics, University of Pennsylvania, 1968.

RESEARCH INTERESTS

Artificial Intelligence (Constraint and Example Based Programming, Program Creativity), User Interfaces, Software Engineering (Rapid Application Development), Electronic Commerce, Computational Musicology.

EXPERIENCE

Professor of Computer Science, Mesa State College **1995 - Present**
Grand Junction, Colorado

Teach and develop new undergraduate Computer Science courses and perform various administrative duties.

Proprietor, MusicEase Software **1997 - Present**
Grand Junction, Colorado

Develop and market intelligent, music notation based, software products developed as part of my research.

Associate Professor of Computer Science, Bradley University **1994 - 1995**
Peoria, Illinois

Taught undergraduate and graduate Computer Science courses. Computing environment included networked Sun workstations, UNIX, DOS, PCs, a wide range of software, Internet and Informix.

Associate Professor of Computer Science, American University in Cairo **1993 - 1994**
Cairo, Egypt

Taught undergraduate Computer Science courses, advising students, supervised senior software engineering group projects and performed administrative duties.

President, Grandmaster, Inc. **1984 - 1993**
Spokane, Washington

Specialized in the design of PC software incorporating AI techniques. Commercial products: Office Automation Toolkit, a Lisp based toolkit for quickly creating office software; MusicEase, a constraint-based music score editor for quickly producing publication quality printed music; do-re-mi, a music arranger and accompaniment generator which can be customized using examples.

Associate Professor of Computer Science, Eastern Washington University **1984 - 1991**
Cheney, Washington

Developed and taught graduate and upper division Computer Science courses, supervised graduate theses work, and administered the graduate program.

Researcher, AT&T Bell Laboratories **Spring, 1990**
Murray Hill, New Jersey

Pursued research in computer environments with emphasis on the design and implementation of user interface development systems using distributed computing techniques. Work focused on the construction of an application builder allowing user interface designers to create widget-based user interfaces via direct manipulation.

Member of Technical Staff, Prolink Corporation **1981 - 1983**
Boulder, Colorado

Designed and implemented word processing software for a workstation developed to combine traditional data processing capabilities and telephony.

Member of Technical Staff, AT&T Bell Laboratories **1979 - 1981**
Denver, Colorado

Pursued research in and development of computer interface designs.

Assistant Professor of Computer Science, University of Ife **1976 - 1977**
Ile-Ife, Nigeria

Taught upper division computer science classes and supervised senior projects.

Customer Engineer, IBM **1969 - 1970**
New Haven, Connecticut

Supported IBM 360/OS for customer accounts at Sikorsky Aircraft and New England Telephone.

COURSES DEVELOPED

- A 3 course sequence in Artificial Intelligence (undergraduate and graduate versions).
- A 3 course User Interface Design sequence (graduate level).
- Introduction to X Windows (graduate level).
- Web Page Design I and II (undergraduate level).

COURSES TAUGHT

Computers and Society
Data Structures
Pascal Programming
Fortran Programming
Lisp and Introduction to Artificial Intelligence
Artificial Intelligence II and III
Programming Languages
C++ Programming I and II
Database Management Systems
Seminar in Database Management Systems
Software Engineering
User Interface Design I, II, and III
Introduction to X Windows
Theory of Computability
Formal Language Theory
Web Page Design I and II

PUBLISHED SOFTWARE

Office Automation Toolkit, 1986.
do-re-mi, 1992.
Digital Tradition Folksong Player, 1999.
SongBox and four ***Virtual Hymnal*** programs, 1997-2005.
MusicEase Traditional Songbook, 2003.
MusicEase (notation software), 1988-2009.
Christian Virtual Hymnal, 2005-2009.
The Praise and Worship Song Book, 2007 (published by Brentwood-Benson Music Publishing).
A few dozen CD-ROM songbooks have been published by Integrity Music (2003-2009) using my music viewer software. My music viewer software has also been included as part of Integrity's ***Worship Software*** and ***Worship Kitchen*** and MediaComplete Corp.'s ***Shout Music Manager***.

PUBLICATIONS

Gary Rader. "Creating Printed Music Automatically", IEEE ***Computer***, June, 1996.

Gary Rader. "Helping Naive Users Create Publication Quality Music Scores", *IEEE Tencon 94*, Singapore, August, 1994.

Gary Rader. "Use of Constraints in a Music Scoring Program", *Second International Conference in Artificial Intelligence Applications*, Cairo, Egypt, January, 1994.

Doug Blewett and Gary Rader. "Xtent: a messaging protocol and specification language for Xt", presented at both *Xhibition 90*, San Jose, California, 1990 and *91 MIT Xwindows Conference*, Cambridge, Massachusetts, 1991.

Gary Rader. "A Method for Composing Simple Traditional Music by Computer", ***Communications of the ACM***, November, 1974.

Gary Rader. "An Algorithm for the Automatic Composition of Simple Forms of Music Based on a Variation of Formal Grammars", Moore School of Engineering Technical Report 73-09, University of Pennsylvania, 1973.

PROFESSIONAL SOCIETIES

Association of Shareware Professionals.

PERSONAL PROFILE

Born and raised in Spokane, Washington. I have traveled extensively in West Africa, Europe, Asia and Mexico. I enjoy both downhill and cross country skiing, folk dancing, rollerblading, bicycling, music composition, chess, and playing guitar and singing.

ANNE SPALDING

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

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EDUCATION

Ph.D. Applied Mathematics, University of Colorado at Denver, 1998
M.S. Applied Mathematics, University of Colorado at Denver, 1996
B.S. Applied Mathematics (Magna Cum Laude) University of Colorado at Denver, 1993

ACADEMIC EXPERIENCE

2004 - Present	Associate Professor, Department of Computer Science, Mathematics and Statistics, Mesa State College
2001- 2004	Assistant Professor, Department of Computer Science, Mathematics and Statistics, Mesa State College
1997 - 2001	Lecturer, Department of Computer Science, Mathematics and Statistics, Mesa State College.
1996 - 1997	Research Assistant, Math Clinic on Prostate Cancer with the University of Colorado Health Sciences Center.
1994 - 1997	Teaching Assistant/Lecturer, Department of Mathematics, University of Colorado at Denver
1994 - 1997	Lecturer, Department of Mathematics, Red Rocks Community College

Presentations:

1. *Opening up to Open Source,* Mathematic Seminar, Mesa State College, March 2007
2. *Open Source in the Classroom : Designing Graphics and Gaming Courses with FLOSS integration,* Linux Australia Conference- Educational Program Lightning Talks, Sydney Australia, January 2007
3. *The Mathematics of Google Earth,* Mathematic Seminar, Mesa State College, Nov 2006
4. *Conflict and Cooperation: 2005 Nobel Prize in Economics*, Mathematic Seminar, Mesa State College, Nov 2005
5. *NEW AIMS: Network to Enhance Women's Achievements in Math and Science.* Women Count Conference, Boulder, CO, 2003.
6. *Female Achievement in Math and Science,* Community presentation and workshop, Grand Junction, CO 2002.
7. *Math Extravaganza!* MAA Mathfest, Los Angeles, CA, 2000.
8. *Math Club Activities and Math Extravaganza!* MAA Regional Meeting, Fort Collins, CO, 2000.
9. *Applications in Graph Theory: Stable Matching,* US Air Force Academy, Colorado Springs, CO, 2000.
10. *Solving Domination Problems Using Min Plus Algebra,* DIMACS Research Center, Rutgers College, New Jersey, 1999
11. *How to Make Money in Currency Exchange and Other Applications of Min Plus Algebra,* US Air Force Academy, Colorado Springs, CO, 1999
12. *Shipping Problems and Other Applications of Min-Plus Algebra,* Mathematics Seminar, Mesa State College, 1998.
13. *Mathematics in the Movies,* Mathematics Seminar, Mesa State College, 1998.

14. *Comparison of Two Algorithms for the Domination of Grid Graphs,* Wyoming - Denver Discrete Math Conference, University of Colorado at Denver, 1997.
15. *Repetition in the Min Plus Algebra,* 28th Annual Conference on Combinatorics, Graph Theory and Computing, Boca Raton, Florida, 1997.
16. *Solving Graph Theory Problems using Min Plus Algebra,* MAA Conference, Denver Colorado, 1997.
17. *Using Max-Plus Algebra to solve Optimization Problems,* Optimization Seminar, University of Colorado at Denver, 1996.
18. *Cellular Automaton Models of the Heart,* Bio-math Seminar, University of Colorado at Denver, 1996.
19. *Knights Domination of k x n Chessboards,* MAA Conference, Grand Junction CO, 1995.

Articles:

1. A. Spalding, *Min Plus Algebra and Graph Domination,* Ph.D. Thesis, Department of Mathematics, University of Colorado at Denver (1998).
2. D. Fisher and A. Spalding, *Domination of Circulant Graphs: An Example of Min Plus Algebra,* Congressus Numerantium, v128 (1997), 45-54.
3. *Math Clinic Final Report - Prostate Cancer Models,* Department of Mathematics, University of Colorado at Denver, (1996).
4. A. Spalding, *Cellular Automaton Models of the Heart,* Masters Thesis, Department of Mathematics, University of Colorado at Denver, (1995).

Grants:

1. *Developing a 'Women Interested in Mathematics and Science Advancement' Network in a Rural Community,* NSF Demonstration Planning Grant in the Program for Gender Equity: HRD-0217172, $30,000. June 15, 2002- February 28, 2005.
2. *CS Content Module Development,* Mesa State College Summer Scholars Program, $3000, June 2006

Student Research Collaboration:

1. *Public Key Cryptology*, presented by Sarah Jamison, Mathematics Seminar, Mesa State College, April 2005
2. *Student Internship Reports for Companies in Grand Junction,* presented by Rose Collins, Adam Myers and Robert Tadlock, April 2005
3. *The Traveling Salesman Problem,* presented by Zack Padilla, Mathematics Seminar, Mesa State College, December 2000
4. *Vehicle Routing Problems*, presented by Murray Fisher, Mathematics Seminar, Mesa State College, December 2000
5. *Branch and Bound Algorithms* presented by Don Scott, Mathematics Seminar, Mesa State College, December 2000

PROFESSIONAL EXPERIENCE

2009	Website design and development for *The Synergist Group,* Grand Junction, Co.
2009	Cyfac.org. Development of administrative website and inventory

management system in collaboration with *Forward Thought Software Development Group*, San Francisco, CA.

2006 - Present Collegiate Cycling.org. Development of a component based database driven website with content management; in collaboration with *Forward Thought Software Development Group*, San Francisco, CA.

2000 - 2001 Independent Contracting in Software Development, Database Management and Technical Editing

Technical

1. Web Development: HTML, CSS, JavaScript, PHP, ASP
2. Database: MySQL, SQL, Access
3. Programming Languages: Visual Basic 2008, C, C++, C#

SERVICE

Scholarly

2009 Outdoor Program Hiring Committee
2007 - 2009 Campus Distance Learning and Technology Committee: Chair in 2007/08
2001 – 2008 Co-faculty Advisor for the Association for Computing Machinery Club.
2004 – Present Faculty advisor for Upsilon Pi Epsilon (computer science honor society).
2004 – 2008 Faculty advisor for Mesa State Cycling Team.
2005 – 2008 Campus Curriculum Committee: Vice Chair in 2006/07
2006 Organizing Committee for the MAA Regional Meeting at Mesa State College
2002 - 2003 School of Natural Sciences and Mathematics Curriculum Committee
2000 – 2005 Campus Assessment Committee
2000 – 2005 Fee Allocation Committee – Faculty representative
1997 - 2006 Faculty advisor for the Math Club at Mesa State College.
1998 - 2006 Faculty advisor for the Western Slope Math Extravaganza for high schools.
1997 Co-organizer of the SWARM /Discrete Math Conference at Mesa State College.

Community:

2008 – Present Board Member of National Collegiate Cycling Board
2004 – Present Conference Director of Rocky Mountain Collegiate Cycling Conference
2000 - 2006 Board Member of the American Heart Association
2002 – 2005 Board Member of the Celebrate Girls Program.
2000 - 2004 Board Member for Mesa County Cycling Association
1998 – 2001 Youth Advocate for foster children at Gateway Youth and Family Services
1997 - 2002 Instructor for the Adult Literacy Program at Mesa County Public Library

PROFESSIONAL ORGANIZATIONS

Mathematical Association of America (MAA)
Association of Women in Mathematics (AWM)
Kappa Mu Epsion (KME)
Association for Computing Machinery (ACM)
Special Interest Group in Computer Science Education (SIGCSE)

Review of Computer Science at Mesa State College
October 2009

Briefly, the computer science program at Mesa State College is a gem. I'll be writing this report from the viewpoint of about a dozen years of experience with computer science accreditation.

The two professional societies for the computing field are the ACM and the Computer Society of the IEEE. They have a recommended curriculum and the computer science curriculum at Mesa State follows those recommendations. The curriculum covers the core topics followed by a variety of more advanced courses. They require the expected level of mathematics and sciences rounded out with general education courses. The curriculum is dynamic and improving which is appropriate for a dynamic field. The change with the computer architecture, organization, and assembler courses is the right thing to do (CSCI 241 and 321). Of particular note at Mesa state there is a new course in mobile computing and a variety of experiences available in robotics. That is, state-of-the-art experiences are available for Mesa State students.

The faculty at Mesa State have the background expected for an accredited program. The field of computer science still does not produce enough doctorate degrees to meet demand so I have yet to visit a program where all faculty have graduate degrees in computer science. In fact, research departments often hire outside of the field because of the interdisciplinary nature of computer science—our most recent hire is a biologist. At Mesa State you have Dr. Ektare with a Ph. D. in Electrical Engineering that, if awarded today, would likely be labeled as "computer engineering." Dr. Spaulding has a Ph.D. in Applied Mathematics in the area of graph theory—a field that is so fundamental to the study of computer science that it appears in multiple courses of the core at Mesa State. The one Ph. D. degree that is not in a computing field is Dr. Payne's. Her M. S. degree in Hydrology involved computer modeling, and she has a B. A. degree in computer science. It is notable that the experience and degrees of the faculty at Mesa State broadly cover the field: they range from hardware to theory with a healthy dose of artificial intelligence. Such breadth is unusual for a small program.

The facilities at Mesa State are quite good. The President is credited with a building boom on campus that is impressive, and the computer science program in particular has benefited from those improvements. Both the classrooms and laboratories have been renovated. When meeting with students, the upper class students commented on the improvements they have witnessed, and they recognized the impact of the current administration.

The library is adequate for the department's needs, but there are possibilities for improvements. The two computing professional societies, the ACM and the IEEE, have digital libraries of their publications, but they are extremely expensive. The Safari Books Online series offers a wealth of computer science books online that would be very valuable to undergraduates, but it also is extremely expensive. However, the major universities in the state subscribe to all of those services. One additional license added onto those existing subscrip-

tions could service multiple small colleges' needs. The library is increasing its participation in collaborations with other schools and is looking into ways to provide such access. The Safari collection would be particularly beneficial to computer science students.

Participation in the DARPA robotic Challenges is impressive, especially its direct impact on the undergraduate experience. Two Mesa State faculty, Dr. MacEvoy and Karl Castleton, played significant roles in this challenging task. To put it in perspective, in the first Challenge, multi-million dollar efforts resulted in total failure—one vehicle navigated on its own for a mere seven miles of the 150-mile desert route. A year later the Mesa faculty fielded a machine capable of navigating the whole rural course. Two years later in the third Challenge they fielded an autonomous SUV that could navigate a town in traffic. This effort puts the Mesa faculty at the forefront of the robotic revolution in computing—significant for both the military and the economy. Most importantly, the faculty have brought autonomous robotics into the hands of the students at Mesa State. There is a lab where students work with small versions of the robotic vehicles. In addition, the faculty have taken these smaller vehicles on tour to regional middle and high schools. One student I happened upon in the labs said that he came to Mesa State because he wanted to work on the robots that had come to his high school.

Why did I say that the program is a "gem"? The computer science program is better than one would expect to find in a small school, and it is located well away from more prestigious programs such as one finds in Boulder. As a result, this part of Colorado is better served with respect to computing than one would expect.

Evidence of quality in graduates was presented in results from the Major Field Test. At first glance the results may not seem impressive: Mesa State students are above average. The missing piece is that the students who take that exam tend to be from good, accredited programs. That is, the Mesa State students are being measured against a strong group of students. Performing better than that average is a notable accomplishment.

The impact of the computer science program on the regional community is difficult to assess. Tracking alumni and the impact they have on the regional economy is difficult. However, it is an important point to consider especially given the isolation of the region from the large educational centers of the front range. The alumni I met with spoke of difficulties and expense in hiring computer scientists from outside the region. What would be the impact on the regional economic community, if there were no computer scientists available locally?

Few weaknesses showed up in this review of the computer science program. The mathematics most relevant to the study of computer science is not the continuous world of calculus, but the very different world of discrete mathematics. However, students identified the discrete mathematics course as the least relevant—the opposite of what one would expect. The problem seems to be based in the fact that mathematicians teach the course with little appreciation of its role in computing. Fixing this problem should be reasonably easy to

accomplish.

Two other issues are potential weaknesses that will depend on how they are handled. The department plans to add courses that cover additional programming languages. Well-educated computer scientists such as students in this program don't need much additional instruction in language: if you have mastered one of the major languages you can easily pick up many others. However, such courses can be a useful service to other disciplines such as CIS or as a service to people in the community. It is possible that a course in a significantly different language could be of value to majors, but other elective courses will be most valuable to most students. That is, the courses can be a great service to others, but a major should not fill their program with a bunch of languages. At this point, it is not clear how the major degree requirements will be handled.

The software engineering course combines both software engineering and a large project within one course. It appears to work reasonably well. We had a similar course and found that splitting it into two courses was an improvement. The first course was all software engineering; the second was only a project—a capstone course. Later we refined our curriculum to have a sophomore-level course that was a brief software engineering introduction combined with advanced programming—the full software engineering course became an elective. We found that to be a further improvement that we are happy with. Mesa State may want to look into a similar model to see if it is appropriate for them.

I saw little evidence of work on oral communication skills in the curriculum. It was not evident in the materials provided. It may be there, and I missed it. Oral communication is a critical skill for computer scientists. If you have the best ideas, but cannot communicate them, you will not be successful. Similarly, I believe that there is not enough emphasis on teamwork. Teamwork exists, but more would be better. Both of these skills could be developed in a capstone course, but could not be added to the already full software engineering course.

A final weakness is the inability of faculty to be supported for conferences. Conference attendance is critical for keeping up-to-date in such a fast moving field. However, it is unreasonable to expect a funding increase in the current economic environment. If money is unavailable internally, you must look externally. If the department plays a significant role in the region, it might be possible to leverage the regional alumni and regional employers to support the department—particularly with travel.

Enrollment trends are an interesting aspect of computer science. After the dot-com boom and bust, computer science enrollments were down significantly at all institutions. From my experience the decline reflected the attitudes and fears of students and their parents rather than actual job prospects. For most computer science graduates there were jobs, but fewer choices. Less well prepared students in IT fared much worse. Now the national trend is that enrollments are increasing rapidly, and indications are that enrollments have not yet peaked. How is Mesa State poised for these increases? It appears that most classes in computer science are not full so that capacity exists. In addition, Mesa State appears to have flexibility with respect to labs that can be

shared with CIS. It appears that Mesa State computer science can handle some increase in enrollment. The efforts of the robotics group in visiting regional schools should add to the increase.

What is the role of computer science within Mesa State? Hundreds of students take a computer science course as general education credits. In fact, the self study reports that half of computer science credits are taken by non-majors. That is an important service. However, it could be greater. One positive step already taken is the addition of a required course for Engineers (CSCI 130). Computing is essential to modern engineering so that is a great service to the college. There is a national conversation on the role of computational thinking for everyone. It is a developing concept that is not ready for general implementation. However, it is something for the college to keep track of because I believe that it will play a significant role in general education. A healthy computer science department will allow the college to participate.

In summary, the computer science department at Mesa State provides a solid education to its majors, provides a useful service to the college, and plays a role in the community. The senior faculty have established the program, and the junior faculty are energizing the program through their enthusiasm. Overall, I was impressed.

Dr. Richard Enbody
Department of Computer Science and Engineering
Michigan State University, East Lansing, MI