COLORADO MESA
U N I V E R S I T Y

AY 2014 – 2015
Program Review

Computer Information Systems

Colorado Mesa University
Computer Information Systems
Program Review Self-Study 2008-2014

1. Introduction and Program Overview

Introduction

The Computer Information Systems faculty provide several programs of study and many courses that are used both in the CIS programs and in many other programs. As such, the CIS faculty play integral roles in the curriculum of many departments, most notably the Department of Business, which will be explained in the sections below. As the world's reliance on information expands, the CIS faculty stand ready to expand those roles and continue/provide leadership on campus, especially in the many aspects of information literacy. Those roles are mentioned periodically in the following sections and are stressed in the Vision section. Overall, CMU's CIS program is healthy, thriving, and has a promising future. This is reflected in the student and faculty successes presented in this self-study along with the increased demand for CIS courses.

A. Program Overview

The Computer Information Systems (CIS) Program currently offers programs at the baccalaureate, associate and certificate levels, a minor, concentrations, and support courses for other disciplines. Specifically, CIS offerings include a Bachelor of Science (BS) in Computer Information Systems, providing students with skills to manage computer systems in today's organizations; a Bachelor of Applied Science (BAS) in Computer Information Systems, allowing students who have already earned an associate of applied science degree to build upon their technical specialties; a Bachelor of Business Administration (BBA) with a concentration in Information Systems, combining business expertise with information systems and applicable in various fields such as medicine, the arts, sports and education; a BBA with a concentration in Managerial Informatics, giving graduates skills in analyzing information in a variety of specialized areas in business; an Associate of Arts (AA) in Liberal Arts Emphasis in Business Computer Information Systems, designed for students who intend to continue their education and receive a baccalaureate degree; a Minor in Computer Information Systems, allowing students majoring in other subjects to enhance their degrees with information systems knowledge; and a Decision Support Systems Certificate, which exposes students and managers to the knowledge and skills needed to use computer software to solve business problems and to support decision making. The CIS Program also provides support courses required in numerous other programs, especially the Department of Business.

B. History

Highlights of the history of Colorado Mesa University's Computer Information System program include:

1960s – First data processing courses were offered, as well as a nine-month certificate in DP.

1972 – Associate of Applied Science in CISB was created.

1980 – Concentration in Computer Information Systems in Business (CISB) was added to the Bachelor of Business Administration.

1996 – AAS in CIS changed to Associate of Arts in CIS to facilitate transfer students.

1998 – Minor in Business Computer Information Systems was created (first offered in 2000).

1999 – CIS curriculum modified and mapped to IS 1997 model curriculum.

2002 – Bachelor of Science in CIS offered for students entering in fall.

2002 – CIS concentration in BBA was dropped.

2003-2006 – Mapping CIS curriculum to IS 2002 model; courses added, modified & deleted.

2003-2006 – Alignment of programs and procedures in preparation for accreditation by the Accrediting Board for Engineering and Technology (ABET).

2007 – Pursuit of ABET accreditation suspended due to lack of resources

2007 –Bachelor of Applied Science in CIS offered as a completer degree for those who hold an AAS in any CIS-related discipline.

2008 – CISB 101, 210, 241, and 341 required courses in the BBA

2009 – BBA concentration in Managerial Informatics and Certificate in Decision Support added.

2010 – BBA concentration in Information Systems added.

2011 – Realigned courses in all CIS degree programs.

2012 – Participation in Medical Informatics began.

2013 – Realignment to IS2010 Model Curriculum; three courses added.

2014 – Business Department adopts SLO of "Strategic Information Systems Knowledge"

C. Recommendations from Previous External Reviewer

The previous external reviewer pointed out several items for consideration. Key recommendations and the corresponding actions taken regarding those include the following:

The reviewer felt the CIS faculty might better articulate linkages between the institution's mission and objectives and those of the CIS program. Changes have occurred at the university, department, and program level that facilitate improved articulation of linkages between the university's mission and objectives, the departmental mission and objectives, and the program's mission and objectives. He pointed out program sheet and catalog corrections, which were primarily oversights and were corrected shortly after the review. He indicated the need for CIS faculty to consider altering course objectives or to develop some other mechanism to clearly communicate the numerous places where communications skills, ethical standards and teamwork are covered in the CIS program curriculum, and to ensure that appropriate coverage would be given to those topics. Revisions made over the past few years to the student learning outcomes at the department and program levels include several dedicated to these topics and various projects and exercises specifically aim to emphasize these skills and standards.

He expressed concerns about a lack of coverage in the program at that time on topics such as multimedia, web applications, capacity planning, geographic information systems, and decision support. Some of the topics such as geographic information systems and multimedia are taught in other departments at Colorado Mesa University (CMU) but the others were, in fact, embraced in the CIS area. For example, courses supporting decision making were added, and a decision support certificate was created. He also suggested offering electives like systems security, which is a topic addressed in most, if not all, CIS courses. Another course that was offered as an elective at the undergraduate and graduate levels is CISB 410 Project Management. Subsequently, 410 has become a required course in the new model curriculum.

He thought more might be done to strengthen alumni relationships, to maintain closer relationships with employers, and to create more internships for CIS students. Alumni are routinely encountered in the Grand Junction community, and are often seen visiting on campus. Alumni also participate in AITP activities by being guest lecturers and giving tours of the IT/IS shops where they are employed. Internships have been centralized in the business department, under the control of a one business professor. A decentralization and course release for a CIS faculty member would greatly enhance the internship opportunities for the CIS students, as well as enhance the employer/CMU relationship potential.

The reviewer offered recommendations on course load for CIS faculty. Efforts have been made to give faculty four course and three prep loads, but since the CIS faculty often also teach management, marketing, or MBA courses, there are often overloads and multiple course lecture preparations for some faculty.

He expressed concerns about replacement plans for the CIS lab computer systems. Since then the university has developed replacement cycles for the computers and technology has changed the need for some of the equipment. The reviewer suggested that the required course in the BBA be changed from CISB 101 to CISB 210. The CIS faculty concurred, and took the recommendation to the business department faculty. The Department decided to include both courses in the requirements for business students.

He felt the CIS faculty could explore joint programs in medical and governmental informatics. In 2012, the CIS faculty engaged in the on-line Medical Informatics undergraduate and graduate professional certificates with the Health Sciences department. CISB 410 and 470 are in the undergraduate certificate; CISB 505 and 500, in the graduate certificate.

The reviewer also felt the CIS faculty could find additional ways to reach out to students who have not yet declared a major. CIS faculty give presentations in every section of BUGB 105, Freshman Business Seminar, as an introduction to the discipline for the freshmen business students. The student chapter members of AITP also give presentations in lower division classes to introduce the students to the discipline and to advertise the club. Further, the AITP routinely hosts informational tables at the welcome back night for the business students and at the CMU club fair held twice a year. The student chapter also hosts games at the homecoming carnival and other general campus events hosted by the CMU student government. The AITP chapter also operates a Computer Heroes program which offers computer trouble-shooting and repair services for donations to the club. All of these activities enhance the reputation of the student club in the CIS area as well as the CIS program itself.

The reviewer also suggested that the CIS faculty explore opportunities to offer sections online. Since the review, CIS faculty have expanded delivery methods and now routinely offer CISB 101, 210, 410, 460, 470, 500, 505, and 560 as on-line courses.

At the time of the review, the CIS faculty were planning to request pursuit of accreditation through ABET. As the program review concluded, the CIS faculty learned that one of the four tenured/tenure-track positions was to be vacated. ABET accreditation required 75% of the CIS faculty to have a terminal degree in discipline. With only two terminally-degreed faculty in the three remaining positions, ABET accreditation was no longer viable. Due to cost and resource constraints, the CIS faculty decided not to pursue accreditation at that time.

D. Program Centrality to CMU's Role and Mission

CMU's Institutional Mission Statement states: "Committed to a personal approach, Colorado Mesa University is a dynamic learning environment that offers abundant opportunities for students and the larger community to grow intellectually, professionally, and personally. By celebrating exceptional teaching, academic excellence, scholarly and creative activities, and by encouraging diversity, critical thinking and social responsibility, CMU advances the common good of Colorado and beyond." CMU's statutory role and mission states: "There is hereby established a university at Grand Junction, to be known as Colorado Mesa University, which shall be a general baccalaureate and graduate institution with selective admission standards. Colorado Mesa University shall offer liberal arts and sciences, professional and technical degree programs, and a limited number of graduate programs, including career and technical education programs. Colorado Mesa University shall receive resident credit for two-year course offerings in its commission-approved service area. Colorado Mesa University shall also serve as a regional education provider."

The CIS Program fits well in the role and mission of CMU by providing professional and career oriented degrees, helping students to grow professionally by adding information systems skills in today's information-based world, as well as serving students from within the region and state, and other states.

E. Program Support for Other Majors

The CIS faculty support other programs as follows:

CISB 101, 210, 241, and 341 are required courses in the BBA program.

CISB 305, 306, 460 are required or named electives in some BBA concentrations.

CISB 101 and 210 are required in the on-line BAS in Public Administration.

CISB 410, 470, 500, 505 are required in on-line Professional Certificates in Medical Informatics.

CISB courses can be used as electives in the BBA and the BS in Computer Science.

CISB 205 is required in the BS in Public Accounting and BS in General Accounting.

CISB 101 is a required course in the BS Nursing, AS Sport Management, BS Sport Management, AAS Culinary Arts, AAS Baking & Pastry, BS Construction Management, AAS Sustainable Agriculture, AAS Hospitality Management, BA Music Business, and the AA Business Administration. It is also a deficiency course in the MBA program.

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CISB 101 is also a course in the Applied Studies category of the General Education program. As the General Education program is being replaced effective Fall 2015 by the Essential Learning program (EL), which does not have an Applied Studies category, CISB 101 will not be used as an EL course. Whether its absence from EL will influence some of the departments that now require CISB 101 in their programs is also not yet known. In the future, however, EL will include an "information literacy" student learning outcome (SLO) which may allow a CISB course to satisfy this category. The CIS faculty have an interest in being involved in the creation and implementation of that new EL SLO.

F. Locational/Comparative Advantage

The need for professionals to understand and manage information systems is as great on the Western Slope of Colorado as it is anywhere. Providing degrees in CIS at CMU allows students to pursue learning such skills here rather than from Denver schools, and gives local organizations resources in the form of prospective employees and assistance with their information systems. Additionally, the BAS in CIS allows students who are earning AAS degrees from WCCC in areas such as telecommunications to continue their education by folding the credits they have earned into a four-year degree program.

The CIS department, being at the crossroads of information technology, data analysis, and system management, is uniquely positioned to provide educational opportunities for students (and faculty, staff and community members) in other disciplines, as these disciplines encounter data management needs.

G. Unique Characteristics

Although the CIS program did not pursue ABET accreditation, the faculty continue to follow the national curriculum model and standards, (IS 2010: Curriculum Guidelines for Undergraduate Degree Programs in Information Systems) and to assess the program using the same exam that accredited programs do to compare graduating students with those from accredited programs across the nation. CMU CIS students' extraordinary success on that exam is explained in the next section.

2. Curriculum
A. Breadth, Depth and Level of the Discipline

Information Systems as a field of academic study goes by multiple monikers (MIS, CIS, IS). The breadth of the IS discipline continually expands, as do the related computer science and information technology fields. An IS model curriculum is created to address the process involved in developing information systems for the modern enterprise. Although there exists myriad job titles related to that activity, perhaps the most common is system analyst.

Colorado Mesa University's baccalaureate degrees related to computer information systems (BS in CIS, BAS in CIS, and BBA in IS) each include courses that are mapped to the national IS model curriculum. The BS program was proposed in 2001 in alignment with the IS'97 model but was changed in 2003 to the IS2002 model. Presently, the structure of the courses in the three baccalaureate degrees is in transition to the IS2010 model. Incoming students in 2013 and 2014 use program sheets that reflect the IS2010 model, while previous students' program sheets reflect the IS2002 model.

The most significant measure of success of the CIS programs is based on the model curricula's link to the examination for the Information Systems Analyst Certification. At CMU, 139 CIS students have taken that exam since 2003 with 77% of them qualifying to apply for the ISA Certification. In the period of the previous CIS program review, the IS exam pass rate was 74%. Since the last CIS program review in 2008, the ISA exam pass rate has been 84.2%, indicating an increase since 2008 in the effectiveness of the program. The high ISA exam pass rate demonstrates the CIS programs are successful in meeting the primary objective: to educate and train information systems analysts. Since the specialized knowledge SLO of the CIS program is also tied to the ISA exam pass rate, the most specific SLO is achieved.

The curricular offerings in CIS often overlap to some extent between programs but each degree offered has a specific set of requirements tailored to meet specific purposes.

The BS in CIS Program requires (beyond the general education requirements) 12 semester hours of Foundation courses including Principles of Financial Accounting, Advanced Business Software, a beginning programming course, and Fundamentals of Information Systems. The major requirements are then divided into 27 semester hours of CIS Core courses with courses like Database Administration, IS Infrastructure, Advanced Business Programming, Project Management, and Systems Analysis and Design; 21 semester hours of required business support courses with classes in Accounting, Economics, Finance, Marketing, Management and a class on the Legal Environment of Business; 6 semester hours of required quantitative analysis courses, and 17 hours of elective courses.

The BBA concentrations offered in CIS require 17 hours of foundation courses, 33 semester hours of the Business Administration Core, 30 hours of concentration courses, 15 hours of concentration electives, and 3 hours of general electives.

The BAS degree requires 36 hours be brought in from a state approved Associate of Applied Science degree, 37 hours of general education and applied studies, and 39 hours of required CIS courses.

Beyond the general education requirements for the AA degree, the CIS Emphasis requires 18 hours of business and CIS courses.

The CIS and Managerial Informatics Minors each require 21 semester hours of prescribed CIS courses.

The Decision Support Professional Certificate requires three specified CIS courses.

The program continues to be updated to follow the national curriculum guidelines for CIS programs (IS2010 Model) but the CIS faculty elected to continue including more programming than the Model Curriculum suggests is required. Graduates indicated a need for programming skills when seeking employment. The curriculum is both broad and deep and is continually undergoing revision to keep it up-to-date.

B. Program Currency and Curricular Changes since last Program Review

The 2007 program review covered the CIS programs from the inception of the BS in CIS in 2002, although Business Computer Information Systems had existed as an AAS in 1972, a concentration in the BBA in 1980 and a minor in 1999. In 2002, the CIS baccalaureate degrees followed the IS2002 model curriculum. Every year, CIS faculty face the challenge of updating their courses to match the plethora of latest developments in the IS field. Course descriptions and student learning outcomes have been designed to allow such changes without having to formally make changes through the campus curriculum modification process.

In 2012, after carefully studying the new model curriculum for two years, the CIS faculty decided to make the signification change to align the BS in CIS, BAS in CIS, and BBA in IS with the IS2010 model curriculum. Three undergraduate courses were added: CISB 310 Enterprise Architecture, CISB 315 IT Infrastructure, and CISB 410 Project Management. (CISB 505 Advanced Project Management was also added as an elective for MBA students.) Three courses were removed from those three degrees: CISB 260 Information Systems Architecture, CISB 400 Data Communications and Network Management, and CISB 460 Electronic Commerce Systems. CISB 260 and CISB 400 will be deleted or deactivated after their service to current students has lapsed. CISB 460 (and the more advanced CISB 560) will be kept as they serve as electives to other programs. Movement to the IS2010 Model Curriculum also necessitated revisions to other CISB courses and some prerequisite changes.

By following the IS2010 model curriculum and by continually updating the CISB courses, the CIS faculty are assured of currency of the program.

Other curriculum changes since the last program review in 2007 include: creation of the BBA concentration in Managerial Informatics and two included courses (CISB 305 and CISB 306), creation of CISB 241 Introduction to Business Analysis and its inclusion in the BBA as a prerequisite to CISB 341 Quantitative Decision Making, and the complete overhauls of CISB 101, Business Information Technology and CISB 210, Fundamentals of Information Systems.

C. Program Delivery Locations and Formats, Meeting the Changing Needs of Students

The primary delivery mechanism for CISB courses is face-to-face in class room/labs in Dominquez Hall due to the computer access needed in most CISB courses. CISB 101 is offered each semester in Montrose. Credit for CISB 101 had been given to students who passed equivalent courses at Hotchkiss High School and Fruita-Monument High School and discussion was in process to expand that to other Grand Valley high schools. However, high school budget cuts forced those school districts to discontinue that program.

CISB 101 and 210 are offered on-line each term to support remote students in the BBA program and the on-line BAS in Public Administration. CISB 410, 470, 500 and 505 are offered each year as on-line courses to support the online undergraduate and graduate Health Informatics programs.

3. **Analysis of Student Demand and Success (narrative describing trends related to following data, identifying any program-specific admissions criteria and commenting on program's growth potential)**

   A. **Number of majors (by concentrations and minors)**

The Department of Business has a number of options for students interested in information systems. The number of students in each area along with the year (data collected for the period 2009 – 2014 by the Office of Institutional Research) is given in Table 3.1.

Table 3.1
Students by Major and Year

Year	BS in CIS	BAS in CIS	Pre CIS	Minor CIS	Minor M.I.*	Totals
2009-2010	38	3	17	3	0	61
2010- 2011	34	7	21	6	1	69
2011-2012	42	12	11	8	0	73
2012-2013	46	10	1	7	1	65
2013-2014	39	7	1	3	1	51

*M.I. = Managerial Informatics

   B. **Registrations and student credit hours by student level;**

The number of student credit hours (SCH) generated in CIS courses by student level is given in Table 3.2. There has been a consistent increase in the number of SCH in most categories as well as the overall total. Having a certificate in Decision Support (9 credits) and two courses in the MBA program leads to the variability in the PostBac and Non-degree and Grad columns.

Table 3.2
SCH by Student Level

Year	Freshman	Sophomore	Junior	Senior	PostBac and Non-degree	Grad	Totals
2009-2010	312	558	330	717	15	12	1944
2010- 2011	474	822	453	812	12	18	2591
2011-2012	468	1008	624	879	6	21	3006
2012-2013	546	1125	777	898	6	15	3367
2013-2014	846	1364	930	873	15	30	4058

   C. **Registrations and student credit hours (fall and spring terms) subtotaled by course level;**

Table 3.3 gives a summary of the SCH produced in CIS classes grouped by class level. Overall, a strong growth pattern is seen in the SCH production by the CIS faculty, exceeding 100% growth in the last five years.

Table 3.3
SCH by Class Level

Year	100	200	300	400	500 (Grad)	Totals
2009-2010	870	561	270	240	3	1944
2010- 2011	897	1197	238	253	6	2591
2011-2012	1227	1281	253	224	21	3006
2012-2013	1536	1359	268	189	15	3367
2013-2014	1914	1608	303	209	3	4037

D. Number of graduates (by concentration)

Table 3.4 lists the number of graduates from the CIS program. Omitted is the certificate in decision support, which requires CISB 205, CISB 305, and CISB 306. There have been fourteen certificates awarded during the four years it has been in the catalog.

Table 3.4
Number of Graduates in CIS

Year	BS in CIS	BAS in CIS	BBA in CIS and MI	Minor CIS & MI	Totals
2009-2010	8	1	2	1	12
2010- 2011	6	3	1	2	12
2011-2012	8	2	2	1	13
2012-2013	6	4	4	3	17
2013-2014	1	2	2	0	5*

* This number omits 5 students (from CISB 471) who lacked general education requirements to graduate in Spring 2014 and expect to complete these requirements in Fall 2014.

E. One-year retention rates and four-and six-year graduation rates

CIS retention rates, 4-year and six-year graduation rates follow in Tables 3.5, 3.6 and 3.7 shown below. When reviewing Tables 3.5, 3.6 and 3.7, the following three points are pertinent:

➢ Due to the smaller numbers, one student can move the percentage dramatically, moving from 0% to 100% in a single year
➢ Students who enter the BAS as juniors account for one-half of the students and did come in as freshman and are not reflected in the numbers
➢ Many CIS majors are on the job part-time and may not complete in 4 to 6-years
➢ Due to the shortage of CIS professionals and subsequent high salaries, some students will choose employment over graduation.

Table 3.5
Retained to Second Fall

Retained to Second Fall				
Entry Fall	Freshmen CIS Majors*	Retained in CIS	Retained other major	Not retained	% Retained in CIS
2008	7	4	1	2	57%
2009	3	2	1	0	67%
2010	5	2	1	2	40%
2011	3	0	1	2	0%
2012	4	3	1	0	75%

Table 3.6
Graduated in 4 Years

Graduated in 4 years				
	Freshmen CIS Majors	Graduated in CIS	Graduated other major	Did not Graduate	% Graduated in CIS
2008	7	0	1	6	0%
2009	3	1	0	2	33%
2010	5	0	0	5	0%

Table 3.7
Graduated in 6 Years

Graduated in 6 years				
	Freshmen CIS Majors	Graduated in CIS	Graduated other major	Did not Graduate	% Graduated in CIS
2008	7	0	2	5	0%

F. Student successes/recognitions, especially in external student competitions

The Computer Information Systems students at Colorado Mesa University have had many successes over the past six years. These successes range from competing (and winning) in the Association of Information Technology's (AITP) National Collegiate Conference (NCC) competitions, presenting reviewed papers at conferences (and earning best in track awards) and presenting scholarship endeavors at the CMU Student Showcase event. These endeavors, along with the results are presented in Tables 3.5-3.8. In addition to individual student successes, there have been collaborative efforts in the department to engage students in scholarship beyond the classroom. These are summarized in Table 3.8.

Table 3.5
Student successes at the AITP's NCC

Student	Year	Event	Result
Dustin DeLor	2014	PC Troubleshooting	3rd Place
Michael Rowe	2014	PC Troubleshooting	Honorable Mention
Dustin DeLor	2013	PC Troubleshooting	3rd Place
Paul Ducray	2013	PC Troubleshooting	Honorable Mention
Steven Nolan and Heather Flaherty	2012	Business Analytics	Honorable Mention
Triston Arisawa and Megan Vogel	2011	Web Design	Honorable Mention
Megan Vogel	2011	Student Paper	1st Place
Josh Major and Cole Nash	2011	Network Design	Honorable Mention
Cole Nash	2011	Student Paper	3rd Place
Lyndsay Yerbic	2010	Student Paper	Honorable Mention
Ed Cart	2010	Student Paper	Honorable Mention
Amanda Nesbit	2009	Student Paper	Top Ten Placement
Bill Jackson and Loren Gabriel	2008	Web Design	2nd Place
Charles Smith	2008	Student Paper*	Top Ten Placement

* Paper published in Volume 3, number 3 of *The Journal of Technology Management and Innovation*, 2008

Table 3.6
Student successes at conferences

Student	Year	Conference	Result
Steven Nolan	2011	Mountain Plains Management Conference	Best Paper Award
Eve Edie	2010	Mountain Plains Management Conference	Paper Accepted
Jon Williams	2010	Mountain Plains Management Conference	Best Paper Award

Table 3.7
Student success at CMU's Student Showcase

Student	Year	Result
Heidi Gruber	2014	Best in Track
Ruth Schramm	2014	Best in Track
Sydney Jensen	2012	Best in Track
Megan Vogel	2011	Best in Track

Table 3.8
Student scholarship beyond the classroom

Student	Scholarship
Emily Nunn, Ryan Zentmeyer	Salvaged an Access database for a community nonprofit organization, GJ Catholic Outreach, 2014
Cole Nash	Snyder, J., Carpenter, D., Slauson, G., Skinner, J. and **Nash, C.** (2012). Beyond the Bake Sale: Fundraising and Professional Experience for Students Involved in an Information Systems Student Chapter. *Information Systems Education Journal*, 10(6), p. 72-83.
Bill Jackson and Telicia Chaffin	"Using the National Collegiate Conference as a Student Chapter Focal Point" AITP National Collegiate Conference, 2008 **(Invited presentation including student presenters)**

G. Other information

Student demand for the CIS major has stayed constant over the review period. This parallels the national trend of low student enrollment in Information Systems disciplines and in general, STEM disciplines in general. The students that are in the program have an interest in participating in the student chapter of the AITP as well as competing at the National Collegiate Conference of the AITP. Living on the Western Slope of Colorado, in an area not known for technology companies, forces the CIS students to reach out to the parent chapter (the Mile High Chapter in Denver) of our student chapter of the AITP. These interactions occur once or twice per year and involve a trip to Denver to take part in the monthly meeting of the parent chapter. At these meetings, the students interact with IT/IS professionals working in Denver, listen to presentations by speakers, and network with other student chapter members from the Denver and South Dakota areas. These trips generally include a tour of a local business or governmental facility that uses IT/IS at a high level. At the spring meeting, the chapter advisor and students who attend the NCC give an invited presentation that discusses their experience at the NCC.

Overall, enrollment in CIS classes has been growing over the past 5-7 years. This growth is due, partly, to service classes the CIS faculty offer to the business department, CISB 101, Business Information Technology, CISB 210, Fundamentals of Information Systems, CISB 241, Introduction to Business Analysis, and CISB 341, Quantitative Decision Making.

4. **Program Resources: A narrative describing trends related to the following data.**
   A. **Faculty**
      1) **Ratio of full-time equivalent students (FTES) to full-time equivalent faculty (FTEF)**

Table 4.1 shows the ratios of full-time equivalent students to full-time equivalent faculty. The numbers have more than doubled for the number of FTES, and the ratio of student to faculty has increased each academic year during this program review period.

Table 4.1
Ratio Information for FTES to FTEF

Year	FTES	FTEF	FTES:FTEF
2009-2010	**64.8**	**4.5**	**14.4**
2010-2011	**86.4**	**5.5**	**15.7**
2011-2012	**100.2**	**6.3**	**15.9**
2012-2013	**112.2**	**6.9**	**16.2**
2013-2014	**135.3**	**7.7**	**17.5**

   2) **Course credit hours and student credit hours by faculty type (i.e. tenured/tenure-track, instructor, administrators/staff/coaches, lecturers);**
      This information is given in Table 4.2

Table 4.2
Course Credit Hours and Student Credit Hours by Faculty Type

Subject	Faculty Type	2009-10			2010-11			2011-12			2012-13			2013-14		
		CCH	SCH	%SCH	CCH	SCH	%SCH	CCH	SCH	%SCH	CCH	SCH	%SCH	CCH	SCH	%SCH
CIS	1-T/TT	78	1332	69%	87	1526	59%	88	1488	50%	100	1795	53%	83	1433	35%
	3-FT NonTT	3	69	4%	6	168	6%	6	162	5%	3	69	2%			
	5-Admin Coaches				3	24	1%	6	138	5%	9	204	6%	18	396	10%
	6-PT	27	543	28%	36	873	34%	51	1218	41%	54	1299	39%	84	2229	55%
CIS Total		108	1944	100%	132	2591	100%	151	3006	100%	166	3367	100%	185	4058	100%

The increasing percentage of CIS courses being taught by part-time faculty has a potential impact on recruiting majors into the discipline.

3) **Faculty successes/quality/recognitions – details related to teaching, advising, scholarship, service and other achievements**

Computer Information Systems Faculty Accomplishments since 2007

Dr. Donald Carpenter, Professor
Advising:
- Advised 2 MBA student practica in 2007-08; 10 in 2013-14; 15 in 2014-15
- Advised 7 students on papers submitted to Mountain Plains Management Association in 2009
- Advised several students on work presented at annual CMU Student Showcase

Scholarship (only peer reviewed listed):
- 6 invited book chapters
- 14 journal articles (plus 3 under review)
- 36 conference papers, abstracts, workshops, panels (plus 2 under review)
- Best paper award at 2010 IBER Conference (co-author)
- Best paper award in pedagogy track at 2007 MPMC (co-author)

Service:
- Continuously a member of Undergraduate Curriculum Committee and past Chair
- 4th year as Chair of Graduate Curriculum Committee
- Coordinates CISB 101 lecturers

Teaching and Other:
- CMU VPAA's Professional Development Award for 2012
- Sep 2010, first recipient of Associated Student Government's monthly faculty parking pass
- Nominated for distinguished faculty award for 2009
- May 2008, Associate Student Government and Chamber of Commerce Outstanding Educator
- May 2008: granted tenure and promoted to professor (the 2nd university for these awards)
- Excellent rating on annual performance evaluation for 2007-2010, 2012
- Exemplary rating of annual performance evaluation for 2011, 2013

Mr. David Pumphrey, Assistant Professor
Hired in January of 2014
- 23 years industry experience in Information Systems in the following areas:
  - Programming
  - Systems Analysis & Design
  - Agile Software Development
    - Certified Scrum Master in 2009
  - Enterprise Architecture
  - Project Management
  - Executive I.T. Management
- Doctoral program from 2010 to 2014. Completion: October 2014

Mrs. Gayla Jo Slauson, Associate Professor

Advising:

- Advised often in campus orientation events, major fairs and welcome back events
- Spoke with fifty potential students from Cedaredge regarding programs at CMU, April 2014
- Guest presentations in high schools
- Advised ten students on database projects presented at annual CMU Student Showcase
- Over 50 assigned advisees

Scholarship:

- 9 journal articles
- 17 conference papers, abstracts, workshops, panels (plus 2 under review)
- Distinguished paper award at 2013 ISECON Conference (co-author)
- Session Chair at CONISAR Conference
- Presentation at Higher Learning Commission conference in Chicago, 2014
- Provided workshop in Meru, Kenya, Africa for prospective entrepreneurs, 2009

Service:

- Faculty Trustee (elected to position) to Colorado Mesa University Board of Trustees 2013-15
- HLC Steering Committee and Criterion Two Chair for accreditation visit in 2013
- Faculty Senate Member and Chair 2009-2010
- Community service – Strong Schools Strong Community board member, hosted forum for local school board candidates 2013
- Outstanding Faculty Service Award CMU, 2001

Teaching:

- Taught 24 different courses for Colorado Mesa University in the Department of Business
- Excellent ratings in teaching every year
- Teaching awards from earlier years (Wall of Fame, Outstanding Educator, National Future Business Teacher Award)
  Other
- Exemplary rating of annual performance evaluation 2012 and 2013

Dr. Johnny Snyder, Professor

Advising:

- Advised over 30 students in preparation for conferences and competitions with
    - 22 national awards returned to CMU
    - 8 conference presentations/proceedings publications
    - 4 best in track awards from conferences
    - 1 journal publication
    - Advises over 50 CIS majors per year

Scholarship:

- 13 peer reviewed journal publications
- 2 best in track awards

- 1 distinguished paper award
- 23 conference papers/proceedings publications
- Reviewer for journals and conferences
  - Journal of Information Systems Education
  - Information Systems Education Journal
  - Information Systems Educators Conference
  - Four Corners Conference on Globalization
  - Mountain Plains Management Conference
- 12 conference/meeting presentations (6 with students as co-presenters)
- 5 certifications, 3 in Six Sigma, 2 with Microsoft

Service:
- Served on Executive Councils and Board of Directors
- National Level Leadership Council for AITP
- Faculty Senator (Vice President for 2 years)
- Faculty Advisor for AITP student chapter for 9 years
- Guest presentations in local area schools
- HLC re-accreditation committee member
- Multiple other departmental and university committee involvement

Teaching:
- Teach 14 different classes for CMU
- Incorporate out-of-class learning experiences for student club (AITP)
  Other:
- Faculty "Extra Mile Award" Association of Information Technology Professionals
  Awarded at the National Collegiate Conference, March, 2008
- Outstanding Educator Award, Presented by the Grand Junction Chamber of Commerce and the Student Government Association of Mesa State College, May, 2008
- CMU's VPAA faculty development award, 2007 and 2009
- Who's Who in American Education, 2007, 2008
- Nominated for Distinguished Faculty Award 2013-2014

4) Faculty curricula vitae included in Appendix A
Curricula vitae for each of the CIS faculty are included in Appendix A

B. Financial Information (finance and budget): Describe any significant increases or decreased in the unit cost of the program during the review period, noting factors that may be affecting costs and the possibility of correcting any deviation within existing resources.

1) Total budget revenues and program expenditures
The budget for the CIS program is contained within the Accounting and CIS budget spreadsheets. The CIS faculty have harvested out 50% of the related expenditures representing the fact that CIS is approximately half of the faculty count for Accounting and CIS. This information is in Table 4.3.

Table 4.3

CIS Expenditures

ORG CODE	ACCT, CODE	ACCT TITLE	FISCAL YEAR 2009		FISCAL YEAR 2010		FISCAL YEAR 2011		FISCAL YEAR 2012		FISCAL YEAR 2013		FISCAL YEAR 2014	
	Org 1120 - Computer Information SystemsAccounting		ORIGINAL BUDGET	YTD ACTUAL	ORIGINAL BUDGET	YTD ACTUAL	ORIGINAL BUDGET	YTD ACTUAL	ORIGINAL BUDGET	YTD ACTUAL	ORIGINAL BUDGET	YTD ACTUAL	ORIGINAL BUDGET	YTD ACTUAL
1120	5146	SPS FICA-MEDICARE CONTRIBUTION	0	0	0	0	0	14	0	0	0	0	0	0
1120	5166	SPS PERA	0	0	0	0	0	73	0	0	0	0	0	0
1120	5168	SPS PERA - AED	0	0	0	0	0	23	0	0	0	0	0	0
1120	5169	SPS PERA - SAED	0	0	0	0	0	16	0	0	0	0	0	0
1120	5256	CN REGULAR FT WAGES	257120	238196	248791	251546	256859	258816	263354	275623	288377	298896	339351	313792
1120	5296	CN TEMPORARY PT WAGES	16831	5050	16200	900	16200	7254	20000	23789	23775	29425	23775	48725
1120	5386	CN ANNUAL LEAVE PAYMENTS	0	1713	0	936	0	135	0	521	0	1241	0	964
1120	5416	CN DCPP TIAA CREF	0	15140	0	15181	0	15560	0	16881	0	20720	0	24038
1120	5426	CN DCPP FIDELITY	0	3386	0	3437	0	3757	0	3860	0	4271	0	6058
1120	5436	CN DCPP VALIC	0	0	0	0	0	0	0	0	0	3343	0	0
1120	5446	CN FICA-MEDICARE CONTRIBUTION	0	2809	0	2902	0	3111	0	3512	0	4567	0	5069
1120	5456	CN OTHER RETIREMENT PLAN	0	0	0	0	0	0	0	0	0	0	30120	0
1120	5466	CN PERA	32421	7052	30968	7193	34283	6077	36532	7371	40137	5959	17261	7974
1120	5468	CN PERA - AED	0	1128	0	1471	0	1931	0	2682	0	1930	0	2814
1120	5469	CN PERA - SAED	0	542	0	935	0	1421	0	2158	0	1665	0	2536
1120	5506	CN DENTAL INSURANCE	0	2244	0	2436	0	2343	0	2233	0	2405	0	2196
1120	5516	CN HEALTH INSURANCE	34459	21144	34189	23390	33256	24755	38073	27695	45631	34403	56545	36207
1120	5526	CN LIFE INSURANCE	0	963	0	1032	0	1045	0	1123	0	1166	0	1078
1120	5536	CN DISABILITY	0	635	0	669	0	647	0	647	0	728	0	708
1120	6150	EMPLOYEE TRAVEL - IN STATE	2400	255	2100	361	2100	507	2100	161	2400	843	2700	0
1120	6155	STUDENT TRAVEL - IN STATE	0	72	0	0	0	0	0	875	0	0	0	0
1120	6160	EMPLOYEE TRAVEL - OUT OF STATE	0	699	0	570	0	870	5200	2635	0	413	0	1010
1120	6201	SUPPLIES	5787	3228	5200	4149	5200	3038	0	20	5200	4469	5200	1538

1120	6211	SOFTWARE	0	218	0	278	0	157	0	24	0	111	0	408
1120	6215	SOFTWARE - ACADEMIC	0	621	0	0	0	0	0	0	0	0	0	621
1120	6350	PERSONNEL RECRUITING - IN STATE	0	0	0	0	0	0	0	0	0	0	0	416
1120	6360	PERSONNEL RECRUITING - OUT OF STATE	0	0	0	0	0	0	0	0	0	196	0	229
1120	6401	TELEPHONE CALLS	242	8	5	4	5	8	5	21	5	15	5	18
1120	6410	TELEPHONE EQUIPMENT	2250	1568	3168	1584	3168	1584	1684	1551	1684	1386	1684	1584
1120	6430	POSTAGE	0	23	0	31	0	30	0	83	0	47	0	16
1120	6480	ADVERTISING	0	140	0	0	0	317	0	48	0	204	0	0
1120	6481	ADVERTISING - SEARCHES	0	0	0	0	0	0	0	597	0	480	0	269
1120	6501	EQUIPMENT REPAIR & MAINTENANCE	0	0	0	0	0	0	0	0	0	50	0	0
1120	6760	RENT/LEASE EQUIPMENT	2000	934	2000	746	2000	746	2000	468	2000	1216	2000	1109
1120	8100	EQUIPMENT NON-CAPITAL	0	921	0	1478	0	71	0	0	0	0	0	0
1120	8101	COMPUTER EQUIPMENT NON-CAPITAL	0	339	0	0	0	0	0	0	0	1078	0	0
		TOTAL EXPENDITURES	353509	309026	342621	321230	353070	334305	368948	374575	409209	421227	478640	459377

2) Ratio of total expenditures/student credit hours

The ratio of expenditures to student credit hours is given in Table 4.4

Table 4.4

Ratio of total expenditures to student credit hours

Year	2009	2010	2011	2012	2013
Ratio of Expenditures to Student Credit Hours	158.9641	123.9792	111.2127	111.249	104.3415

The data given for expenditures is for the fiscal year, while the data for the student credit hours is given for the academic year. However, the trend is evident, that the ratio is decreasing, indicating efficiency in the department.

3) External funding the program or its faculty have submitted and received since last review. Also what potential opportunities exist for obtaining external funds during the next six years?

Currently the program has no external funding sources. Faculty in the program are interested in pursuing external funding, but continue to have time constraints that inhibit this activity.

C. Library Assessment

Date of Assessment: September 5, 2014

Purpose of Assessment: Program Review

Program under review: Computer Information Systems

Program Level: Bachelor of Science

Liaison: James Dildine

Collection Assessment: The following is an assessment of resources available at Tomlinson Library which support the CMU Computer Information Systems program. The Library of Congress subject headings* used for this analysis were selected from catalog records of materials associated with "Computer Information Systems." Subject headings include: *Business – Communication Systems; Business – Databases; Business and Economics – Communication Systems; Business and Economics – Management Science; Business and Economics – Organizational Behavior; Business Programming; Computers - Database Management; Computer Science; Computer Science – Congresses; Computers – Data Processing; Computers – System Administration; Information Storage and Retrieval; Information Technology; Information Technology – United States - Management; Knowledge Management; Management Information Systems; Management Information Systems – Congresses; Management Information Systems– United States; System Analysis; System Design*

(*For a detailed subject-by-subject analysis contact library liaison.)

1. Library resources:

a. Reference Support: The following titles are representative of materials related to *computer information systems* held in the library reference area:

- *Milestones in Computer Science and Information Technology, 2003*
- *Dictionary of Computer Science, Engineering, and Technology, 2001*
- *The Java Class Libraries, 1997*
- *The C and UNIX Dictionary: From an Absolute Pathname to Zombie, 1998*
- *Peterson's Graduate Programs in Business, Education, Health, Information Studies, Law & Social Work, 2013*
- *The Encyclopedia of Library and Information Science, 2003*

b. Monographic Resources: There were a total of (242) monographic resources identified from a search using Library of Congress subject heading (outlined above). The majority of these materials were in paper format (225); while (17) are in electronic format. The following table shows the item count by publication year:

2000 – 2014:	97
1990 – 1999:	113
1980 – 1989:	24
Before 1980:	8

An *age analysis* of monographic collections (regarding *computer information systems* at Tomlinson Library):

titles published since 2000	40%
titles published 1990 – 1999	47%
titles published prior to 1990	13%

c. Periodicals: A subject search of periodicals from the Library's homepage indicates full-text availability (print or online) for (116) periodical titles related to *Computer Information Systems*.

d. Electronic Resources: The following online subscription indexes and databases provide coverage for this concentration:

- *Academic Search Complete*
- *Business Source Complete* – BSC provides full-text to over 2,300 journals including access to over 1,100 peer-review journals.
- *JSTOR* – provides access to full-text, peer-reviewed articles in the sciences, including access to ebooks and journals in both business and information management.
- *LexisNexis* – provides access to full-text articles from newspapers and industry trade journals as well as company and industry directories and profiles.
- *OmniFile Select* - The *Applied Science and Technology* section provides support materials for this program.

As an example of the volume of resources available to library patrons, a subject search of *all* materials in Academic Search Complete--including inter-library loan—shows availability of

(68,430) items related to *Computer Information Systems*. Using the search terms *Computer Science* produces the following data:

Computer Information Systems - *All* resources	68,430
Full-text resources	49,545
Available in Library: full-text and peer-reviewed	37,337

2. Evaluation of the total collection:
a. Strengths: The library's electronic databases encompass a wide range of Computer Information Systems materials.
b. Weaknesses: Monographic materials are somewhat limited and out of date.
3. Recommendations: Continue to add electronic databases and update reference and other monographic materials.

Library Director: ___Sylvia L. Rael_____ Date: __10/20/14__

D. Physical Facilities

The department of business is housed in the second and third floors of Dominguez Hall (DH) opened in 2008 on the Colorado Mesa University campus. In DH there are three computer classrooms used for instruction of CIS classes (DH203, DH204, DH304) and one dedicated computer classroom (DH303) for the upper division CIS courses. DH 203 and 204 each have 25 computer stations. In summer 2014, the computer stations in DH 304 were increased from 27 to 30 and the computer stations in DH 303 were increased from 15 to 20. Students who are taking upper-division CIS classes in DH 303 also have key card access to the room due to the presence of specialty software on the computers, and the need for a meeting place for team projects.

All CIS faculty have office space in DH as well as a computer on their desktops. The network access afforded faculty and students includes Internet and library access. The library not only has hard copies of journals and books, but also subscribes to multiple databases in support of the academic mission.

Most of the computer stations in DH 303 and 304 and all the faculty offices in DH 301 are wired both to the campus network and to the CIS server room, DH 302. The servers in DH 302 previously housed Linux and other software that is now available to download free to students' laptop computers. Therefore, new applications are planned for those network connections and the servers in DH 302. One of the potential uses spring 2015 will be CISB 315 students learning to install and connect networks. Other future possibilities include training in computer security and in managing enterprise software applications.

E. Instructional Technology and Equipment

All teaching labs contain smart classroom technology with an instructor station capable of projection, access to CMU network drives, the Internet, and specialty software as needed for the classes. The CMU Information Technology department keeps the network operating system and application software up-to-date as requested by the CIS faculty on a semester to semester basis.

F. Efficiencies in the Way the Program is Operated

One way the program operates efficiently is through packaging courses so that one course can serve effectively in multiple programs rather than only being relevant in one. Another efficiency has been achieved through allowing students to take certain courses in other departments such as Math and Computer Science to count for some prerequisites to CIS courses. Another efficiency within the program is the Academic Alliance with Microsoft allowing students to get the newest software needed for their classes and for general use and experimentation inexpensively.

Another efficiency in working with adjunct faculty in the teaching of introductory software skills is achieved by using software provided through the book publisher that assists in consistent and coherent presentation of material and grading of tests and assignments using common productivity tools to insure course comparability.

Faculty in the CIS program are often efficient scholars as well, collaborating on papers so that one can travel to a conference and present rather than several going to one conference.

5. **Student Learning Outcomes and Assessments**
   A. **Program SLOs (Student Learning Outcomes) and how they relate to the Program's Mission Statement and Courses. Curriculum map to be located in Appendix B. Also description of how the program contributes to the achievement of the institution-wide student learning outcomes as applicable.**

For AY 2007-2012, the Computer Information Systems program had a refined set of six Student Learning Outcomes that were tied to the CMU institutional mission and the program's mission. Spring 2012, CMU adopted a set of SLOs for all baccalaureate degrees, the Department of Business adopted a set of departmental SLOs tied to the institution's SLOs, and the CIS faculty adopted a new set of SLOs tied to the departmental SLOs. However, creation and use of means to assess the new sets of SLOs is still a work-in-progress. Unwilling to suspend its program assessment in the interim, the CIS faculty chose to continue to assess its programs in AY 2012-14 using its well-established assessment processes.

Consequently, the student learning outcomes used by the CIS faculty for the period of this program review, AY 2007-2014 are:

1. Graduates will demonstrate mastery in systems theory and concepts, information technology tools, systems analysis, design and development methodologies and problem solving as applied to computer hardware, software, and networks appropriate for the bachelor's degree level.
2. Graduates will demonstrate knowledge in economics and business functions (such as accounting, business law, finance, management, marketing, and quantitative methods) as applied locally, nationally, and globally, appropriate for the bachelor's degree level.
3. Graduates will demonstrate proficiency at general and technical writing and oral communication skills appropriate for the bachelor's degree level.
4. Graduates will demonstrate proficiency at critical and analytical skills appropriate for the bachelor's degree level.
5. Graduates will demonstrate proficiency at teamwork and project management skills appropriate for the bachelor's degree level.
6. Graduates will demonstrate behaviors consistent with professionalism expected within the information systems industry.

These six SLOs relate directly to the CIS program mission that "all graduates at the baccalaureate level will have developed a depth of understanding in their major field, in business supporting fields, in critical and analytical skills, and in written and oral communications appropriate to their major field."

In the absence of institutional SLOs, the CIS SLOs related directly to the institutional mission: "The principal focus of our college's curricular program is undergraduate education in the liberal arts and sciences and a limited number of professional, technical, and graduate programs."

A curriculum map, showing how CIS courses map to the IS 2002 Model Curriculum is given in Appendix B. The CIS Assessment Report for AY 2007-2014 is included in Appendix C.

B. Direct and Indirect Measurements that Assess the Program's Student Learning Outcomes. (What does the assessment information indicate about how effective the program is in preparing students for the future? Other Documentation of Program Quality, including External Validation. (Assessment results summarized in tabular form with narrative that describes findings. Information on student satisfaction as well as current student and alumni success should be included like graduate employment, awards, pass rates on licensure, advanced degrees obtained, results of alumni and employer surveys.

The CIS faculty utilized one to five measurements to assess each of its six SLO's; 16 means total. Only three SLOs were required in the previous CMU assessment system and only two assessment means were required for those three SLOs. Each measurement need not be taken each year. The means and result of assessment for AY 2007-2104 are presented in Table 5.1. The same data is given in more detail in the CIS Assessment Report for AY 2007-2014 in Appendix C. Results of the alumni survey are included in Appendix D.

Table 5.1 shows that there were no data or not enough data collected to measure seven of 16 means to assess six SLOs of the CIS program. For eight of the other nine means, the CIS programs exceeded the standards set for five of its SLOs. Only for one SLO indicated did the CIS program not achieve the standard. This indicates the CIS program is successful in preparing its students.

Most noteworthy is the pass rate of seniors on the Information Systems Analyst Certification exam. The exam used in springs 2008-2014 is aligned with the IS 2002 Model Curriculum, with which CMU's CIS programs are aligned. Of the 57 CMU CIS seniors who took the ISA certification exam, 46 (80.7%) qualified at the ISA-Practitioner level and two (3.5%) qualified at the ISA-Mastery level. The 84.2% overall pass rate in 2008-14 surpasses CMU CIS program's 72% pass rate in 2003-07. According to the ICCP web site "companies use [ISA certification] to evaluate incoming employees to verify skills and competencies" required of information systems analysts, thus increasing the employability of our graduates.

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Table 5.1

Assessment Data

Means	Data Collected	Standard	Results
SLO 1. Information systems knowledge.			
1a. ICCP ISA exam	2008-14 (57 seniors)	50th percent	57th percent *
1b. Capstone survey	2008 (4 seniors)	80% feel prepared	75% feel prepared **
1c. Capstone project	All springs 2008-14	80% pass rate	100% pass rate *
1d. Alumni survey	Summer 2014 (9 alumni)	>50% feel prepared	44% feel prepared **
1e. ISA exam details	Spring 2012	>50% on >50% of IS 2002 learning units	>50% on 52% of IS 2002 learning units *
SLO 2. General business knowledge.			
2a. MFT exam (biz)	2008-14 (57 seniors)	>50th percentile	69.3% *
2b. Capstone survey	2008 (4 seniors)	80% feel prepared	75% feel prepared **
2c. Alumni survey	Summer 2014 (9 alumni)	>50% feel prepared	No questions asked
SLO 3. Technical writing & oral communications.			
3a. Capstone project	All springs 2008-14	80% pass rate	100% pass rate *
3b. Capstone survey	2008 (4 seniors)	80% feel prepared	75% feel prepared **
3c. Alumni survey	Summer 2014 (9 alumni)	>50% feel prepared	100% feel prepared *
SLO 4. Critical & analytical skills			
4a. MFT exam (quant)	2008-14 (57 seniors)	>50th percentile	No data reported.
4b. Capstone survey	2009 (4 seniors)	80% feel prepared	75% feel prepared **
4c. Alumni survey	Summer 2014 (9 alumni)	>50% feel prepared	100% feel prepared *
SLO 5. Teamwork and project management.			
5a. Capstone project	All springs 2008-14	70% pass rate	100% pass rate *
SLO 6. Professionalism.			
6a. AITP affiliation	Anecdotal 2008-14	>50% participation	<50% participation

*= exceeded standard. **=results are below standard but too few data collected to determine

C. Program Improvements resulting from Assessment of SLOs since the last program review.

The CIS faculty have used the annual results of its assessment process to improve the program. Specifically, the annual results have been the outcome of the ISA Certification exam and the MFT exam, and the outcomes of the team projects and presentations in the CISB 471 capstone course. Improvements to the program based on the IS 2002 Model Curriculum have been continuous and have included curriculum changes to improve the program based on a national curriculum model, and changes in multiple classes based on student course evaluations. For example, when student scores on the ISA exam were lower than the CIS faculty preferred in the subject of computer programming, the faculty added more modern programming languages (php, CSS, XHTML, MySQL) to CISB 331 and CISB 471.

The surveying of graduates was conducted by the campus institutional research office. The survey was mailed to students who graduated in the program review period rather than to all CIS

alumni, and only 42 of the 57 known CIS graduates in 2007-14 were included. Disappointing is that only nine alumni completed a survey. The CIS faculty have some anecdotal evidence as to the success of its graduates and have used it to improve the CIS programs. Having additional feedback from alumni would provide information to improve the CIS programs.

D. Refining of SLOs, modifications of data collection if applicable, and other information related to learning outcomes assessment.

As explained briefly in section 5A above, all departments and programs at CMU are in the process of revising their program assessment processes. The Department of Business new SLOs are "A CMU Department of Business graduate will be able to:

- Apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations (critical thinking skills).
- Produce professional work products, independently and collaboratively (individual and team skills).
- Communicate clearly, appropriately, and persuasively to the audience, both orally and in writing (communications skills).
- Integrate knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies (general business knowledge).
- Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions (analytical skills).
- Properly and appropriately apply information to strategic decision making across functional business areas (strategic information systems knowledge).

To align with the departmental SLOs, the CIS faculty have adopted the following CIS program SLOs:

- Apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations (critical thinking skills).
- Produce professional work products, independently and collaboratively (individual and team skills).
- Communicate clearly, appropriately, and persuasively to the audience, both orally and in writing (communications skills).
- Integrate knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies (general business knowledge).
- Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions (analytical skills).
- Properly and appropriately apply information to strategic decision making across functional business areas (strategic information systems knowledge).

- Identify, formulate, and solve information systems related problems by applying knowledge of information systems practices (specialized knowledge in information systems).

The map of CIS courses within CIS programs that address those SLOs is located in Appendix E. The CIS Assessment Plan is in Appendix F. Assessment of most of the SLOs will be done in a department-wide manner in courses that the CIS programs share with the Bachelor of Business Administration (BBA) program, which is the department's flagship program.

The exception is the CIS program SLO pertaining to specialized information systems knowledge. The ICCP's ISA Certification exam and CISB 471 Capstone project and presentation will continue to play important roles in the assessment of that SLO. Not only will those assessments effectively assess the SLO at the advanced level, they will also provide the CIS faculty with valuable longitudinal data. Whereas most departments at CMU are only beginning to measure this or similar SLOs, the CIS faculty have been measuring SLOs related to specialized information systems knowledge since 2003.

6. Future Program Plans
A. Vision for Program

Computer Information Systems (CIS) faculty at Colorado Mesa University will prepare Western Colorado's students to become leaders in integrating human, technological, and organizational systems. CIS faculty, in collaboration with the Western Slope business community, students and graduates, will lead our region in finding state-of-the-art solutions to their business computing and information systems' needs.

The future of the CIS program could be classified as "excitingly unknown" due to the pace of technology evolution. As many in the educational industry would attest, we are training our students for jobs that are yet to exist - a powerful statement indicating a daunting task. The future of the CIS discipline is promising (according to the Bureau of Labor Statistics) as job prospects continue to grow.

B. Strengths and Challenges

Strengths

The department has many strengths, primarily in its faculty. This is evidenced by the updating of the curriculum in a timely manner to keep the department in-line with national trends, and the involvement of the CIS faculty in scholarship and service activities appropriate to the discipline. Evidentiary statements can be found in sections 3. F. Student successes and 4. A. Faculty Successes.

The CIS faculty, in moving the program forward, constantly keep abreast of new technologies and changing trends in the technology ecosystem. One way this is accomplished is by moving from the IS 2002 curriculum model into the IS 2010 curriculum model as the faculty must update their skill sets. The CIS faculty also keep current in the CIS disciplines through participation in conferences such as ISECON, CONISAR, and NCC, by reading many specialized publications, and via literature reviews. The CIS faculty also publish journal articles and conference papers annually dealing with both research and pedagogical issues. This currency enables CIS faculty to improve existing courses and to add new topics into the discipline. These curriculum updates are necessary in order to graduate students who are ready to enter the workforce with the fundamental skills of an information systems worker.

Many companies start their new hires in a support role (help desk, user support) while these hires gain an appreciation for where technology is deployed across the company. After a year or two, the hire then moves into a department where more specialized skills are needed (network group, web group, database group). Incorporated into these moves are education, training, and hands-on experience with the technology germane to the group. Thus, one of the critical roles of the CIS faculty continues to be to instill an obligation for continuous learning in the student, as this will be one constant throughout careers in information systems.

Keeping faculty skills updated is paramount to success in an information systems program. New technologies such as Hadoop (a database system for large data sets), evolving Ethernet

technologies for networking, and real-time data analysis keep faculty busy updating skill sets to introduce these concepts, hardware, and techniques to the students. Recently, the Business Department acquired a SAP license (enterprise software) in order for the students (all business students and CIS students) to gain experience and exposure to tools they will see in the corporate world. A SAP distribution contains the enterprise database upon which all departments rely to accomplish business tasks, processes, and procedures. This type of exposure is critical to the 21st century business student, as much of the decision making process in corporate America is tied to data, data streams, and analytic techniques of data.

The CIS faculty attempt to keep their skills updated through web-based training, conference attendance, and individual scholarly pursuits. A critical success factor for these endeavors is the availability of financial support from CMU in order to attend conferences and their associated workshops, to pay for web-based training, and to attend SAP workshops (while attendance is free, travel and lodging is not).

Through the student chapter of the Association of Information Technology Professionals, contacts in the business community and contacts with alumni of the program are facilitated. This facilitation takes the form of guest speakers in monthly meetings, and tours of local IT/IS shops to illustrate what the students will be doing upon graduation.

An extraordinary strength of the CIS program is its position in regard to the Department of Business. Only the MANG prefix has more courses than CISB in the BBA program. The service classes for the BBA include CISB 101, Business Information Technology; CISB 210, Fundamentals of Information Systems; CISB 241, Introduction to Business Analysis; and CISB 341, Quantitative Decision Making. These reflect the growing appreciation by the Business faculty for the need to introduce the business students to computing and data analysis in the business environment which are necessary skills in the information age. This position has been strongly advocated by the CIS faculty and the Business faculty have listened.

This advocacy has also resulted in the Department of Business adopting a department-wide student learning outcome (SLO) related to strategic application of information. Assessment processes for that SLO are being developed by the CIS faculty. CISB 210 will be the beginning course for this SLO. There are likely to be future courses for the developing level of this SLO. Business faculty in all business disciplines are now considering how to measure this SLO at the advanced level within their capstone courses.

CIS faculty are heavily involved in campus affairs. Positioned as Faculty Trustee, Faculty Senate Vice-President, and Undergraduate and Graduate Curriculum Committees, the CIS faculty are known for their insight and wisdom. The CIS faculty are excited to assist in the development of the new campus-wide SLO in information literacy.

The IT support at CMU is outstanding, with labs up-and-running at the beginning of each semester, and help tickets responded to quickly. The demand for CISB courses at the 100 and 200 levels is outstanding, and the employment outlook for the discipline is great.

Challenges

The challenges for the CIS program include recruiting of students into the program, and continuation of scholarship and conference attendance due to scholarship and travel fund constraints. Recruiting is primarily handled by the admissions office for students to enter CMU, while program recruiting is handled by the faculty in the lower division classroom. Due to the overwhelming number of adjunct faculty teaching the lower division CISB courses (CISB 101, CISB 210), full-time faculty do not have the chance to evaluate the freshman and sophomore classes for potential majors. Since CISB 210 is the first "real" CIS course in the BBA program, it provides a great opportunity to recruit partially-undecided BBA majors into CIS programs. It is therefore critical that CISB 210 be staffed exclusively by those with extensive CIS knowledge, rather than typical adjunct faculty. Additional tenured and tenure track faculty would help.

In the previous paragraph, "partially-decided BBA majors" relates to the fact that the IS concentration in the BBA is 30 credit hours. Most concentrations are 15 credit hours, allowing BBA students to choose to select two concentrations. As sophomores, most BBA students in CISB 210 have already chosen their primary concentration. A 30 credit hour IS concentration is not attractive. One approach the CIS faculty will take is to modernize and emphasize the 15 credit hour Managerial Informatics concentration. Another approach to consider is to create a 15 credit hour Management Information Systems concentration that would augment the most popular concentration which is Management. Another area of potential focus is the business and marketing analytics than can occur through the social media of today. CIS faculty are well-positioned to provide support and valuable expertise as these areas unfold.

Pursuing scholarship at CMU is a worthy endeavor, but exchanging it with other faculty members and industry professionals at a national level is a necessity. The exchange of ideas and issues with other faculty from similar disciplines is a growth potential (for the faculty member as well as the program and the institution) that is not being fully exploited at CMU. With a scholarship/travel budget of $600 per faculty member, travel to conferences (including the National Collegiate Conference with students which costs $1,000 per person) becomes a financial burden on the faculty member. More financial support for faculty scholarship and conference attendance would help.

CIS faculty should be managing CISB internships within the department. Currently, a business faculty member is managing the internships, which does not address some of the issues already referenced in this document. CIS faculty managing the internships would lead to more interaction with potential employers, lead to other internships, lead to other interactions between faculty/students/working professionals/AITP, and keep the CIS faculty updated as to what industry professionals in the Grand Valley look for in new hires.

Many CIS graduates pursue employment outside of the area. This re-enforces the importance of faculty travel to conferences, and faculty interaction with professionals outside of the CMU service region.

C. Trends in the discipline that could affect future planning for program

Notable trends in the discipline include an increased interest in data analytics related to big data. A number of high tech job reports list Data Analyst as one of the most highly sought after jobs in the coming decades. Additionally, information security has become an area that is receiving greater interest in the corporate arena as well as in the government arena. These two areas offer significant opportunity for the CIS program to provide quality educational opportunities. Data Analytics is directly related to business disciplines because its primary intent is to inform business decision-making. Although more mathematically based than many other business disciplines, a well-educated data analyst with the proper business knowledge can surpass the analyst that simply knows how to "crunch the numbers." Interpretation within the context within which the decision will be made is invaluable to the business community.

Security analysts with exposure to the behavioral aspects of security can be of significant value to the corporate and the government environments. When paired with a quality program that views security from a technical and algorithmic perspective, the graduate in information security within the business department can offer the corporate security manager a well-rounded perspective of both the technical and business drivers of information security.

Job placements in the CIS field continue to head in a positive direction, according to the U.S. Bureau of Labor Statistics, as shown in the following Table 6.1.

Role	% Growth by 2022	# Job Growth by 2022
Computer & IS Manager	15%	50,000+
Systems Analysts	25%	127,700
System Developers	22%	20,000
Web Developer	20%	222,600
Information Security Analyst	37%	27,200
Database Administrator	15%	17,900
Computer Support Specialist	17%	125,000
Network Systems Administrator	12%	42,900
Network Architect	15%	21,000

(http://www.bls.gov/ooh/computer-and-information-technology/, 2014)

A disturbing trend is what appears to be a ten-year cycle of low enrollments in the CIS field. This is a national trend in the STEM (Science, Technology, Engineering, Mathematics) fields, rather than a CMU phenomenon. This is a thread in the pedagogical literature that the CMU CIS faculty continue to pursue.

Another challenge is to find curricular focus among the long list of list of current & future trends in Information Systems, which include:
- Mobility & device diversity
- BYOD, addressed by many orgs, to be addressed by many, many more
- Mobile applications
- Internet of Everything
- Hybrid Cloud & IT as a service broker
- Cloud/Client architecture
- Personal Clouds – shift to services & away from apps
- Software defined anything – standardization of infrastructure programmability
- Web-Scale IT – enterprise service as if a cloud service
- Smart machines – widespread AI-controlled devices
- 3-D printing – "instant" delivery of products
- Semantic web
- Data analytics
- Social computing3-Dimensional User Interfaces
- Augmented Reality/Gesture Recognition User Interfaces
    Digital v. Paper Textbooks

D. How program review process is being used to improve the program's teaching and learning.

The program review will be utilized to lend direction to the faculty as the program adapts to the changing business climate. The external reviewer's comments will be used to identify new teaching opportunities, learning opportunities, and professional development opportunities.

E. Recommendations: Program's challenges and potential resources needed to address them

The CIS faculty is currently involved in a faculty search which could assist in broadening the educational offerings for the students, scholarship opportunities for the faculty, and community outreach opportunities.

As noted earlier in several places in this report, the CIS faculty will consider curriculum changes targeted at (1) updating courses, (2) adding more elective courses for CIS and majors, (3) providing more opportunities for BBA students to select an information systems program as a second concentration, (4) fulfilling the emerging role in the Department of

Business's SLO on strategic use of information, and (5) creating one or more courses that address the projected university SLO on information literacy, if requested. The development costs associated with these efforts should be realized with faculty release time.

The CIS server room (DH 302) needs to be remodeled slightly to accommodate its use in teaching information security courses. To be used as a lab, (1) the built in book shelf needs to be removed, (2) the switch rack needs to be moved closer to the door, (3) counter tops need to be installed along the north and south walls. The servers should be replaced and software (to be determined later) needs to be acquired. Wireless access should also be created for students to use their laptop computers when there are other classes in DH 303, the primary access point to the server. In the past, management of the server room by a work study student has proven to be totally unworkable. Therefore, there needs to be faculty release time to manage the server room. Total cost to accomplish this is estimated at $20,000, not including faculty release time.

As explained above in Section 6B, faculty scholarship efforts are important for CIS faculty to stay current in the discipline. Yet, those opportunities are restricted based on limited funds available for travel to conferences and to training sessions. There are similar limits on student opportunities to travel to compete in annual competitions. The travel budget for faculty should be increased to at least $2000 per faculty per year ($10,000 for five CIS faculty). Student travel funds should be allocated at a rate of $5000 per year per club.

> Overall, CMU's CIS program is healthy, thriving, and has a promising future. This is reflected in the student and faculty successes presented in this self-study along with the increased demand for CIS courses.

Appendix A

Faculty Vitae

Curriculum Vitae
DONALD A. CARPENTER

ACADEMIC DEGREES:

D.Div. American Institute of Holistic Theology 2004 General Theology
          Birmingham, Alabama

Ph.D. University of Nebraska 1992 Management Information Systems,
          Lincoln, Nebraska Management Science, Computer Science,
          Production & Operations Management

M.B.A. University of Colorado 1984 Information Systems
          Colorado Springs (post-MBA study, Marketing, 1984-85)

B.S.   Kearney (NE) State College 1971 Business Administration

PROFESSIONAL EXPERIENCE:

2003-Present Colorado Mesa University, Grand Junction, CO
          Professor of Computer Information Systems

2000-2003   University of Nebraska at Kearney
          Professor of Management Information Systems
          Director, Global Sources Information Technology Program

1985-2000   University of Nebraska at Kearney
          Professor of Computer Science & Information Systems
          Chair, Department of Computer Science & Information Systems

1980-1985   Pikes Peak Community College, Colorado Springs
          Instructor of Computer Information Technology

1984-1985   University of Colorado – Colorado Springs
          Part time "honorarium" faculty for Introduction to Marketing

1982-1983   Lundy Electronics (of Glenhead, NY) (during leave from PPCC)
          Mountain States District Manager, based in Colorado Springs

1972-1980   Burroughs Corporation (now UNISYS), Colorado Springs
          Territory Manager, Zone Sales Manager, Account Manager

1969-1972   RGIS Inventory Specialists, Kearney, Lincoln, Kansas City
          Crew Member/Supervisor Kearney & Lincoln (part time)
          District Manager Kansas City (full time)

CONTACT AND PERSONAL INFORMATION:

Office: Department of Business
      Colorado Mesa University
      Domínguez Hall 301c
       1400 Houston
      Grand Junction, Colorado 81501

Phone: 970-248-1580 Email: dcarpent@mesastate.edu FAX: 970-248-1730

Personal: US citizen, born 1/22/49 in Lexington, NE; Widowed, 4 grown children.

PRINCIPAL ONGOING COLLEGIATE ACTIVITIES:

Member, Chair, CMU Faculty Senate's Graduate Curriculum Committee.
Member, Former Chair, CMU Faculty Senate's Undergraduate Curriculum Committee.
Ex Officio Member, CMU Graduate Studies Advisory Committee.
Chair, CMU Business Department's M.B.A. Committee.
Coordinator, CMU Business Department's newsletter development.
Coordinator, CMU Business Department's curriculum development.
Participant on CMU's Computer Information Systems program's teams for faculty search, continuous improvement, ABET accreditation, lab management, curriculum changes, program/course assessment, program review, etc.

PROFESSIONAL AND ACADEMIC ASSOCIATION MEMBERSHIPS:

Mountain Plains Management Association, Board of Directors, President (06-08); presenter, discussant, session chair, reviewer (since 2003) conference co-organizer, web master, Proceedings editor (2004,09,11)
Society for Case Research, member, reviewer, discussant, session chair (since 2013)
Decision Sciences Institute, member, reviewer, discussant (since 1992)
Western, Midwest, Southwestern Decision Sciences Institute, member, presenter, discussant
Association for Information Technology Professionals (formerly DPMA) (since 1972)
Association for Computing Machinery, former member, presenter (1985-2003)
ISECON, AICIS, and others (reviewer, presenter) (since 2003)

PRINCIPAL ONGOING RESEARCH:

Exploration of relationships between meaningfulness and motivation among information technology workers and general workforce. 2002-present.

Information requirements determination, enterprise information modeling, and General Systems Theory study of common enterprise information needs. 1972-present.

Pedagogy in CIS and Assessment in Business. 1985-present

COURSES TAUGHT:

CISB at Colorado Mesa University, 2003-20xx:
100 Basic Computer Skills
101 Business Information Technology
    (computer literacy/skills)
131 COBOL Programming
210 Fundamentals of Info Systems
395 Enterprise Architecture
331 Advanced Business Programming
(COBOL/Simulation/Java, HTML/CSS/PHP/MySQL)
392 Theories and Practice in CIS
400 Data Communications & Network Management
410 Project Management
442 Systems Analysis and Design
451 Database Administration
460 Electronic Commerce Systems
471 Advanced Info Systems (capstone)
491 Directed Readings
493 Independent Study
496 Special Topics
500 Management of Info Systems (MBA)
505 Advanced Project Management (MBA)
560 Advanced E-Commerce Systems (MBA)

Other at Colorado Mesa University, 2003-20xx
BUGB 105 Freshman Business Seminar
BUGB 530 Research Design (MBA)
BUGB 595 Research Practicum (MBA)
MARK 335 Sales & Sales Management
MARK 350 Marketing Research
MARK 500 Marketing Strategy (MBA)
BUGB 520 Topics: Project Management (MBA)
MANG 510 Organizational Theory & Behavior (MBA)

PPCC, UCCS, UNK, (unduplicated), 1980-2003:
Hardware, Software & Architecture
Operating Systems
AS/400 Operations
FORTRAN Programming
BASIC Programming
Assembler Programming
RPG IV Programming
Computer Simulation
Computer Assisted Instruction
Computer Managed Instruction
Principles of Marketing
Salesmanship

SCHOLARSHIP LEADING TO PUBLICATIONS

INVITED CHAPTERS:

Carpenter, D. A. & Agrawal, V.K. (2010). Why, When and What to Outsource, in St. Armant, K. (2009). IT Outsourcing: Concepts, Methodologies, Tools and Applications, Vol. 1. Hershey, PA: Business Science Reference. 1-18.

Agrawal, V.K. & Carpenter, D. A. (2010). Planning for Information Systems Outsourcing, in St. Armant, K. (2009). IT Outsourcing: Concepts, Methodologies, Tools and Applications, Vol. 2. Hershey, PA: Business Science Reference. 474-487.

Schulz, P. F. & Carpenter, D.A. (2008). Talent Management, Performance Management and the Management of Organizational Knowledge: The Case for a Congruent Relationship, in Vaiman, V., & Vance, C. (2008). Smart Talent Management. 176-191.

Schulz, P. F. & Carpenter, D.A. (2008). Critical Considerations of Talent Management & Knowledge Management for effective HR Planning, in Vaiman, V., & Vance, C. (2008). Smart Talent Management. 19-32.

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Agrawal, V.K. & Carpenter, D. A. (2007). Planning for Information Systems Outsourcing, in Schneiderjans, M.J., et al. (2007) Outsourcing Management Information Systems. Idea Group Publishing. 43-62.

Carpenter, D.A., and Schniederjans, M. (1994). Total quality management of multimedia development projects. In Reisman, S., Ed. Multimedia Computing: Preparing for the 21st Century. Idea Group Publishing. 195-224.

REFEREED JOURNALS ARTICLES:

Carpenter, D.A., & Hodge, K. (2015, under review). Too big for his britches. Journal of Case Studies.

Carpenter, D.A., & Hodge, K. (2015, under review). Send him with Todd. Journal of Case Studies.

Carpenter, D.A., Hodge, K., & Joyner, F. F. (2014, under review). Who's training whom? Journal of Critical Incidents.

Carpenter, D.A., & Hodge, K. (2014). You're Not Good Enough. Journal of Case Studies, 32(1). 60-64.

Carpenter, D.A. (2013). Open source software volunteerism vs. motivating potential of primary employment: suggestions for a research agenda. Journal of Information Systems Applied Research,6(2). 22-30.

Carpenter, D.A.,. McGinnis, D., Slauson, G.J., & Snyder, J. (2013. A longitudinal study assessing the Microsoft Office skills course. Information Systems Education Journal, 11(4). 66-83.

Snyder, J., Carpenter, D.A., Slauson, G.J., Skinner, J., & Nash, C. (2012). Beyond the bake sale: fundraising and professional experience for students involved in an information systems student chapter. Information Systems Education Journal,10(6), 72-83.

Slauson, G.J., Carpenter, D.A., & Snyder, J. (2011). Four systems to initiate in the Foundations of Information Systems course to support the IS 2010 Model Curricula and to retain students. Information Systems Education Journal, 9(5), 71-76.

Carpenter, D.A., Snyder, J., Slauson, G.J., & Bridge, M.K (2011). Additional support for the information systems analyst exam as a valid program assessment tool. Information Systems Education Journal, 9(4). 73-79.

Carpenter, D.A., Bridge, M.K., Snyder, J., & Slauson, G.J. (2009). The Information Systems Analyst exam as a program assessment tool: Pre-post tests and comparison to the Major Field Test. Issues in Information Systems, X(2). 355-363.

Slauson, G.J., Snyder, J., & Carpenter, D. A. (2009). Encouraging students to learn on the fly in CIS courses. Information Systems Education Journal, 7 (66).

Snyder, J., Slauson, G.J., & Carpenter, D. A. (2009). An action plan to increase IS enrollment based on recent survey evidence. Information Systems Education Journal, 7 (65).

Agrawal, Vipin K., Carpenter, D.A. & Agrawal, Vijay K. (2009). Impact of Radical and Incremental Changes on Students. Journal of Business Case Studies.

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Slauson, G.J., Carpenter, D.A., Snyder, J. (2008). Copyright ethics: Relating to students at different levels of moral development. Information Systems Education Journal, 6 (8).

Snyder, J., Carpenter, D.A., Slauson, G.J. (2007). MySpace.com – A Social Networking Site and a Social Contract Theory. Information Systems Education Journal, 5 (2).

Carpenter, D.A. (2003). Meaningful information systems internships. Journal of Information Systems Education, 14 (2). 201-210.

Carpenter, D.A. (2003). Reinforced learning in the data communications course using a teleprocessing line speed decision support system. Journal of Information Systems Education, 14 (1). 51-58.

Schniederjans, M.J., & Carpenter, D.A. (1996). A heuristic job scheduling decision support system: A case study. International Journal of Decision Support Systems,18. 159-166. ANBAR International Excellence Award.

Carpenter, D.A. (1994). Refining database design: Teaching with analogies. Journal of Computer Science Education, 8(2). 20-21.

Carpenter, D.A., Anders, J. & Anderson, A. (1993). Influence of Myers-Briggs type and preference for data presentation format. Journal of Computer Information Systems, 33(4). 85-90.

Carpenter, D.A. (1992). Are we teaching database design properly? Journal of Computer Information Systems, 33(1). 9-12.

PROFESSIONAL BOOKS:

Carpenter, D.A. (1996, 1993, 1988, 1986). Managing Teleprocessing Systems. Kearney, NE: Antelope Bookstore. (600 page text book was originally under contract with Prentice-Hall, but was withdrawn, published locally, sold at cost to UNK students.)

Carpenter, D.A. (1994). Casebook for McFadden, F., & Hoffer, J. (1994), Modern Database Management, 4th ed. Redwood City, CA: Benjamin Cummings Publishing.

Carpenter, D.A. (1993). Development of an Information Requirements Determination Methodology: Utilization of Normative Analysis from a Universal Enterprise Information Model. Ann Arbor: University Microfilms International Dissertation Service.

PEER REVIEWED CONFERENCE AND PROCEEDINGS PAPERS:
        *=personally presented

*Carpenter, D.A., & Slauson, G. J. (2014, under review). Do students appreciate the motivating potential score of work? Proceedings of 56th Mountain Plains Business Conference. [Pocatello, ID, October 2014.]

*Davis, C., & Carpenter, D.A. (2014, under review). Are businesses prepared for cyber warfare? Proceedings of 56th Mountain Plains Business Conference. [Pocatello, ID, October 2014.]

*Carpenter, D.A., & Hodge, K. (2014). Too big for his britches. Proceedings of 36th Annual Society for Case Research Summer Case Writer's Workshop. [Rock Hill, SC, June 2014].

*Carpenter, D.A., & Hodge, K. (2014). Send him with Todd. Proceedings of 36th Annual Society for Case Research Summer Case Writer's Workshop. [Rock Hill, SC, June 2014].

Carpenter, D.A., & Hodge, K. (2014). Too big for his britches. (Embryo.) Proceedings of Annual Meeting of Society for Case Research. [Chicago, March 2014].

Carpenter, D.A., & Hodge, K. (2014). Send him with Todd. (Embryo.) Proceedings of Annual Meeting of Society for Case Research. [Chicago, March 2014].

*Carpenter, D.A. (2013). Experiential learning by instructor role playing in systems analysis and design class. Proceedings of 55rd Mountain Plains Management Conference. [Cedar City, UT, October 2013.]

Carpenter, D.A., & Hodge, K. (2013). What about Todd? Proceedings of 35th Annual Society for Case Research Summer Case Writer's Workshop. [Danbury, CT, June 2013].

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*Carpenter, D.A., Slauson, G.J., McGinnis, D., & Snyder, J. (2012). Assessing the Microsoft Office skills course: computer-mediated delivery and pre-post-surveys. Proceedings of ISECON Conference. [New Orleans, October 2012].

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Riskey, K., & Carpenter, D.A. (2009). eBricksOnline: A Lego customer profile. Proceedings of the Mountain Plains Management Conference. [Grand Junction. October 2009].

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*Carpenter, D.A., Gabriel, L. K., Snyder, J., & Slauson, G.J. (2009). Creating the Right Computing Environment for a Computer Information Systems Program. Proceedings of the Mountain Plains Management Conference. [Grand Junction. October 2009].

Carpenter, D.A., Bridge, M.K., Snyder, J., & Slauson, G.J. (2009). The Information Systems Analyst exam as a program assessment tool: Pre-post tests and comparison to the Major Field Test. International Association of Computer Information Systems (IACIS) annual conference [Pittsburg, September 2009].

Bridge, M.K., Carpenter, D.A. & Barbee, P (2009). A Comparison of Two Local Price Indexes. Abstract published, The International Business and Economics Research Conference, Las Vegas, NV, October 5-7, 2009.

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*Carpenter, D. A., & Bridge, M. K. (2008). Total college experience: A student perspective. Proceedings of Mountain Plains Management Conference. [Pocatello, ID, Oct 2008].

Carpenter, D. A., & Bridge, M. K. (2008). Factors contributing to student success: Expanding a study. Proceedings of Western Decision Science Conference [San Diego, March 2008].

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*Agrawal, Vipin K., Carpenter, D.A. & Agrawal, Vijay K. (2007). Measuring radical change in systems analysis and design course. Proceedings of Mountain Plains Management Conference. 418-429. [Kearney, NE, Oct 2007]. Best Paper Award in Pedagogy Track.

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Winniford, M.A., Carpenter, D. A., Slauson, G.J., & Snyder, J. (2007) A survey of student mastery of computer skills: Pretest of ability. Proceedings of Mountain Plains Management Conference. [Kearney, Oct 2007].

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Snyder, J., Carpenter, D. A., & Slauson, G. J. (2006). MySpace.com - A Social Networking Site and Social Contract Theory. Proceedings of the Information Systems Educator Conference (ISECON). [Dallas, Nov 2006]. Selected for Meritorious Paper Award.

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*Carpenter, D. A., McGinnis, D., & Slauson, G.J. (2006) Motivating and Managing Computer Personnel in the 21st Century: A Pilot Study. Proceedings of Mountain Plains Management Conference. [Oren, UT, Oct 2006].

*Carpenter, D. A. & Bridge, M. (2006). Combining Assessment and Departmental Planning: Preliminary Stage of A Longitudinal Study. Proceedings of Mountain Plains Management Conference. [Oren, UT, Oct 2006].

*Carpenter, D. A. & Kizzier, D. M. (2006). Metaphors gone wild: The illusive machine cycle. Proceedings of International Association for Computer Information Systems (AICIS). [Reno, October 2006].

Carpenter, D.A. & Agrawal, V.K (2006). Which information systems functions should be outsourced? Proceedings of Midwest Decision Science Institute. [Indianapolis, April 2006].

Agrawal, V.K. & Carpenter, D.A. (2006). The future of information systems off-shore outsourcing. Proceedings of Midwest Decision Science Institute. [Indianapolis, April 2006].

Carpenter, D.A. & Agrawal, V.K (2006). Factors influencing growth of IT outsourcing. Proceedings of the Western Decision Science Institute Annual Conference. (Table topic). [Hawaii, April 2006].

Agrawal, V.K. & Carpenter, D.A. (2006). Outsourcing IT processes: Present and futuristic views. Proceedings of the Western Decision Science Institute Annual Conference. (Table topic) [Hawaii, Apr 2006].

*Carpenter, D.A., McGinnis, D.R. & Slauson, G.J. (2005). Invalid predictors of future success in IT jobs. Proceedings of 47th Annual Conference Mountain Plains Management Association. [Cedar City, UT, Oct 2005.] Selected as Best Paper in CIS Track.

*Carpenter, D.A., McGinnis, D.R., & Slauson, G.J. (2005). Tying an operational budget to enterprise goals: A DSS for budget allocation among functional units. Proceedings of 47th Annual Conference Mountain Plains Management Association. [Cedar City, UT, Oct 2005.]

Carpenter, D.A, & Agrawal, V.K. (2005). IT-enabled transformation of business schools' core curriculum: A longitudinal study on radical change. Proceedings of the 2005 Annual Meeting of Midwest Decision Science Institute. [Toledo, Apr. 05.] Iota Alpha Delta Innovation Education Best Paper Award.

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*Carpenter, D.A. (2004). Fitting Logotherapy into motivational theories: New opportunities for research and consultation. Proceedings of the 46th Annual Fall Conference Mountain Plains Management Association. [Grand Junction, CO, October 2004.]

*Slauson, G.J. & Carpenter, D.A. (2004). Pedagogical justification for assigning a decision support system project in a fundamentals of information systems course. Proceedings, 46th Annual Conference Mountain Plains Mgmt Assoc. [Grand Junction, Oct 2004.]

*Agrawal, V.K. & Carpenter, D.A. (2004). IT-enabled transformation of business schools' core curriculum: Development of a product model. Proceedings of 46th Annual Fall Conference Mountain Plains Management Association. [Grand Junction, Oct. 2004.]

McGinnis, D.R. & Carpenter, D.A. (2004). Allocating operating budgets among academic units: Software solutions using goal programming. Proceedings of Academy of Business Administration 2004 National Conference. [Las Vegas, March 2004].

*Carpenter, D.A., & Agrawal, V.K. (2004). Integrating information technology throughout core business curriculum: Utilizing a universal database to model pervasive computing in modern business. Proceedings of the Western Decision Science Institute Annual Conference. [Manzanilla, Mexico, April 2004].

*Carpenter, D.A. (2004). Connecting Logotherapy with motivation theories: A research and consultation agenda. Proceedings of Western Decision Science Institute Annual Conference. (Abstract). [Manzanilla, April 04].

*Carpenter, D.A. (2003). Connecting Logotherapy with motivational theories: Plan for research & consulting regarding meaningfulness. Fourteenth World Congress on Logotherapy. [Dallas, June 2003]

Carpenter, D.A. (2003). Meaningful computer skills assignments: A personal weight control decision support system. Proceedings of Midwest Decision Sciences Institute Annual Conference. [Cincinnati, Apr 2003].

*Carpenter, D.A. (2002). Creating and Assessing a Core Business Curriculum Centered on Information Technology. Proceedings of Western Decision Science Institute Annual Conference. [Las Vegas, April 2002.]

Carpenter, D.A. (2001). Database Case Studies in Every Business Course. Proceedings of Decision Sciences Institute Annual Conference. 1313. [San Francisco, November 2001.]

*Carpenter, D.A. (2001). Can Cooperative Education be a Key to Rural Region IT Brain Drain? Proceedings of the Midwest Decision Sciences Institute Annual Conference. [Dearborn, MI, April 2001.]

Carpenter, D.A. (2001). Reinforcing Learning in the Data Communications Course: Using a Teleprocessing Line Speed Decision Support System. Proceedings of 34th Annual Midwest Instruction and Computing Symposium. [Waterloo, IA, April 2001.]

Schniederjans, M.J., & Carpenter, D.A. (1994). A case study of a heuristic-based DSS. Proceedings of the Fifth Annual Production and Operations Management Society. (Program abstract, p.5). [Washington, D.C., October 1994].

Carpenter, D.A. (1993). Improving the quality of teleprocessing line speed decisions. Proceedings of the Twenty-Fourth Annual Meeting of the Midwest Decision Sciences Institute, 24. 74 76. [Lansing, May 1993.]

Carpenter, D.A., Hough Feldman, A.E., & Gilpin, T.L. (1993). Presentation graphics in pedagogical materials. Proceedings of International Association for Information Management 8th Annual Conference. 253-263. [Orlando, December 1993.]

*Carpenter, D.A. (1992). A comprehensive universal enterprise information model. Proceedings of the Twenty-Third Annual Meeting of the Midwest Decision Sciences Institute, 23. 88-90. [Kansas City, May 1992.]

*Carpenter, D.A., Anders, J. & Anderson, A. (1992). Myers-Briggs type and preference for tabular versus graphical data. Proceedings of the Twenty-Third Annual Meeting of the Midwest Decision Sciences Institute, 23. 105-107. [Kansas City, May 1992.]

*Carpenter, D.A. (1992). A queuing-based model for support of multi-user teleprocessing systems line speed decisions. Proceedings of 20th Annual Computer Science Conference of Association for Computing Machinery, 20. 407-414. [Kansas City, Mar 92.]

*Carpenter, D.A., & Digman, L.A. (1991). A goal programming model for allocating operating budgets among academic departments. Proceedings of Twenty-Second Annual Meeting of Midwest Decision Sciences Institute, 22. 154-156. [Indianapolis, May 91.]

TRAINING VIDEOS:

Jussel, M.R. and Carpenter, D.A. (1997). Creators and consultants for Focus on Careers in Computer Technology. An instructional video produced by Nebraska Educational Television Consortium for Higher Education (NETCHE).

Carpenter, D.A. & Jussel, M.R. (1995). Creators and consultants for Making Your Team Work. An instructional video produced by Nebraska Educational Television Consortium for Higher Education (NETCHE).

Jussel, M.R. and Carpenter, D.A. (1993). Creators and consultants for Problem Solving in the Information Age. An instructional video produced by Nebraska Educational Television Consortium for Higher Education (NETCHE).

NEWSPAPER AND NEWSLETTER ARTICLES IN DISCIPLINE:

Slauson, G.J., Snyder, J., & Carpenter, D.A. (2008). Change dominates the scene in computer technology at the New Mesa State. Mosaic. The Magazine of Mesa State College, 9 (1), 7.

Carpenter, D.A. (2007). Is your work force motivated? MSC Entrepreneurial Business Institute's EBI EconoBiz Newsletter 3 (2). 6.

Carpenter, D.A. (2007). Curricular curios? Or what's happened since I graduated. MSC Computer Information Systems Newsletter, 1 (1). 3.

Carpenter, D.A. (2007). Proving our quality and how you can help. MSC Computer Information Systems Newsletter, 1 (1). 3.

Carpenter, D.A. (2006). Phishing, pharming, and spoofing: Businesses can fall prey to e-scams, too. MSC Entrepreneurial Business Institute's EBI EconoBiz Newsletter 2 (4). 5.

Carpenter, D.A. (2005, Feb. 17). Computer Technology Training Plays Critical Role at Mesa State. Grand Junction Free Press. 4.

Carpenter, D.A. (2005, Feb. 7). Technology Programs, Degrees Flourish at Mesa State College. Grand Junction Daily Sentinel. 4A.

Carpenter, D.A. (1995, March 2). Information superhighway still bumpy. Kearney Hub. 4A.

STUDENT MANUALS:

Carpenter, D. A. (1991). Student Lab Manual for SQL and SQL/DS-ISQL. For Database Systems class. UNK.

Carpenter, D. A. (1991). Preparing Students for College Computing: Answers to Common Questions. UNK.

MISCELLANEOUS SCHOLARLY WORKS:

Carpenter, D.A. (1992). Using a PC decision support system to demystify teleprocessing line speed calculations. In Masters of Innovation IV Abstracts of Entries. (Chicago: Zenith Data Systems). 21.

Carpenter, D.A. (1992). Streamlining information requirements determination using a universal enterprise information structure. Doctoral Dissertation Competition of the International Conference on Information Systems Annual Meeting. [Dallas, Dec 1992.]

DECISION SUPPORT SYSTEMS (COMPUTER SOFTWARE):

Teleprocessing Line Speed Decision Support System, 1992, 2001, 2003.
DSS for determining the proper line speed for multi-user teleprocessing systems. Incorporates elaborate queuing formula as opposed to the typically-used, overly-simplistic line calculation approach. Written in Paradox under MS/DOS; then in MS Excel and MS Access.

Manufacturing Employee Job Assigner, 1992.
DSS for assigning employees to manufacturing jobs using a heuristic to deal with extensive ergonomic constraints; developed using Paradox under MS/DOS for an electrical components manufacturer.

Job Sequence Determiner, 1991.
DSS for determining best sequence for a set of production jobs; created in 1988 for Enable 3.0 spreadsheet extensively utilizing macro command strings; runs either user-determined set of jobs or randomly generates a simulated job mix based on mean job characteristics supplied by user; explores random, first come first served, earliest due date, shortest processing time, & critical ratio rules to determine best fit; logs results for multiple runs; generates statistics on individual, mean and variance of job lateness; produces extensive graphics.

Strategic Acquisition Manager, 1991.
DSS for evaluating candidate firms for corporate takeover/merger; written in BASIC for MS/DOS systems; utilizes a zero-one goal programming model developed by Marc Schniederjans, U of Nebraska-Lincoln.

Personal Body Weight Controller, 1990, 2003, 2004.
DSS for determining the proper mix of exercise and caloric intake to reach target weight loss (or gain) within a specified time frame; considers the impact of age and gender on the metabolism; written in Enable spreadsheet; rewritten in MS Excel; then MS Access.

Class Performance Analyzer, 1990, 1995, 2000, 2003.
DSS for analyzing student and course grade performance; allows for what-if analysis based on projected changes to the grading scale; produces hard-copy output as a substitute for the classical grade book; written originally for Visicalc in 1981; re-written and enhanced in 1986 for Lotus-compatible spreadsheet packages; re-written and enhanced in 1986 for Lotus-compatible spreadsheet packages.

Academic Planning System, 1989, 2004.
DSS for considering & weighing budget distribution options among academic departments; utilizes zero-one goal programming; based on MicroManager software for MS/DOS systems; rewritten using Excel.

Academic Department Review Supporter, 1987.
DSS for managing, analyzing and reporting data pertaining to course enrollments, major and graduate counts; produces extensive graphics; written for Lotus-compatible spreadsheet packages.

Student Evaluation of Faculty Analyzer, 1985.
DSS for comparing and graphing the results of evaluations of multiple instructors, multiple semesters, and multiple courses; written for Lotus-compatible spreadsheet packages.

OTHER SCHOLARSHIP

INVOLVEMENT WITH STUDENT RESEARCH:

Faculty practicum advisor for 15 MBA students. August 2014 – May 2015.

Faculty advisor for eight students for CMU Student Showcase. April 2014.

Faculty practicum advisor for 10 MBA students. August 2013 – May 2014.

Faculty advisor for one student for CMU Student Showcase. April 2012.

Faculty Mentor to Sarah Emery, Ryan Woodward, (2011). Should the use of teams be a required aspect of higher education? Proceedings of the 53rd Mountain Plains Management Conference. [Grand Junction. October 2011]. Best Graduate Paper Award.

Faculty Mentor to James Diem, (2011). Should all software be open source software?
Proceedings of the 53rd Mountain Plains Management Conference. [Grand Junction. October 2011].

Faculty Mentor to Mariah Zerbe, Paul Barbee, Michael Hughes (2009). Environmental ethics and triple bottom line. Proceedings of the 51st Mountain Plains Management Conference. [Grand Junction. October 2009].

Faculty Mentor to Carrieann Conner, Bob Kretschman, Ryan LaCount (2009). Employer Responsibility for Self-Actualization and Motivation. Proceedings of the 51st Mountain Plains Management Conference. [Grand Junction. October 2009].

Faculty Mentor to Tonya Snyder (2009). Should Humans Be Implanted With Nanobots? Proceedings of the 51st Mountain Plains Management Conference. [Grand Junction. October 2009].

Faculty Mentor to Kenneth Riskey. (2008). eBricksOnline: A Lego customer profile. (Mesa State College MBA Practicum)

Faculty Mentor to Chad Hensley (2008). Information technology staffing in colleges and universities: Identifying contributing factors.   (Mesa State College MBA Practicum)

Faculty Mentor to Juliana Munoz . (2005). Extreme Programming. Second place in student paper competition at AITP's National Collegiate Computer Conference. [Atlanta, April 2005].

Faculty Mentor to Katrina MacLeod. (2004). Should governments be allowed to tax electronic commerce transactions. Proceedings of Proceedings of the 46th Annual Fall Conference Mountain Plains Management Association. [Grand Junction, CO, October 2004.] Winner of Best Student Paper competition.

Faculty Mentor to Karen Etter. (2004). Should Internet filtering be used in America's libraries? Proceedings of 46th Annual Fall Conference Mountain Plains Management Association. [Grand Junction, CO, October 2004.]

Faculty Mentor to Janice Danforth. (2004). Should marketers adhere to the CAN-SPAM Act of 2003? Proceedings of 46th Annual Fall Conference Mountain Plains Management Association. [Grand Junction, Oct 2004.]

Faculty Mentor to Mary Classen, "Exploring the Relationship Between Personality Indicators and Political Party Preference, 1st Place in Professional/Applied Sciences division of UNK Student Research Day 1999.

Helped students refine and published articles based on student research papers. See: Carpenter, Anderson & Anderson and Carpenter, Hough-Feldman & Gilpin, in list of publications on previous pages herein.

SUCCESSFUL GRANTSMANSHIP ACTIVITIES:

Oct 12 – May 13   CMU Faculty Development Grant.

Sep 00 – May 03 Managed donation from UNK alumnus for Global Sources Program. $200,000 per yr for 5 yrs.

Apr 95 NU Foundation for CSIS CASE/UNIX student computer lab. Result: $32,000 + $50,000 from UNK CNSS.

Jan 95 UNK Academic Computing Committee Grant request. Result: $850 for CSIS remote course delivery.

Jun 93 Request to Central Point Corporation. Result: $2000 anti-virus software donation.

Apr 90 Proposal to KSC for improving CSIS faculty computing. Result: $30,000 for multimedia computer.

Sep 89 KSC request for a UNIX computer for CSIS. Result: $25,000 from AT&T, Nebr Dept Ed, KSC.

Apr 89 Request to Southern Computing Systems. Result: $2000 KeyEntry3 software donation.

Jul 87 Request to Information Technology, Inc. Result: $8400 Excelerator software donation.

Jun 86 Request to AutoDesk, Inc. Result: $3000 AutoCAD software donation.

Jun 85 Pikes Peak Community College external request. Result: $150,000 computer Hewlett-Packard.

Mar 82 Pikes Peak Community College external request. Result: $80,000 computer, Digital Equipment Corp.

May 81 Pikes Peak Community College Faculty Improvement Grant. $600 classroom microcomputer.

COMPETITIVELY SELECTED PRESENTATIONS:

See "Conference and Proceedings Papers," above. Presented papers are preceded by an asterisk.

INVITED PRESENTATIONS:

Oct 2011 Panel on "Student Teamwork: Best Practices." Mountain Plains Management Conference. Grand Junction.

Oct 2011 Abstract "To APA or Not to APA: A Question of Commitment." Mountain Plains Management Conference. Grand Junction.

Oct 2010 Panel on "Should Collegiality Be a Requirement for Tenure." Mountain Plains Management Conference. Layton/Ogden, Utah.

Oct 2009 Panel on "Rural Economic Development." Mountain Plains Management Conference. Grand Junction.

Oct 2008 "Workshop on Critical Thinking." Mesa State College Leadership Academy. Grand Junction.

Oct 2005 "Predictors of Future Success in IT Jobs." Workshop and after-dinner presentation. Mile High Chapter of Association of Information Technology Professionals (AITP). Denver.

Oct 2004 Master of Ceremonies, banquet at Mountain Plains Management Assoc. Annual Meeting, Grand Junction.

Jun 2003 "IS Legal, Ethical and Personnel Issues." Week of lectures. Rostock University. Rostock, Germany.

Dec 2002 "Computer Security." Future Problem Solving Seminar sponsored by ESU #11, Holdrege.

Oct 2001 "Survey of Local Web Sites." Global Sources E-Commerce Symposium. Kearney Chamber of Commerce.

Mar 01, 02 "Web Genealogy." Senior Citizens Heads-Up Conferences. UNK.

Nov 1999 "Information Systems Assessment." City Manager, Council, Department Heads. City of Kearney, NE.

Nov 1999 Interviewed regarding Y2K problems and predictions on KGFW Radio's Talk of the Town.

Feb 1999 "Using WWW for Student Interaction in Satellite Courses." 1999 Annual Conference of Adult and Continuing Education Association, Grand Island.

Dec 1998 "Computer Error." Future Problem Solving Seminar sponsored by ESU #11, Holdrege.

Nov 1998 "Information Systems Planning." City Manager, Council Department Heads. City of Kearney, NE.

Oct 1998 "WWW & HTTP: Planning an IS Infrastructure." Nebraska Panhandle Economic Development Council.

Apr 1998 "Focus on Computer Technology Careers." Infotec Midwest Information Technology Expo and Conference. Sponsored by Aksarban IITP. Omaha.

Feb 1998 "Making Your Team Work." 1998 Conference of Adult and Continuing Education Association, Kearney.

May 1996 Panel presentation on distance education to UNK Chancellor's Advisory Committee.

Oct 1995 "Try Teaching Database This Way."   4th Nebraska Secondary Computer Studies Educators Forum. University of Nebraska at Kearney.

May 1995 Grant proposal presentation to University of Nebraska Foundation Board of Directors.

Apr 1995 Presentation on Instructional Telecommunications to University of Nebraska Board of Regents.

Oct 92-99 Emcee at each CSIS Nebraska Secondary School Computer Studies Forum and Programming Contest.

Dec 1994 "Information Structures to Support Scholarly Research: A General Systems Theory Approach." Arts and Sciences Luncheon Research Colloquium at the University of Nebraska at Kearney.

Oct 1994 Panel Moderator, Internet Lesson Plans by Educational Technology Masters Degree Students.
     3rd Nebraska Secondary School Computer Studies Forum. U of Nebraska at Kearney.

Aug 1994 "The Computer as an Instructional Tool: Evaluating, Authoring and Using CAI Software." Elementary Teacher In-Service Training Session. Beaver Valley Schools, Danbury, NE.

Nov 1993 "Preparing Secondary Students for College Computing / Are We Teaching Database Properly?" North Central Kansas Computer Teachers Conference. Educational Service Center, Concordia.

Oct 1993 "Teaching Introduction to Computer Science Using Multimedia Presentations." Second Nebraska Secondary Computer Studies Educators Forum. U of Nebraska at Kearney.

Oct 1993 Panel Moderator, Multimedia Projects of Educational Technology Masters Degree Students.
     2nd Nebraska Secondary School Computer Studies Forum. U of Nebraska at Kearney.

Sep 1993 Panel Member, Career Awareness Week, sponsored by Career Services, UNK.

Oct 1992 "Computer Fundamentals in Law Enforcement." Forty-first Annual Convention of Police Officer's Association of Nebraska. Grand Island.

Oct 1992 "Preparing Students for College Computing" & "Teaching 4GL Programming." 1st Nebraska Secondary Computer Studies Educators Forum. U of Nebraska at Kearney.

Nov 1991 Session Chair, Statistical & Quant Methods Track Decision Sciences Institute Annual Meeting.

Nov 1991 "What Qualifies as Research in Computer Information Systems?" Faculty Development Colloquium, Dept of Computer Science & Information Systems at UNK.

Oct 1991 "A Goal Programming Model for Budget Allocations Among Academic Departments." Arts and Sciences Luncheon Research Colloquium at the University of Nebraska at Kearney.

Apr 1991 "Preparing Secondary Students for College Computing." Annual Conference of the Nebraska Educational Technology Association. Omaha.

May 1990 "Use of Spreadsheet Software to Teach Simulation." Annual Conference of the Nebraska Educational Technology Association. Omaha.

Oct 1989 Interviewed for News Watch on "Friday the 13th"/"Columbus Day" virus by Nebraska TV Network.

Apr 1989 "Are We Teaching Database Properly?" Annual Conference of Nebraska Educational Technology Association. Omaha.

Jan 1984 Invited Keynote Speaker, Colorado Springs School District 11 Staff In-Service Conference;
        Topic: "Trends in Computer Use in Educational Settings."

Fall 1983 Panel Member, Education Night, Southern Colo Chapter, Data Processing Management Association;
        Topic: "Computer Education Programs in Colorado Springs."

MANUSCRIPTS REVIEWED:

2013-present Reviewer for Society of Case Research conference, workshop, journals.

2004-present Reviewer for several papers for annual Mountain Plains Management Conference.

2000-present Reviewer for several papers for Midwest and Western Decision Science Institute.

2006-present. Ad Hoc Reviewer on Editorial Team for Decision Sciences Journal.

2006-present. Reviewer for several papers for ISECON and IACIS.

Nov 1999 Watson, Richard T., (2000). Data Management: Databases and Organizations, 2nd ed.

1997-99 Reviewed many papers as member, Editorial Board of Academy of Information & Management Sciences.

Apr 1996 Blind reviewer for three papers for the Management Information Systems Track of the 27th Annual Meeting of the Decision Sciences Institute. [Orlando, FL, November 1996.]

Mar 1993 Blind reviewer for three papers for the Management Information Systems Track of the 24th Annual Meeting of the Decision Sciences Institute. [Washington, D.C., November 1993.]

Mar 1987 Luce, Thom, Introduction to Computer Hardware, Systems Software, Operating Systems, (Santa Cruz:
        Mitchell Publishing, 1989). A "blind" review of the author's initial manuscript proposal.

Fall 1983 Leeson, Marjorie, Systems Analysis and Design, Second Edition, (Chicago: Science Research Associates, 1985). During planning phase for 2nd ed. Participation acknowledged in Preface.

OTHER MONOGRAPHS

ACADEMIC PROGRAM REVIEWS:

Aug-Oct 2014 Co-authored Self-Study for 2007-14 Academic Program Review of CIS program at CMU.

Jul 2007 Self-Study for 2002-07 Academic Program Review of Computer Information Systems at MSC.

Sep 1999 External Reviewer, School of Information/Computer Science, Georgia Southwestern State U.

May 1995 Member of External Review Team, UNK's Management and Marketing Department.

Sep 1988 Member of External Review Team, UNK's Chemistry Department.

1990,1995,2000 Wrote Self-Study Reports for UNK's Dept. Computer Science & Information Systems.

POSITION PAPERS AT KSC/UNK/MSC/CMU:

2012 Plan to switch CIS programs from IS2002 to IS2010 Model Curriculum at CMU.

2006 Plan for expanding course fees for Computer Information Systems Courses at Mesa State College.

2006 Draft for new faculty evaluation instrument for Business Department at Mesa State College.

2000-03 College of Business and Technology Annual Information Technology Report, incl. faculty survey results.

2000-03 Several position papers on improving the MIS curriculum and MIS portion of the business core & MBA.

2000-01 Several internal/external documents related to Global Sources Information Technology Pgm.

1985-on Proposals for Improving Labs & Physical Facilities, Computer Science & Information Systems.

Jan 1996 "Department-Specific Instructional Technology at UNK." Faculty Senate's Academic Computing Committee.

Apr 1995 "Recommendations for Outsourcing of Personal Computers at UNK." Academic Computing Committee.

Apr 1995 "Recommendation About UNK's World Wide Web Home Page." Faculty Senate's Academic Computing Committee.

Mar 1995 "Recommendations for Academic Computing Usage at UNK." Faculty Senate's Academic Computing Committee.

Aug 1994 "Resolution for Computer Competency Requirement at UNK." Academic Computing Comm.

Nov 1991 "Proposal for a System Administrator for CS&IS Department." Result: agreed but no funding.

Mar 1991 "Plan for Improving CS & IS Department's Computing Facilities." Adopted by department.

Mar 1990 "Future of KSC Academic Computing." Result: Faculty Senate comm on academic computing

Jan 1989 "Proposal: Four Standing Committees in Computer Science & Information Systems." Adopted.

Nov 1987 "Proposal for Dept Status for Computer Science & Information Systems," co-author. Granted.

Oct 1986 "Unified Model for Instructional Computing at KSC." Result: college system $13M proposal; incl. in Nebr. Legislature's appropriation bill 770 (Jan 1990); $25,000 funded for further study.

Mar 1986 "Proposal to Create Information Systems Programs at KSC." Result: majors, minor, courses.

Nov 1985 "Goals & Objectives, Computer Science & Information Systems Programs." Result: Adopted.

Sep 1985 "Proposal for the Master of Science in Educational Technology Degree." Result: Approved.

MISCELLANEOUS:

2002-03 Kearney (NE) Little League. Constitution, By-Laws, Standard Procedures & Job Descriptions.

1990-00 UNK CS&IS Department, Annual Newsletter editor, plus "Message from the Chair," and others.

1993-00 UNK Department of Computer Science and Information Systems, "Continuous Self-Study."

1990,95 U of Nebraska at Kearney, "Computer Science & Information Systems Dept Policy & Procedures Manual."

1985-00 University of Nebraska at Kearney, CS & IS student advising literature & informational sheets.

Mar 83   First Congregational Church of Colo. Springs, "Administrative Policy Guide" personnel policy.

1979-80 Burroughs Corporation, "Standard Small Computer Systems Sales Proposal."

1978-79 Quasar Computer Service, Marketing Manual, sales literature pieces, part of employee manual

1972-75   Burroughs Corporation, "Small Computer Systems Installation Guide."

1970-72 Tau Rho (local) Fraternity at Kearney State College, "Constitution and By-Laws."

NOVELS AND POETRY:
2010 Professing: An Inspiring Novel of Hope in the Voyages of Angels Series.
2010 Who the Heck is Beth? An Inspiring Novel of Peace in the Voyages of Angels Series.

2010 Crises Notepad: An Inspiring Novel of Freedom in the Voyages of Angels Series.
2012(Under development). Just Dan: An Inspiring Novel of Valor in the Voyages of Angels Series.
2012 (Under revision). Love Songs and Vacuums. Volume of poetry.
2012 (Under revision). Growing Up and Somewhat Wise. Volume of poetry.
2013(Under development). Untitled: An Inspiring Novel of Faith in the Voyages of Angels Series.
2013 (Under development). Untitled. Volume of poetry.
2013 (Under development). Untitled: An Inspiring Novel of Innocence the Voyages of Angels Series.

COLLEGIATE SERVICE ACTIVITIES
AS CIS FACULTY AT COLORADO MESA UNIVESITY (Aug 2003 – Present)

Sep 2005 – Present   Business Dept. representative on Faculty Senate's Undergraduate Curriculum Committee. Vice Chair, 2006-2009; Chair, 2009-2010

Sep 2010 – Present   Chair & Business Dept. rep on Faculty Senate's Graduate Curriculum Committee.

Sep 2011 – Present   Ex officio member Graduate Studies Advisory Committee.

Aug 2011- May 2012   Member, Higher Learning Commission Level 3 Committee.

Jan 2007 - Present   Member, Business Department MBA Committee; chair 2013- Present

Aug 2005 - Present   Member of four CIS Committees on Curriculum/Advising, Assessment/ Accreditation, Public Relations/Faculty Development/Retention, and Facilities/Scheduling

Dec 10 – Oct 11   Assisted, prepared, & hosted 53rd annual conference of Mountain Plains Management Association, including: Created MPMA conference web site,
                    Maintained and managed emailing list of 4000 names,
                    Arranged track chairs, reviewers, discussants and session chairs,
        Edited Conference Proceedings and prepared CD,
        Created conference program and schedule,
        Served as master of ceremonies for business meeting and banquet.

Nov 2005 - Nov 2010 Member of MSC/CMU Human Resources Office's Benefits Advisory Group.

Sep 2006-May 2009 Ex Officio member, Western Colorado Community College Curriculum Committee

Dec 08 – Oct 09   Assisted, prepared, & hosted 51st annual conference of Mountain Plains Management Association, including: Created MPMA conference web site,
                    Maintained and managed emailing list of 6000 names,
                    Arranged track chairs, reviewers, discussants and session chairs,
        Edited Conference Proceedings and prepared CD,
        Created conference program and schedule.

Sep 2006 - May 2008   Member of Business Department's Academic Honesty Board

Aug 2006 - Aug 2007 Chair of CIS Committee on Assessment and Accreditation.

May 2005 - May 2007 Member, Faculty Senate's Salary and Benefits Committee.

May 2005 – May 2010   Coordinator of Business Department's assessment data collection and analysis activities.

Aug – Sep 2007 Created paperwork and championed to Curriculum Committee several CIS curriculum changes including: Course addition: CISB 470 CIS Lab Consultantship Program modifications: AA, BAS, BS in Computer Information Systems

Sep – Oct 2006 Created Paperwork and championed to Curriculum Committee several CIS curriculum changes including: Course modification: CISB 442 Systems Analysis and Design
Course modification: CISB 451 Database Administration
Course addition: CISB 300 Information Systems Architecture
Program modification: BS in Computer Information Systems
Program addition: Bachelor of Applied Science in Computer Information System

Sep – Oct 2005 Created paperwork and championed to Curriculum Committee several CIS curriculum changes, including: Course modification: CISB 500 Management of Information Systems
Course addition: CISB 470 Management of Information Systems
Course addition: CISB 560 Electronic Commerce Systems
Course addition: CISB 491 Directed Readings
Program modification: BS in Computer Information Systems

Aug – Oct 2004 Created paperwork and championed to Curriculum Committee several CIS curriculum changes, including: Course addition: CISB 100 Basic Computer Skills
Course addition: CISB 331 Advanced Business Programming
Course addition: CISB 460 Electronic Commerce Systems
Course deletion: CISB 131 COBOL Programming
Program modification: BS in Computer Information Systems

Oct – Nov 2006   Assisted Business Dept Head to create BBA concentration and four courses in Energy Mgmt

Mar 03 – Nov 04   Created Power Point presentation to recruit CIS majors; combined best ideas from several previous student and faculty presentations.

May-Aug 04   Created & taught CISB 496 / BUGB 520 Special Topics: E-Commerce Systems as a WebCT-delivered distance education course to twenty-seven students.

May-Jun 07   Created & taught MARK 496 / BUGB 520 Special Topics: International Electronic Marketing as WebCT-delivered distance education course to twenty-six students.

Mar-Aug 04   Designed, ordered equipment for, and supervised student lab assistant in creating new LAN to support e-commerce course, Dell server & five clients with Windows Server & Macromedia Suite.

Sep 2004   Authored proposal for Student Tech fees to improve general lab in Hou 103. Result: 17 new computers.

Jan 2007   Established contract between Business Dept. CIS Program and Microsoft Corp's Academic Alliance. This will save thousands of dollars annually for CIS labs, provide a service activity for CIS students, and provide opportunity to raise significant amount of funds for the student AITP chapter (computer club).

Mar 2007   Wrote proposal and coordinated successful efforts to expand CISB course fees to all CISB courses.

Summer 2006, 2007 Supervised overhaul of CIS dedicated computer labs (Houston Hall 103-104) to include: Linux & Java Integrated Development Environment Local Area Network with
> Omando, Eclipse, Apache, JBoss, MySQL, Open Office, Windows 2003 & Visual Basic Integrated Development Environment Local Area Network with Visual Studio.Net, Macromedia Suite, Office, Project, Visio, Oracle

Dec 03 – Oct 04   Assisted prepare & host 46th annual conference of Mountain Plains Management Association, including: Created MPMA conference web site,
> Maintained and managed emailing list of 7000 names,
> Served as track chair for both CIS and marketing,
> Arranged reviewers, discussants and session chairs,

Designed conference Proceedings CD format,
Supervised students who prepared 108 copies of CD,
Chaired two sessions and discussed two papers,
Served as master of ceremonies for banquet.

Aug 03-present   Participated in efforts to maintain & improve quality of Computer Information Systems program, including: ABET accreditation efforts,
> Annual program assessment,
> Changes to CIS admissions form,
> Change to CIS program sheets,

Curricular discussions,
ICCP IS exit examinations,
Review of recruiting letters,
Updates to program web pages.

AS PROGRAM DIRECTOR (9/85 - 8/88) & DEPT CHAIR (9/88 – 8/00),
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS, UNK:
  Ongoing Duties: Directed all aspects of ten major/minor/endorsement programs in CSIS.
> Coordinated, supervised, evaluated, counseled 6-7 full-time and several adjuncts.
> Chaired and/or directed activities of four CS and IS faculty search committees.
> Administered department budget (approx. $340,000, including personnel services).
> Established departmental administrative procedures and record keeping.
> Developed semester and summer class schedules. Conducted dept faculty meetings.
> Represented department on NSS College Council of Chairs and UNK Council of Chairs.
> Engaged in prospective student recruiting activities. Managed physical facilities.
> Publicized programs to high schools, community colleges, ESU's, and the public.
  Special Projects: Oversaw faculty discussions on potential merger of CS&IS and BMIS (1994-95).
> Coordinated changes to all major/minor/endorsement programs (85-87, 90-91 & 94-95).
> Developed new Educational Technology Master Degree Program and courses (1986).
> Developed new Information Systems undergraduate degree programs & courses to align with ACM IS and DPMA CIS-86 model curricula(1987).

Acquired department's first mini-computer systems & upgrade student & faculty labs (MS/DOS/Windows; IBM 3900 (VM/CMS); AT&T 3B2 (UNIX); DEC VAX750 (VMS); network)

Developed plan to improve facilities & worked to acquire faculty office computers.

Created CSIS Library/Resource/Reading Room & CSIS CASE/UNIX student computer lab.

Developed two brochures and a variety of student advising and recruiting materials.

Created 4 standing department committees. Waged campaign to gain department status.

Coordinated Academic Program Review & authored Self-Study Reports (Fall 90, Spg 95).

Hosted Secondary School Computer Educator Forums and Programming Contests (1992-95)

Created four courses and Minor in Midrange Client Server Applications Development.

AS ADVOCATE FOR IMPROVING ACADEMIC COMPUTING AT UNK:

Sep 85 – May 03   Supervised independent studies & class projects.

Spring-Fall 1986   Chaired VPAA's Ad Hoc Advisory Task Force on Instructional Computing. Developed/co-authored a campus-wide statement of instructional computing needs.

Spring-Fall 1986   Served on committee to computerize KSC Foundation/Alumni Office. Created data flow diagrams which were used as model to analyze operations of admin offices.

Fall 86-Spring 87   Served on State College Board of Trustees' RFI/RFP Task Force for 4 state colleges.

July - Sept 1988   Member of Academic Computing Task Force, appointed by State College Presidents.

Spring 1989   Member of VPAA's Ad Hoc Academic Computing Advisory Group.

Fall 1989   Developed justification of need for UNK Director of Academic Computing position; result: creation of Faculty Senate's Academic Computing Committee.

Fall 90-Spring 93   Advisor to Dean of Continuing Studies on creating computer labs at College Park,

Spring 1995   Member of Faculty Senate's Task Force on a Computing Competency Requirement.

Aug 90 – May 00   Faculty Senate's Academic Computing Committee. Secretary 92-96. Chair 99-00.

Oct 94 – May 96   Chair of UNK ACC's Telecommunications, Standards and Policies Subcommittees.

Dec 95 – Aug 98   Member of UNK Vice Chancellor for University Relations' Internet Task Force.

Spring-Sum 1996   Member of NU Provost's Committee on Special Information Technology Projects.

Fall 98-Spring 99   Member of NU Provost's Committee on Distance Education Policies.

May 97 - Feb 98   Chair, Chancellor's Search Committee for Director of Computer Services.

Nov 99 – May 00   Member of UNK Sr VCAA's Ad Hoc Committee on Information Technology

Nov 95 – May 03   Member of UNK Chancellor's Technology Advisory Committee.

Spring-Sum 1999   Surveyed Faculty Computing Preferences, Chancellor's Technology Advisory Comm.

Sep 00 - May 03   Chair, UNK Business and Technology Ad Hoc Information Technology Committee

OTHER UNK SERVICE ACTIVITIES:

Fall 85-Spring 87   Advised student chapter of ACM Machinery; Chaperoned field trip to Colorado.

February 1987   Participated in Partners in the Classroom exchange program at Papillion High School.

Summer 1987   Served on Dean's task force to improve student evaluations in NSS.

Nov 87 - Apr 88   Member of Search Committee for Dean of the School of Natural and Social Sciences.

Spring 1987   Member of Advisory Committee for the new Telecommunications Programs.

Jul 93 - Aug 95   Key Advisor for deciding students, through UNK Advising Center.

Oct 95 – May 96   Member of Sr.VCAA's Continuing Education & Expanded Campus Task Force.

May 1996   Member, Criminal Justice's Peer Review Committee & author of committee's report.

Spring 1997   Member of Faculty Search Committee for Department of Management and Marketing.

Oct 92 – Oct 99   Volunteer for NU Foundation's Faculty & staff Campaign.

Dec 92 – Dec 96   Member, UNK's Evaluation Team: Who's Who in American Colleges & Universities.

Sep 97 – May 03   Member of Dean of Continuing Education's Summer Synergy Committee.

Dec 99 – May 03   Member of NU Provost's committee to administer new Entrepreneurial Awards.
Sep 01 - May 03   Advisor to student chapter of Association for Information Technology Professionals.
Sep 00 – May 03   Member, College of Business and Technology Dean's Council.
Sep 85 – May 03   Member, Council of Department Chairs/Directors (secretary, 95-96) (chair, 96-97)

AS DIRECTOR OF GLOBAL SOURCES PROGRAMS AT UNK (Aug 2000–JUN 2003)

Interacted with the program donor and his representatives to embellish the program;

Created advertising pieces for the program and promoted the program on and off-campus;

Sponsored community technology forums and served as presenter and master of ceremonies;

Supervised the student loan processes (solicited, approved and maintained contact with recipients;

Produced annual reports and proposals for improving the program;

Managed $1,000,000 donation, which was spread over five years.

COMMUNITY SERVICE ACTIVITIES

RELATED TO PROFESSION:

Supervised dozens of CIS and MBA Marketing student teams as they performed analysis projects for local businesses. (2007-present).

Creation and management of Western Slope Electronic Mall for free advertising space for local small businesses (www.wsemall.com) (2004-present).

Consulted (pro bono) to Museum of Western Colorado on database design (summer 2013).

Consulted (pro bono) to City of Kearney on improving information management procedures (1998-2003).

Consulted to Scotts Bluff County Law Enforcement Unification Project; info requirements of eight law enforcement agencies (County Sheriff, 4 Police Depts, Jail, County Attorney, Comm Center). '99

Visited Kearney High School programming classes to discuss careers in computing (Oct 97, 98, 99, 00).

Conducted computer training sessions for Nebraska Public Power District, Kearney office (Summer 94).

Nebraska Department of Education's Computer Science Endorsement Committee (Spring 1994).

Nebr. Dept. of Education's Technology Training, Competencies, and Advance Degrees Task Group (1992-1994).

Analyzed electronic bulletin board system capacity problems, Educational Service Unit #10 (Nov 1992).

Designed and programmed a relational database DSS for an electronic components manufacturer to assign manufacturing workers to a desired mix of jobs under extensive ergonomic constraints (Fall 91-Spg 92).

Advised Kearney Public Schools on district-wide database; conducted normalization, (Nov 94 - Feb 95).

Solved a "non-programmable" problem for Kearney Dart Association by designing league schedules that meet extraordinary constraints and satisfy several conflicting goals (January 1988).

Served as Expert Witness in computer fraud civil case to be argued in U.S. District Court (1984-85).

Supervised and coordinated student class projects, internships, and independent studies to accomplish "live" projects as a volunteer service to industry (September 1985 - present) including:
    Simulation projects: The paper flow of a financial aid office; UNK course registration process;
        Scheduling for a home cleaning service; Flow through a micro beer brewery;
        Fish life cycle activity in a fishing pond; Riders on college bus route.
        Customer traffic for a retail grocery chain; Traffic at 25th St. and 2nd Ave.;
        Operations of college food service; Customer queues for several restaurants;
        Freight shipping for clothing chain; Log-ons for an Internet service provider.
    Advice on acquisition of computer systems: Phelps County Board of County Commissioners;
        Retail appliance store; Two manufacturers; Central Platte Natural Resource District
    Design/development of software: Educational Service Unit; many businesses & college offices.

Served populations in several Nebraska communities by teaching overload & summer classes on demand in computer science, information systems, and educational technology in Grand Island (13 semesters), Holdrege (1 summer), North Platte (1 summer), Sutherland (1 summer), Omaha (1 summer and 2 semesters), Bellevue (1 summer), Nebraska City (1 summer), Columbus (2 semesters), Trenton (4 summers), McCook (1 semester), and via satellite from UNK campus (7 courses over 4 summers).

GENERAL:

Neighborhood volunteer, March of Dimes (Feb 2005).
Coach, Monument Little League 15-16 year olds (Grand Junction) (spring-summer 2004).
Unity Center of Central Nebraska, presented sermons on Mother's Day and Christmas Sunday, 2003.
Chair, Political Action Committee to get out the vote for Kearney City Bond Issue (winter 2002.)
Member, Kearney Little League Board of Directors (Fall 1999 – Summer 2003) (president 2001-03).
Coach, Kearney Little League youth baseball teams (Springs and summers of 1997-2003).
Assistant Coach, Kearney Midget Football youth teams (Falls of 1997, 1999).
Assistant Coach, Kearney Soccer Club youth teams (Falls and springs of 1994-1997).
Announcer and Score Keeper for Kearney Blue Jay Midget baseball home games (Summer 1993).
Volunteer work, First Congregational Church of Colorado Springs:
    Member of Board of Christian Education (1978-80), chairman (1980)
    Youth Group Sponsor and Youth Class Teacher (1978-79),
    Presented sermon on Christian Education Sunday (1980), on Pledge Sunday (1984),
    Member of Board of Deacons (1981-82), Presented seminars in self-esteem (1984).
    Assistant Moderator (1983), Moderator (chief administrator and lay leader) (1984),

SAMPLE OF OTHER ACTIVITIES:

Oct 2001   Organizer, Sponsor, Master of Ceremonies, Global Sources E-Commerce Symposium.

Sep 1999   Master of Ceremonies, First Annual Kearney Technology Fair, sponsored by Kearney Area Society for Computer and Information Professionals and Kearney Area Chamber of Commerce.
May 1998   Facilitator of Pew Roundtable Discussion for UNK's College of Business and Technology.
Mar 1998   Moderator at Barbara Simon's keynote presentation at UNK's Annual World Affairs Conference.
May 1995   UNK Faculty Retreat & panel member on a student computer applications competency requirement.
1988-2000   Periodic UNK Arts and Science Luncheon Research Colloquium highlighting research.
1988-2000   Sigma Xi's presentation of research sponsored by UNK's Research Services Council.
1988-2003   Biennial World Affairs Conferences, University of Nebr at Kearney (host, session chair).
1988-92   Periodic UNK College of Natural and Social Sciences "Think Breaks"
Feb 88,91   Grant Writing Seminars at the University of Nebraska at Kearney.
Spring 1987 The Possible Dream, an institutional planning conference at Kearney State College.
Sep 86-91   Annual Symposium on Research in Education at the University of Nebraska at Kearney.
Oct 1986   Chair Development Conference in Management, Leadership and Motivation, Ft. Hays, KS.
Jun/Sep 86 Nebraska State College Board's Academic Computing System Development Conferences.
Mar 1986   Local Area Networking Seminar at the University of Nebraska at Omaha.
Nov 1984   Computing Directions for the 80's, seminar sponsored by Hewlett Packard Co. in Denver.
May 1984 10th Anniversary Conference of the Information Systems Programs at U of CO – Colo Springs.
Jun 83,84   Annual Conventions of the American Banking Association, in Los Angeles and Chicago.
Apr 79-85   Annual Conventions of Southern Colo. Chapter of Data Processing Management Assn.

SAMPLING OF OTHER ACTIVITIES:

Oct 2001   Organizer, Sponsor, Master of Ceremonies, Global Sources E-Commerce Symposium. Kearney.

Sep 1999   Master of Ceremonies, First Annual Kearney Technology Fair, sponsored by Kearney Area Society for Computer and Information Professionals and Kearney Area Chamber of Commerce.

May 1998   Facilitator of Pew Roundtable Discussion for UNK's College of Business and Technology.

Mar 1998   Moderator at Barbara Simon's keynote presentation at UNK's Annual World Affairs Conference.

May 1995   UNK Faculty Retreat & panel member on a student computer applications competency requirement.

1988-2000   Periodic UNK Arts and Science Luncheon Research Colloquium highlighting current UNK research.

1988-2000   Sigma Xi's presentation of research sponsored by UNK's Research Services Council.

1988-2003   Biennial World Affairs Conferences, University of Nebraska at Kearney (host, session chair).

1988-92   Periodic UNK College of Natural and Social Sciences "Think Breaks"

Feb 88,91   Grant Writing Seminars at the University of Nebraska at Kearney.

Spring 1987 The Possible Dream, an institutional planning conference at Kearney State College.

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Oct 1986   Chair Development Conference in Management, Leadership and Motivation, Ft. Hays, KS.

Jun/Sep 86   Nebraska State College Board's Academic Computing System Development Conferences.

Mar 1986   Local Area Networking Seminar at the University of Nebraska at Omaha.

Nov 1984   Computing Directions for the 80's, a seminar sponsored by Hewlett Packard Company in Denver.

May 1984 10th Anniversary Conference of the Information Systems Programs at U of CO – Colo Springs.

Jun 83,84   Annual Conventions of the American Banking Association, in Los Angeles and Chicago.

Apr 79-85   Annual Conventions of the Southern Colo. Chapter of Data Processing Management Association.

HONORS AND RECOGNITION:

Excellent rating for annual performance evaluation for 2003-2010, 2012

Exemplary rating for annual performance evaluation for 2011, 2013

Colorado Mesa University, first recipient of Associated Student Government's monthly faculty parking space award (Sep 2010).

Best Paper Award at International Business and Economics Research Conference for Bridge, M.K., Carpenter, D.A. & Barbee, P (2010). Developing a local price index. (Oct 2010).

Mesa State College: Nominated for Distinguished Faculty Award (May 2009).

Associated Student Government and Chamber of Commerce Outstanding Educator Award (May 2008). Best Paper in Pedagogy Track Award at Mountain Plains Management Conference for Agrawal, Vipin K., Carpenter, D.A. & Agrawal, Vijay K. (2007). Measuring radical change in systems analysis and design course. (Oct 2007).

Mesa State College: Nominated for Distinguished Faculty Award for Scholarship (May 2006).

Meritorious Paper Award at Information Systems Educator Conference (ISECON) for Snyder, J., Carpenter, D. A., & Slauson, G. J. (2006). MySpace.com - A Social Networking Site and Social Contract Theory. (Nov 2006).

Best Paper in CIS Track at Mountain Plains Management Association Fall Conference for Carpenter, D.A., McGinnis, D.R. & Slauson, G.J. (2005). Invalid predictors of future success in IT jobs. (Oct 2005).

Iota Alpha Delta Innovation Education Best Paper Award at Annual Meeting of Midwest Decision Sciences Institute for Carpenter, D.A, & Agrawal, V.K. (2005). IT-enabled transformation of business schools' core curriculum: A longitudinal study on radical change. (Apr 2005).

Selected as member of Iota Alpha Delta honorary fraternity for above awarded paper. (Apr 2005).

University of Nebraska at Kearney: Nominated and elected to Phi Kappa Phi honorary fraternity (2002).

University of Nebraska at Kearney: Nominated for Pratt-Heins Award for Teaching Excellence (1998, 1999).

University of Nebraska at Kearney: Selected for inaugural "Profiles in Excellence" program (Aug 1998).

Citation of Excellence Award from the ANBAR Management Intelligence association for Carpenter, D.A. (Joint Author) (1996). "A heuristic job scheduling decision support system: a case study." Article originally appeared in The International Journal of Decision Support Systems, 18 (2). Award presented fall 1997.

University of Nebraska at Kearney: Recognition of ten years of service (Apr 1995); 15 yrs (Apr 2000).

University of Nebraska at Kearney: Honorary Member by student chapter of ACM (May 94 & May 97).

University of Nebraska at Kearney: Outstanding Service Recognition by student Mortar Board (Feb 94).

Kearney State College: Tenured & promoted to Associate Professor after 3 1/2 years of service at KSC;

Kearney State College: Elected 1st Chair of Computer Science & Information Systems (Aug 88).

Kearney State College: Certificate of Appreciation from President for Partners in Classroom (Apr 1987).

Kearney State College: Residence Life Honor Roll for special assistance given new students (Sep 86).

Pikes Peak Community College: Recognition by president for efforts to improve academic computing environment (Apr 85).

Pikes Peak Community College: Nomination for Outstanding Occupational Studies Instructor Award (Apr 82).

Burroughs Corporation: President's Honor Roll & Legion of Honor for exceeding sales and billing quotas (73, 74, 75).

CERTIFICATIONS:

Full-time Colorado Vocational Credential in Data Processing, Marketing, and Management (1980-1990).

DAVID L PUMPHREY

Doctoral Candidate - Management Information Systems
School of Business Administration
University of Mississippi, 226 Holman Hall, University, MS 38677
(662) 816-4927
Email: dpumphrey@bus.olemiss.edu

EDUCATION

2014 (Expected) PhD, Management Information Systems. University of Mississippi, Oxford, MS

1992 M.S., Computer Information Systems. Georgia State University, Atlanta, GA

1987 B.S.B.A Data Processing & Quantitative Analysis. University of Arkansas, Fayetteville, AR

PUBLICATIONS

Pumphrey, D., Aiken, M., & Vanjani, M. (2011). A Research Model for Multilingual Electronic Meeting Systems. *Business Research Yearbook*. 110.

PRESENTATIONS

Eason, C., Pumphrey, D. (2012) Stuckiness: Exploring Online Social Media Usage. Presented at the Southeast Marketing Symposium. Knoxville, TN, February 2012.

Reithel, B. & Pumphrey, D. (2013). Android Forensics. 2013 Mississippi Digital Forensics Conference hosted by the Federal Bureau of Investigation

HONORS

Outstanding PhD Student for the University of Mississippi School of Business Administration, 2012-2013

DISSERTATION

Mr. Hyde or Dr. Jekyll: The mindsets and characteristics of the information security professional

Abstract: Information security professionals have a unique challenge in today's connected world. They are charged with protecting digital assets from individuals, groups, and even government agencies whose behavior is mostly unbounded. Information security professionals must have the mindset and skills of those who seek to harm their organization but are not allowed to retaliate, in kind. Instead, they must use these skills only to predict and to

prevent future attacks, thus using their technical prowess for good and not for evil. The purpose of this person-centered study is twofold: to classify the mindsets of information security professionals that influence their behavior and to identify the characteristics that predict membership in a particular class. Within each classification, I determine the characteristics, such as trait competitiveness, creativity, technical ability, deviousness, distrust, and moral values, influencing class membership. Not only will the results of this research contribute to information security practice by helping determine types of security professionals and the characteristics to look for in the selection process, but it will, also, further information security research by suggesting links between technical skills of information security professionals and the individual characteristics driving the acquisition and use of those skills.

CURRENT RESEARCH INTERESTS AND FOCUS

My primary interest is the behavioral characteristics of information security professionals and the drivers of the deviant behavior of the people they are charged to stop. Following my initial study of the behavioral characteristics of information security professional, I intend to extend this research into the study of hacker behavioral characteristics and their similarity to those of the information security professional. I, also, leverage my practical experience into the study of software development team formation and the use of agile software development approaches. Therefore, I have an interest in contributing to and extending theory of agile software project management, selection and formation.

RESEARCH IN PROGRESS

Pumphrey, D. & Eason, C. "Hotel California effect on social networking: The inadequate explanation of the network effect on individuals' social media migration"

Reithel, B., Pumphrey, D, Guo, X., & Mukhopadyay, S. "Counterproductive spoliation behavior of I.S. professional in eDiscovery"

Pumphrey, D, Ammeter A., & Reithel B. "Determinants of Senior IT Management Decisions to Hire Virtual IT Contractors"

Novicevic, M. & Pumphrey D. "Latent class analysis: A review of the management literature"

CLASSROOM/TEACHING

Joint teaching appointment in both Information Systems and Computer Science

2013 Fall	CSCI 103 – Survey of Computing (45 students)
2013 Summer	CSCI 111 – Computer Science I (Java Programming) (17 students)
2013 Spring	CSCI 103 – Survey of Computing (49 students)

BUS 400 – Agile Software Development. (11 students). Created course material and providing instruction to MIS & Computer Science students.
MIS 309 – Managing Information Systems (Teaching Assistant, 130 students)

2012 Fall   CSCI 103 – Survey of Computing (44 students)
MIS 309 – Managing Information Systems (Teaching Assistant, 130 students)

2012 Spring   MIS 309 – Managing Information Systems (42 students)
MIS 309 – Managing Information Systems (Teaching Assistant, 130 students)

2011 Summer   MIS 309 – Managing Information Systems (24 students)

2011 Spring   MIS 619 – Information Systems Strategy (Teaching Assistant, 75 students)

PROFESSIONAL EXPERIENCE

2005 - 2010   *Information Technology Management*. Tulsa, OK. Provided strategic direction for mid-tier oil & gas exploration & production information technology department.

2003 – 2005   *Software Development Management*. Tulsa, OK. Provided direction to software development teams. Product & project management.

2000 – 2003   *Enterprise Architect*. Tulsa, OK. Guided technical direction for over 500 software development professionals in Java & Microsoft.NET software development at national energy generation & distribution company

1993 – 1999   *Enterprise Consultant*. Atlanta, GA. Consultant to numerous information technology departments for mid-sized and Fortune 500 companies.

1987 – 1993   *Programmer, Systems Analyst, Project Manager*. Ft. Smith, AR; Atlanta, GA. Various programming, analyst, & project management roles for companies in insurance, transportation, & credit scoring industries.

Professional/Practitioner Resume available on request

Gayla Jo Slauson

Colorado Mesa University • Department of Business
1100 North Avenue • Grand Junction • Colorado • 81501
(970) 248-1794 • gslauson@coloradomesa.edu
September 2014

Educational History:

MBA   May, 1992, University of Southern Colorado (Now CSU-Pueblo)\

BBA, emphasis in Computer Information Systems.   May, 1990, Mesa State College (now Colorado Mesa University) graduated Summa Cum Laude and Student with Highest GPA.

Additional certifications:
- CCP (Certified Computing Professional), 1994
- MOUS (Microsoft Office Specialist – Excel), 2013

Employment History:

Associate Professor: 2004 – present, Computer Information Systems, Colorado Mesa University

Assistant Professor: 1998-2003 Computer Information Systems, Mesa State College

Instructor: 1993-1998 Computer Information Systems, Mesa State College

Lecturer: 1990-92 Computer Information Systems, Mesa State College (taught twelve one credit classes and over 700 students each year)

Additional prior employment as a bookkeeper, receptionist, cashier, tutor and spreadsheet consultant.

Teaching Achievements:

Courses taught at university level:
Business:
Introduction to Business
Business Communications
Organizational Behavior
Business Mathematics
Principles of Marketing
Principles of Management

Introduction to Nonprofit Leadership

Computer Information Systems:
Business Information Technology
Introduction to Business Software
Advanced Business Software
Theories of Information Systems
Fundamentals of Information Systems
Management of Information Systems
Microcomputer Applications
Solving Problems using Spreadsheets and Statistical Software
Solving Problems in Business Using Database Software
COBOL I and COBOL II
BASIC
VBA (Visual BASIC for applications)
Access (Database)
Excel, Lotus 1-2-3 (Spreadsheets)
Word, Word Perfect (Word Processing)
PowerPoint (Presentation)

Other:
Introduction to Higher Education
Honors Courses
Courses for Teachers to earn CE Credits for Mesa County School District
Leadership Academy Sessions
Leading Edge Seminar Presenter for Small Business Development Center
Women in Management Course Presenter
Session teacher at two Women's conferences
Traveled to Kenya and worked with Kenyan entrepreneurs on business marketing plan in June, 2009

Sampling of Teaching Awards

- 1990-2014 Earned "Excellent" ratings for teaching from Department Chair, peers, students, and other administrators

- 2003 Awarded Wall of Fame Teacher Award by Academic Services at Mesa State College

- 1993 Awarded Outstanding Teacher Recognition Award by Grand Junction Chamber of Commerce

- 1990-Spring,2014 Consistently earned excellent teacher evaluation ratings

- 1990 Outstanding Future Business Teacher Award, 1st Place Nationally Phi Beta Lambda

Scholarly Achievements:

Articles appearing in Journals (limited to last seven years):

Snyder, J., and Slauson, G. (2014). Majoring in Information Systems: Reasons Why Students Select (or not) Information Systems as a Major. *Information Systems Education Journal.*

Carpenter, D., McGinnis, D., Slauson, G. & Snyder, J. (2013). Assessing the Microsoft Office Skills Course: Computer Mediated Delivery and Pre- and Post-Surveys. *Information Systems Education Journal,* 11(4), p. 66-83.

Snyder, J., Carpenter, D., Slauson, G., Skinner, J. and Nash, C. (2012). Beyond the Bake Sale: Fundraising and Professional Experience for Students Involved in an Information Systems Student Chapter. *Information Systems Education Journal,* 10(6), p. 72-83.

Slauson, G., Carpenter, D., & Snyder, J. (2011). Systems in the Foundations of Information Systems Course to Retain Students and to Support the IS 2010 Model Curricula. *Information Systems Education Journal,* 9(5), p. 71-76.

Carpenter, D., Snyder, M., Slauson, G., & Bridge, M. (2011). Additional Support for the Information Systems Analyst Exam as a Valid Program Assessment Tool. *Information Systems Education Journal,* 9(4), p. 73-79.

Slauson, G., Snyder, J., & Carpenter, D. (2009). Encouraging Students to Learn on the Fly in CIS Courses, *Information Systems Education Journal,* 7(66), p. 1-8.

Snyder, J., Slauson, G., & Carpenter, D. (2009). An Action Plan to Increase IS Enrollment Based on Recent Survey Evidence, *Information Systems Education Journal,* 7(65), p. 1-12.

Carpenter, D., Bridge, M., Snyder, J., & Slauson, G. (2009). The Information Systems Analyst Exam as a Program Assessment Tool: Pre-Post Tests and Comparison to the Major Field Test, *Issues in Information Systems,* X(2), p. 355-363.

Slauson, G., Carpenter, D., & Snyder, J. (2008). Copyright Ethics: Relating to Students at Different Levels of Moral Development, *Information Systems Education Journal 6(8),* p. 1-6.

Snyder, J., Carpenter, D., & Slauson, G. (2007). MySpace.com A Social Networking Site and Social Contract Theory, *Information Systems Education Journal,* 5(2), p. 1-11.

Articles Appearing in Other Publications

Carpenter, D., Slauson, G. & Snyder, J. (2008). Change Dominates the Scene in Computer Technology at the New Mesa State, *Mosaic Magazine, 9.1,* p. 7.

McGinnis, D., Slauson, G. (2002). Global IT Worker Shortage Perceived or Real?, Global Business Trends: Contemporary Readings, ABA (Academy of Business Management), pg 71

Refereed Proceedings Publications (limited to past nine years)

Snyder, J., and Slauson, G. (2013). Majoring in Information Systems: Reasons Why Students Select (or not) Information Systems as a Major. Proceedings of the 2013 ISECON.
*Distinguished Paper Award

Slauson, G. and Snyder, J. (2012). Asking the Right Questions to Change Perception of Business Students Regarding CIS Programs. Proceedings of the 2012 Mountain Plains Management Conference.

Carpenter, D., McGinnis, D., Slauson, G. and Snyder, J. (2012). Assessing Computer Skills Course and Computer Mediated Delivery via Pre- and Post-Surveys. Proceedings of the 2012 Information Systems Educators Conference.

Slauson, G. (2011). Using Easy Excel Tools with Clickers to Make Large or Small Classes on Any Subject Immediately Engaging. *Proceedings of the 2011 ISECON*

Snyder, J., Carpenter, D., Slauson, G., Skinner, J., & Nash, C. (2011). Beyond the Bake Sale: Fundraising and Professional Experience for Students Involved in an Information Systems Student Chapter. *Proceedings of the 2011 ISECON.*
*Best Paper Award, Pedagogy Track

Slauson, G., Carpenter, D., & Snyder, J. (2010). Three Systems to Initiate in the Foundations of Information Systems Course to Support the IS 2010 Model Curricula and Retain Students. *Proceedings of the ISECON.*

Carpenter, D., Snyder, J., Slauson, G., & Bridge, M. (2010). Additional Support for the Information Systems Analyst Exam as a Valid Program Assessment Tool. *Proceedings of the 2010 ISECON.*

Carpenter, D., Snyder, J., & Slauson, G. (2010). Motivating and Managing MBA Students versus Computer Professionals and Others. *Proceedings of the 2010 MPMC.*

Slauson, G. (2010). A More Comprehensive System Approach to Student Relationship Management in a Business Department to Improve Retention. *52nd Annual Mountain Plains Management Conference Proceedings*

Carpenter, D., Bridge, M., Snyder, J., & Slauson, G. (2009). The Information Systems Analyst Exam as a Program Assessment Tool: Pre-Post Tests and Comparison to the Major Field Test, *Proceedings of the IACIS Conference.*
*Best Paper Award, Pedagogy Track

Slauson, G., Snyder, J., & Carpenter, D. (2008). Capitalizing Quickly on the Information Asset by Learning-on-the Fly, *Proceedings of the MPMA Conference.*

Snyder, J., Slauson, G., & Carpenter, D. (2008). An Action Plan to Increase IS Enrollment Based on Recent Survey Evidence, *Proceedings of the ISECON.*

Slauson, G., Snyder, J., & Carpenter, D. (2008). Encouraging Students to Learn on the Fly in CIS Courses, *Proceedings of the ISECON.*

Carpenter, D., Slauson, G., Snyder, J. & Winniford, M. (2008). Motivating and Managing IT Professionals Versus Bankers, *Proceedings of the WDSI.*

Winniford, M., Slauson, G., Carpenter, D., & Snyder, J. (2007). A Survey of Student Mastery of Computer Skills: Pretest of Ability, *Proceedings of the MPMA Conference.*

Snyder, J., Slauson, G., Jackson, B., & Chaffin, T. (2007). Using the National Collegiate Conference as a Focal Point for an AITP Student Chapter's Annual Activities, *Proceedings of the ISECON.*

Slauson, G., & Snyder, J. (2007). Nano-Studies in a Business Course; Providing Small Portions of Information with Pointers to More Detail, *Proceedings of the MPMA Conference.*

Carpenter, D., Slauson, G., Snyder, J., & Winniford, M. (2007). Motivating And Managing Computer Personnel In The 21st Century: Expanding The Pilot Study, *Proceedings of the MPMA Conference.*

Lay, S., Parman, D., & Slauson, G. (2007). Developing a College Life Program to Retain Business Students, *Proceeding of the 49th Annual Mountain Plains Management Conference.*

Slauson, G., Carpenter, D. & Snyder, J. (2006). Copyright Ethics: Relating to Students at Different Levels of Moral Development, *Proceedings of the ISECON.*

Snyder, J., Carpenter, D., & Slauson, G. (2006). MySpace.com A Social Networking Site and Social Contract Theory, *Proceedings of the ISECON.*
*Meritorious Paper Award

Book Chapter and Study Guide

Slauson, G. & Grabow, C. (2003). Framing Leadership Issues for System Developers, Current Issues in IT Education, editor McGill, T. Chapter 10, ISBN 1-931777.

Slauson, G. (1997). Student Study Guide for Computers and Information Processing, Second Ed., Course Technology, ISBN 0-7600-4922-X.

Served as Reviewer and Session Chair

Information Systems Education Journal
Information Systems Education Conference
Mountain Plains Management Conference
CONISAIR Conference

Examples of Invited or refereed talks/presentations to professional meetings

Presentation at the Higher Learning Commission Conference, April 2014
Presentation Faculty Colloquium, February, 2010
Presentation for Leadership Academy, March, 2009
Presentation at the Senior Center on Identity Theft, 2006

Professional Affiliations:

AITP   Association of Information Technology Professionals
MPMA   Mountain Plains Management Association

Examples from Professional Service:

Faculty Trustee, elected position, 2013-2015 (participant in CMU's Board of Trustees Meetings and Events)

Steering Committee Member and Criterion Two Chairperson, leading the effort for Reaffirmation of Reaccreditation visit for CMU, Higher Learning Commission

Faculty Senate, represented Department of Business, served on executive committee and as Faculty Senate president 2010-2011

Campus Wellness Committee 2010-2012

Calendar Committee 2010-2014

Strategic Planning Committee for Mesa State College, 2010

Awarded Outstanding Service - Faculty Award , Mesa State College 2001

Examples from Community Service:
Board member of Strong Schools, Strong Communities, nonpartisan community group 2013-present

Stephen Minister in community, providing one-on-one ministry for individuals going through crisis, 2012-present

Layleader and fill-in speaker for various churches in the community, 2011 Layspeaker of the Year, Rocky Mountain Annual Conference United Methodist Churches

Served on Comprehensive Plan Focus Group for the City of Grand Junction, 2010

JOHNNY SNYDER

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(970) 248-1722 • http://www.coloradomesa.edu/~josnyder
josnyder@coloradomesa.edu
September 2014

Educational History:

M.S. March 2005; Nova Southeastern University, Ft. Lauderdale, Florida 33329;
Computer Information Systems

Ph.D. August 1999; University of New Mexico, Albuquerque, New Mexico 87131;
Applied Mathematics; Dissertation: "A Mathematical Analysis of Induced Defenses in a
Plant-Herbivore System," Advisor: Dr. Deborah Sulky

M.A. August 1991; University of New Mexico, Albuquerque, New Mexico 87131;
Applied Mathematics

B.A. April 1988; Fort Lewis College, Durango, Colorado 81302;
Major: Mathematics; Minor: Computer Science Advisor: Dr. Richard Gibbs

Employment History:

Professor: 2010 – present; Department of Business, Computer Information
Systems, Colorado Mesa University (formally Mesa State College),
Grand Junction, Colorado 81501

Associate Professor: 2005 – 2010; Department of Business, Computer Information
Systems, Mesa State College, Grand Junction, Colorado 81501

Associate Professor and Chair: 2003-2005; Department of Mathematics and Computer
Science, Sul Ross State University, Alpine, Texas 79832 and Universidad Autónoma de
Chihuahua, Chihuahua, Mexico

Assistant Professor: 1999-2003; Department of Mathematics and Computer Science;
Sul Ross State University, Alpine, Texas 79832

Assistant Professor: 1998-1999; Department of Mathematics and Computer Science;
Pacific University, Forest Grove, Oregon 97116

Faculty: 1994-1999; Department of Continuing Education; University of New Mexico,
Albuquerque, New Mexico 87131

Teaching Assistant: 1988-94 and 1997-98 Department of Mathematics and Statistics; University
of New Mexico, Albuquerque, New Mexico 87131

Adjunct Faculty: 1994-1997; Southwestern Indian Polytechnic Institute, Albuquerque, New Mexico 87121

Part-Time Instructor: 1994-1997; Department of Mathematics and Statistics, University of New Mexico, Albuquerque, New Mexico 87131

Graduate Assistant: 1994-1996; Minority Engineering Programs, College of Engineering; University of New Mexico, Albuquerque, New Mexico 87131

Other Employment:

From 1977 to 1988 positions included retail sales person, ski rental and repair shop employee and manager, ski lift operator and ski patrol, warehouse (shipping/receiving), construction trades and remodel work, restaurant and kitchen work.

Teaching:

Master's Committees/Advisement:

Leland Byers (MBA), 2011
    Fighting Monsters, and Being Taxed for it? A Look at Possible Government Taxation in Virtual Worlds
Justin Kawcak (MBA), 2011
    How Admissions Offices in Colorado are Using Social Media
Bill Adams (Natural Resource Management), 2002
    A Kill Rate Model for Texas Mountain Lions (MS Thesis)
Lynn Cassell (Biology), 2002
    Analysis of Vocalizations of Lilian's Race of the Eastern Meadowlark (*Sturnella magna lilianae*) in West Texas (MS Thesis)

Bachelor's Advisement/Senior Project Direction/Honors Thesis Supervision/Student Project Advisement:

Dustin DeLor (Computer Information Systems), 2014
    *Third Place, PC Troubleshooting Competition, AITP National Collegiate Conference
Michael Rowe (Computer Information Systems), 2014
    *Honorable Mention, PC Troubleshooting, AITP National Collegiate Conference
Dustin DeLor (Computer Information Systems), 2013
    *Third Place, PC Troubleshooting Competition, AITP National Collegiate Conference
Paul Ducray (Computer Information Systems), 2013
    *Honorable Mention, PC Troubleshooting
    Top Ten, Security Competition, AITP National Collegiate Conference

Steven Nolan and Heather Flaherty (Computer Information Systems), 2012
*Honorable Mention, Business Analytics Competition, AITP National Collegiate Conference
Sydney Jensen (Computer Information Systems), 2012
Student Showcase Paper
*Best in Track Award
Leyland Byers (MBA), 2012
Student Showcase Paper
Steven Nolan (Computer Information Systems), 2011
Paper accepted to Mountain Plains Management Association's annual conference
*Best Paper Award, Student Track
Megan Vogel (Computer Information Systems), 2011
Student Showcase Paper
*Best In Track Award
Triston Arisawa and Megan Vogel (Computer Information Systems), 2011
*Honorable Mention, Web Design, AITP National Collegiate Conference,   2011
Megan Vogel (Computer Information Systems), 2011
*First Place, Student Paper Competition
*Honorable Mention, Web Design, AITP National Collegiate Conference,   2011
Josh Major (Computer Information Systems), 2011
*Honorable Mention, Network Design Competition, AITP National   Collegiate Conference, 2011
Cole Nash (Management), 2011
*Honorable Mention, Network Design Competition,
*Third Place, Student Paper Competition, AITP National Collegiate   Conference, 2011
Nick Bjorklund (Economics/Finance), 2010
Paper accepted to the Second Annual Four Corners Conference on   Globalization
Lyndsay Yerbic (Computer Information Systems), 2010
*Honorable Mention, Student Paper Competition at the AITP National Collegiate Conference, 2010
Ed Cart (Computer Information Systems), 2010
*Honorable Mention, Student Paper Competition at the AITP National Collegiate Conference, 2010
Eve Edie (Computer Information Systems), 2009
Paper Accepted to the Student Track of the 2009 Mountain Plains   Management Association's Annual Meeting, Paper Included in Proceedings
Jon Williams (Computer Information Systems), 2009
Paper Accepted to the Student Track of the 2009 Mountain Plains   Management Association's Annual Meeting, Paper Included in Proceedings
*Best Paper Award, Student Track
Amanda Nesbit (Computer Information Systems), 2009
*Top Ten Placement, Student Paper Competition at the AITP National Collegiate Conference, 2009

Bill Jackson and Loren Gabriel (Computer Information Systems), 2008
>   ***Second Place Award, Web Site Design for the AFSCME Local 3375, AITP National Collegiate Conference, 2008**

Telicia Chaffin (Computer Information Systems), 2008
>   **Web Site Design Competition for the Manufacturers Council, AITP National Collegiate Conference, 2008**

Charles Smith (Computer Information Systems), 2008 Human Microchip Implantation
>   ***Top Ten Placement, Student Paper Competition at the AITP National Collegiate Conference, 2008**
>   ***Paper published in Volume 3, number 3 of *The Journal of Technology Management and Innovation*, 2008**

Telicia Chaffin (Computer Information Systems), 2007 From E-voting to I-voting
>   ***Presented at the 2007 MPMA Conference at Kearney Nebraska, included in proceedings**

AITP Team Banner Competition, 2007
>   ***First Place Award, Artistic Category, AITP National Collegiate Conference, 2007**

Bill Jackson and Jarrod Harper (Computer Information Systems), 2007
>   ***First Place Award, Web Site Design for the ASFCME Local 3375, AITP National Collegiate Conference, 2007**

Charles Smith (Computer Information Systems), 2007 Podcasting for Universities
>   ***Top Ten Placement, Student Paper Competition at the AITP National Collegiate Conference, 2007**

Telicia Chaffin (Computer Information Systems), 2007 E-voting
>   ***Third Place Award, Student Paper Competition at the AITP National Collegiate Conference, 2007**

Juliana Munoz (Computer Information Systems), 2006 The Corporate Social Responsibility of Pure-Play Sites versus Brick-and-Mortar Corporations
>   ***Presented at the 2006 MPMA Conference at Orem, Utah, included in proceedings**

Thomas Wolfe (Computer Information Systems), 2006 The E-Grocer Factor: Why Didn't It Work and How Can It Work Now
>   ***First Place Award, Student Paper Competition at the AITP National Collegiate Conference, 2006**

Bernie Calderon (Mathematics), 2004
>   An Analysis of the TExES Exam

Ida Ramirez (Mathematics), 2003
>   Numerical Solution of a Titration Problem

Jose Carillo (Mathematics), 2003
>   The Mathematics of Coupled Dynamical Systems

Erica Price (Mathematics), 2000
>   Stability of a Spring/Dashpot System

Classroom Teaching:

Institution	Courses Taught
University of New Mexico 1988 - 1998	Math 111, Mathematics for Elementary School Teachers I Math 112, Mathematics for Elementary School Teachers II Math 123, Trigonometry Math 129, A Survey of Mathematics Math 150, College Algebra Math 162, Calculus I Math 163, Calculus II Math 180, Business Calculus I Math 181, Business Calculus II Math 215, Mathematics for Elementary School Teachers III Math 264, Calculus III Math 314, Linear Algebra Math 316, Differential Equations
Southwestern Indian Polytechnic Institute 1995-1997	Math 150, College Algebra Math 162, Calculus I Math 163, Calculus II
Pacific University 1998-1999	Math 122, College Algebra Math 125, Pre-calculus Math 165, Introduction to Contemporary Mathematics Math 206, Numerical Linear Algebra Math 226, Calculus I Computer Science 230, Introduction to Software Tools
Sul Ross State University 1999-2005	Math 1300, Developmental Mathematics Math 1310, University Mathematics Math 1315, University Algebra Math 1320, Calculus I Math 1321, Calculus II Math 1342, Statistics Math 2320, Calculus III Math 3101/CS 3101, Departmental Seminar Math 3306/CS3306, Numerical Analysis Math 3306, Computing in Mathematics Math 3320, Differential Equations Math 3350, History of Mathematics Math 4360, Complex Variables Math 4390, Senior Project Math 5301, Graduate Special Topics GBA 3350, Business Statistics CIS 3323, Human Computer Interaction CIS 3360, Legal and Ethical Issues in Computing in Business CIS 3370, System Analysis and Design

Universidad Autónoma de Chihuahua (UACH) 2003-2005	GBA 5309, Quantitative Analysis and Decision Theory for Business GBA 5304, Management Information Systems
Colorado Mesa University (formerly - Mesa State College) 2005 - present	CISB 101, Business Information Technology CISB 205, Advanced Business Software CISB 206, Business Database Application Programming (VBA) CISB 210, Fundamentals of Information Systems CISB 241, Business Analysis CISB 305, Solving Problems Using Spreadsheets and Statistical Software CISB 306, Solving Problems with Databases CISB 341, Quantitative Decision Making CISB 395, Independent Study CISB 396, CISB Research CISB 400, Data Communication and Network Management CISB 442, Systems Analysis and Design CISB 451, Database Administration CISB 460, Electronic Commerce CISB 491, Directed Readings CISB 560, Electronic Commerce - MBA MANG 341, Quantitative Decision Making

Other Teaching Activities	
University of New Mexico, Department of Mathematics and the Office of the Provost 1990-1991	New Mexico Junior Mathematics Prognosis Exam Project (JUMP) - A statewide outreach program geared to increase success in high school mathematics programs.
University of New Mexico, Minority Engineering, Mathematics and Science Project 1994-1995	A tutoring/mentoring program designed to increase participation and success of underrepresented populations in the study of engineering disciplines.
University of New Mexico, Native American Program, College of Engineering 1994-1995	A resident program for Native Americans geared to increase participation and success of the student in the classroom.
Southern Pueblo Agency 1994-1995	A teaching initiative striving to certify Native American teachers who would then return to their pueblos to accept teaching positions in tribal schools.
Phillips Academy Andover, Massachusetts 1995	A residential program for students to increase their knowledge base for study in US institutions of higher education.
Sul Ross State University 1999-2004	PASS (Program for Academic Success and Socialization) A bridge program for first generation college students. This course

	taught skills and techniques necessary for students to thrive in the University.
Colorado Mesa University 2005 - present	As the faculty advisor to the student chapter of the AITP, I plan and conduct monthly meetings, recruit and train students to staff our fundraising activities, Computer Heroes (a computer hardware and software repair shop) and MSDNAA software provision for students in qualifying classes. I also mentor and train students to compete in the AITP's National Collegiate Conference.

Scholarly Achievements:

Articles appearing in Journals:

Snyder, J., and Slauson, G. (to appear 2014). Majoring in Information Systems: Reasons Why Students Select (or not) Information Systems as a Major. *Information Systems Education Journal.*

Snyder, J. (2013). Wikipedia: Librarians' Perspectives on Its Use as a Reference Source. *Reference & User Services Quarterly 53(2),* p.155-163; DOI: 10.5860/rusq.53n2.155

Carpenter, D., McGinnis, D., Slauson, G. & Snyder, J. (2013). Assessing the Microsoft Office Skills Course: Computer Mediated Delivery and Pre- and Post- Surveys. *Information Systems Education Journal,* 11(4), p. 66-83.

Snyder, J. (2013). Wikipedia in the Academic Environment: Faculty and Student Perspectives, *International Journal on E-Learning.* 12(3), p. 303-327.

Snyder, J., Carpenter, D., Slauson, G., Skinner, J. and Nash, C. (2012). Beyond the Bake Sale: Fundraising and Professional Experience for Students Involved in an Information Systems Student Chapter. *Information Systems Education Journal,* 10(6), p. 72-83.

Slauson, G., Carpenter, D., & Snyder, J. (2011). Systems in the Foundations of Information Systems Course to Retain Students and to Support the IS 2010 Model Curricula. *Information Systems Education Journal,* 9(5), p. 71-76.

Carpenter, D., Snyder, M., Slauson, G., & Bridge, M. (2011). Additional Support for the Information Systems Analyst Exam as a Valid Program Assessment Tool. *Information Systems Education Journal,* 9(4), p. 73-79.

Slauson, G., Snyder, J., & Carpenter, D. (2009). Encouraging Students to Learn on the Fly in CIS Courses, *Information Systems Education Journal,* 7(66), p. 1-8.

Snyder, J., Slauson, G., & Carpenter, D. (2009). An Action Plan to Increase IS Enrollment Based on Recent Survey Evidence, *Information Systems Education Journal,* 7(65), p. 1-12.

Carpenter, D., Bridge, M., Snyder, J., & Slauson, G. (2009). The Information Systems Analyst Exam as a Program Assessment Tool: Pre-Post Tests and Comparison to the Major Field Test, *Issues in Information Systems*, X(2), p. 355-363.

Snyder, J. (2009). Usability – A Teaching and School Service Project, *Journal of Information Systems Education* 20(1), p. 13-16.

Slauson, G., Carpenter, D., & Snyder, J. (2008). Copyright Ethics: Relating to Students at Different Levels of Moral Development, *Information Systems Education Journal 6(8)*, p. 1-6.

Snyder, J., Carpenter, D., & Slauson, G. (2007). MySpace.com A Social Networking Site and Social Contract Theory, *Information Systems Education Journal*, 5(2), p. 1-11.

Snyder, J. (1997). Stability Considerations for Numerical Methods. *SIAM Review*, 39(4), p. 755-760.

Snyder, J. (1995). A Brief History of Population Models. *The Pentagon*, Fall 1995, p.9-18.

Articles Appearing in Other Publications

Carpenter, D., Slauson, G. & Snyder, J. (2008). Change Dominates the Scene in Computer Technology at the New Mesa State, *Mosaic Magazine, 9.1*, p. 7.

Refereed Proceedings Publications

Snyder, J., and Slauson, G. (2013). Majoring in Information Systems: Reasons Why Students Select (or not) Information Systems as a Major. Proceedings of the 2013 ISECON. ***Distinguished Paper Award**

Snyder, J., and Lay, S. (2012). Implementing a Degree Qualifications Profile. Proceedings of the 2012 Mountain Plains Management Conference.

Slauson, G. and Snyder, J. (2012). Asking the Right Questions to Change Perception of Business Students Regarding CIS Programs. Proceedings of the 2012 Mountain Plains Management Conference.

Carpenter, D., McGinnis, D., Slauson, G. and Snyder, J. (2012). Assessing Computer Skills Course and Computer Mediated Delivery via Pre- and Post-Surveys. Proceedings of the 2012 Information Systems Educators Conference.

Snyder, J., Carpenter, D., Slauson, G., Skinner, J., & Nash, C. (2011). Beyond the Bake Sale: Fundraising and Professional Experience for Students Involved in an Information Systems Student Chapter. *Proceedings of the 2011 ISECON.*

Snyder, J. (2011). Wikileaks and Social Contract Theory. *Proceedings of the Four Corners Conference on Globalization.*

Snyder, J. (2011). Wikipedia: Librarians Perspectives' on Its Use as a Reference Source. *Proceedings of the 2011 MPMC.* ***Best Paper Award, Pedagogy Track**

Slauson, G., Carpenter, D., & Snyder, J. (2010). Three Systems to Initiate in the Foundations of Information Systems Course to Support the IS 2010 Model Curricula and Retain Students. *Proceedings of the ISECON.*

Carpenter, D., Snyder, J., Slauson, G., & Bridge, M. (2010). Additional Support for the Information Systems Analyst Exam as a Valid Program Assessment Tool. *Proceedings of the 2010 ISECON.*

Carpenter, D., Snyder, J., & Slauson, G. (2010). Motivating and Managing MBA Students versus Computer Professionals and Others. *Proceedings of the 2010 MPMC.*

Snyder, J. (2010). Wikipedia as an Academic Reference: Faculty and Student Viewpoints. *AMCIS 2010 Proceedings.*

Carpenter, D., Bridge, M., Snyder, J., & Slauson, G. (2009). The Information Systems Analyst Exam as a Program Assessment Tool: Pre-Post Tests and Comparison to the Major Field Test, *Proceedings of the IACIS Conference.*

Snyder, J. (2009). Wikipedia as an Academic Reference: Faculty Perspective, *Proceedings of the MPMA Conference.*
    *Best Paper Award, Pedagogy Track

Slauson, G., Snyder, J., & Carpenter, D. (2008). Capitalizing Quickly on the Information Asset by Learning-on-the Fly, *Proceedings of the MPMA Conference.*

Snyder, J. (2008). Cultural Dimensions of Web Design Elements, *Proceedings of the MPMA Conference.*

Snyder, J., Slauson, G., & Carpenter, D. (2008). An Action Plan to Increase IS Enrollment Based on Recent Survey Evidence, *Proceedings of the ISECON.*

Slauson, G., Snyder, J., & Carpenter, D. (2008). Encouraging Students to Learn on the Fly in CIS Courses, *Proceedings of the ISECON.*

Carpenter, D., Slauson, G., Snyder, J. & Winniford, M. (2008). Motivating and Managing IT Professionals Versus Bankers, *Proceedings of the WDSI.*

Winniford, M., Slauson, G., Carpenter, D., & Snyder, J. (2007). A Survey of Student Mastery of Computer Skills: Pretest of Ability, *Proceedings of the MPMA Conference.*

Snyder, J., Slauson, G., Jackson, B., & Chaffin, T. (2007). Using the National Collegiate Conference as a Focal Point for an AITP Student Chapter's Annual Activities, *Proceedings of the ISECON.*

Slauson, G., & Snyder, J. (2007). Nano-Studies in a Business Course; Providing Small Portions of Information with Pointers to More Detail, *Proceedings of the MPMA Conference.*

Carpenter, D., Slauson, G., Snyder, J., & Winniford, M. (2007). Motivating And Managing Computer Personnel In The 21st Century: Expanding The Pilot Study, *Proceedings of the MPMA Conference.*

Snyder, J. (2007). It's a Wiki-World: Utilizing Wikipedia as an Academic Reference, *Proceedings of the MPMA Conference.*

Slauson, G., Carpenter, D. & Snyder, J. (2006). Copyright Ethics: Relating to Students at Different Levels of Moral Development, *Proceedings of the ISECON.*

Snyder, J., Carpenter, D., & Slauson, G. (2006). MySpace.com A Social Networking Site and Social Contract Theory, *Proceedings of the ISECON.*
    *Meritorious Paper Award

Bridge, M., Snyder, J. & Naas, J. (2006). The Development Methodology Of A Metropolitan Statistical Area Price Index Model, *Proceedings of the IBER & TLC.*

Muñoz, J. & Snyder, J. (2006). The Corporate Social Responsibility of Pure-Play Sites versus Brick-and-Mortar Corporations, *Proceedings of the MPMA Conference.*

Snyder, J. (2005). Evaluating E-Commerce: An Aesthetic Perspective, *Proceedings of the MPMA Conference.*

Reviewing Activities

Journal of Information Systems Education
Information Systems Education Journal
Information Systems Education Conference
Four Corners Conference on Globalization
Mountain Plains Management Conference

Invited or refereed talks/presentations to professional meetings

"Report on the National Collegiate Conference" May, 2013
    Mile High Chapter of the AITP Monthly Meeting; Denver, Colorado
    (Invited presentation including student presenters:
    Kaemen Chiles, Dustin Delor, and Michaela Ervin)

"Report on the National Collegiate Conference" May 2011
    Mile High Chapter of the AITP Monthly Meeting; Denver, Colorado
    (Invited presentation including student presenters: Cole Nash,
    Paul Ducray, Nathan Woods,)

"Wikipedia: Librarians Perspectives' on Its Use as a Reference Source"
    MPMC 2011, Grand Junction, Colorado, October 2011

"Report on the National Collegiate Conference"
    Mile High Chapter of the AITP Monthly Meeting; Denver, Colorado
    (Invited presentation including student presenters:
    Tristen Arisawa, Michael Ervin, Nathan Woods)

"Wikipedia as an Academic Reference: Faculty and Student Perspectives"
    AMCIS 2010, Lima, Peru, August 2010

"Wikipedia as an Academic Reference: Faculty Perspective"
    MPMA 2009, Grand Junction, Colorado, October 2009

"Cultural Dimensions of Web Design Elements"
    MPMA 2008, Pocatello, Idaho, October, 2008

"An Action Plan to Increase IS Enrollment Based on Recent Survey Evidence"
    ISECON 2008, Phoenix, Arizona, November, 2008

"Encouraging Students to Learn on the Fly in CIS Courses"
    ISECON 2008, Phoenix, Arizona, November, 2008

"Report on the National Collegiate Conference"
> Mile High Chapter of the AITP Monthly Meeting; Denver, Colorado, May, 2008
> **(Invited presentation including student presenters:**
> **Bill Jackson and Telicia Chaffin)**

"Using the National Collegiate Conference as a Student Chapter Focal Point"
> AITP National Collegiate Conference
> **(Invited presentation including student presenters:**
> **Bill Jackson and Telicia Chaffin)**
> Memphis, Tennessee, March, 2008

"Using the National Collegiate Conference as a Focal Point for an AITP Student Chapter's Annual Activities"
ISECON 2007, Pittsburgh, Pennsylvania, November, 2007
> "It's a Wiki-World: Utilizing Wikipedia as an Academic Reference"
Mountain Plains Management Association Annual Meeting
> University of Nebraska at Kearney, Kearney, Nebraska, October, 2007

"The National Collegiate Conference Team Experience"
> Mile High Chapter of the AITP Monthly Meeting; Denver, Colorado, May, 2007
> **(Invited presentation including student presenters:**
> **Bill Jackson, Jarrod Harper, and Telicia Chaffin)**

"The Corporate Social Responsibility of Pure-Play Sites versus Brick-and-Mortar
> Corporations" Mountain Plains Management Association Annual Meeting
> Utah Valley State College, Orem, Utah, October, 2006

"Evaluating E-commerce: An Aesthetic Perspective"
> Mountain Plains Management Association Annual Meeting
> Southern Utah University, Cedar City, Utah, October, 2005

"Partial Differential Equations and Population Models"
> Mathematical Association of America Regional Meeting
> Austin, Texas, April, 2000

"The Balloon Bifurcation"
> 1996 Region V Conference, Kappa Mu Epsilon, Mathematics
> Honor Society, Grand Junction, Colorado, April 21, 1996.

"A History of Population Models"
> Thirtieth Biennial Convention, Kappa Mu Epsilon,
> Mathematics Honor Society, Durango, Colorado, April 21, 1995.

"An Introduction to Dynamical Systems"
> 1994 Region V Conference, Kappa Mu Epsilon, Mathematics
> Honor Society, Albuquerque, New Mexico, April 9, 1994.

Professional Conferences:

Supercomputing
> April, 1991
Society of Mathematical Biologists Annual Meeting
> May, 1995

October Pre-service Conference for the Training of Teachers
    October, 1999
Mathematical Association of America Texas Section Meeting
    April, 2000; April 2002
Texas Association of Two Year Colleges Annual Meeting
    May, 2002
Mathematical Association of America Texas Section Meeting
    April, 2003
Dallascon – Wireless Security Conference
    May, 2004
Mountain Plains Management Association
    October, 2005; October 2006; October 2007; October 2008; October 2009;
    October 2011
National Collegiate Conference of the AITP (Faculty Sponsor)
    April, 2006; March 2007; March 2008; April 2009; March 2010; April 2011;
    April 2012, April 2013
DEFCON 14
    August, 2006
ISECON (Information Systems Educators Conference)
    November, 2007; November 2008
Americas Conference on Information Systems
    August, 2010
Four Corners Conference on Globalization
    October, 2010, 2011, 2013, 2013

Professional Affiliations:

AIS	Association of Information Systems
AITP	Association of Information Technology Professionals
EDSIG	AITP Education Special Interest Group
MPMA	Mountain Plains Management Association

Educational Activities:

Microsoft Certified Technology Associate Certificates
    Security (2013)
    Networking (2013)

Six Sigma Training
    Yellow Belt – July 6, 2009
    Green Belt – July 10, 2009
    Black Belt – June 10, 2010

Service to Profession:

Grant Writing Activities:

Date	Funding Agency	Status	Amount
Spring 2007	Vice-President of Academic Affairs, Mesa State College; Faculty Professional Development Fund	Awarded	$1,416.00
Spring 2009	Microsoft Corporation via Tech Soup Software Grant on Behalf of The Western Colorado Council of The Boy Scouts of America	Awarded	$3,600.00
Spring 2009	Vice-President of Academic Affairs, Mesa State College; Faculty Professional Development Fund	Awarded	$995.00
Fall 2009	El Pomar Foundation on Behalf of The Western Colorado Council of The Boy Scouts of America	Awarded	$25,000.00

Professional Service:

1991	Session Aide, Supercomputing Annual Meeting
1993	Session Aide Supervisor, American Physical Society Annual Meeting
1994	Referee, Math Presentations of Navajo Community College Science Honors Scholars
2000 - 04	Director and Judge, University Interscholastic League contest, computer applications competition, mathematics, calculator applications and number sense competitions
2004	Judge, Chihuahuan Desert Research Institute Annual Conference – Student paper and poster sessions
2008	Session Chair, Information Systems Educators Conference
2009	Track Chair, Mountain Plains Management Association Annual Conference, CIS Track
2010 -	Conference Organizing Committee, Four Corners Conference on Globalization, presenter, session chair
2010	Session Chair, AMCIS 2010 in Lima, Peru
2011	Track Chair, Mountain Plains Management Association Annual Conference, CIS Track
2010 - 2012	Faculty Advisory Board for the Student Leadership Council, Association of Information Technology Professionals

Fort Lewis College:

1987-88	Senior Class Vice-President
1988	Student Representative, Presidential Selection Committee

University of New Mexico:

1989-95	Student representative to the Graduate Student Association (GSA) from the mathematics department
1989-91	GSA representative to the campus planning committee
1989-93	GSA representative to the National Association of Graduate and Professional Students
1990-93	GSA representative to the student union board.
1992	Member, GSA evaluation task force
	President, GSA (Elected Position)
1992-93	Council Chair, GSA (Elected Position)
1993	Member, Student Union Building Director search committee
1997	Member, Mathematics Department Committee on Graduate Studies

Sul Ross State University:

1999-02	Member, Research and Development Council
	Secretary 2000-01, Chair 2001-02
1999	Chair, Computer Science Faculty Search Committee
2000-02	Member, Orientation Committee
2000-01	Member, Recruitment Issues Committee
2000	Member, Computer Services Committee
2001-02	Living/Learning Centers Committee
2001-02	Computer Information Systems Program Development Committee
2002	Chair, Mathematics Faculty Search Committee
2002	Financial Aid Appeals Committee
2002-04	Library Information Technology Council
	Secretary 2002-03, Chair 2003-05
2004-05	Chair, Dean of Arts and Sciences Search Committee
2005	Computer Information Systems Faculty Search Committee

Colorado Mesa University:

2005-06	Faculty Search Committee (CIS)
2005-08	Curriculum Advisory Board for Colorado Mountain College
2006-08	Faculty Search Committee (Finance)
2006 - 09	Recruitment, Advisement and Retention Committee
2007 -09	Luminis Web Portal Committee
2007-08	Web Content Committee
2007	Search Committee (Institutional Research Analyst)
2008-09	Distance Education Committee
2008 - 12	BOCA (Business Organizations, Clubs, and Associations) Committee
2009	Faculty Search Committee (Economics)
2010	Faculty Search Committee (Quantitative Methods/Management faculty)

2010 -	Academic Technology Advisory Committee
2010	Faculty Search Committee (Quantitative Methods/Management faculty)
2010	Faculty Search Committee (Human Resources/Entrepreneurship faculty)
2010	Search Committees (Instructional Designer and Digital Media Specialist)
2010	Learning Management System Evaluation Committee
2010	Graduate Bulletin Working Group
2010 - 14	Organizing Committee, Four Corners Conference on Globalization
2011	Pre-Tenure Committee
2011	Search Committee (Quantitative Methods/Management faculty)
2011 - 12	Web/Marketing Committee
2011 - 13	MBA Committee
2011 - 13	Higher Learning Commission Re-accreditation Committee; Criterion One
2013 - 15	Search Committee (Computer Science, two positions; Computer Information Systems)
2012 -	Faculty Senate (Vice-President 2013-2015)

Community:

1977	Eagle Boy Scout
1977-81	Member, National Ski Patrol
1979-81	Captain, Junior National Ski Patrol
1983-87	Member, Board of Directors, Durango Natural Foods
1986-87	Secretary to the Board of Directors, Durango Natural Foods
1986-88	Disk Jockey, KDUR 91.9 FM, student managed radio, Fort Lewis College
1996	Judge, Garfield Middle School Science Fair
1995-97	Volunteer, Explora! Science Center
1999	Judge, Northwest Science Exposition
2001	Eagle Scout Review Board Member
2003	Judge, Marathon ISD Science Fair
2003	Guest Presenter, Alpine High School
2004	Alpine High School Site Based Decision Making Committee
2004	Alpine High School Vertical Curriculum Alignment Committee
2007	Guest Presenter, Fruita 8/9 School (The History of Numbers and $\sqrt{-1}$; The Fractal Dimension)
2008 - 10	Member, Executive Council for the Western Colorado Council of the Boy Scouts of America
2009 - 10	Council Vice-President for Membership and Relations, Western Colorado Council of the Boy Scouts of America
2010 - 12	Faculty Advisor to the Association of Information Technology Professionals Student Leadership Council (National Level Position)
2010 -	Member, Board of Directors, Little Mavericks Learning Center

Administration, Curricular Development:

Co-organizer for the New Mexico JUMP (JUnior Mathematics Prognosis) Project:
This was a project which promoted mathematics awareness in public school systems throughout New Mexico. During the time of my involvement the exams were updated, the grading and reporting process was computerized using Scantron forms and Scanform software, and teacher suggestions were incorporated into the examination and reporting processes, as well as into the statistical analysis. Throughout my involvement with this program, many of the teachers in the Albuquerque area invited me to give lectures about the applications of mathematics to their classes which helped them illustrate the importance of mathematics to their students. (1990-92)

Mathematics instructor for the TRIBES Summer Program, Native American Program College of Engineering (NAPCOE):
This was a bridge program for Native American students from throughout North America. As the mathematics instructor I was responsible for curriculum development and implementation. As a part of the program staff, I helped organize activities and set standards for the students. I acted as a mentor to the students, and attended training sessions such as "Imaginal Education for Mathematics and Science Educators," and "Facilitation Methods." (1994)

Mathematics instructor at Phillips Academy in Andover, Massachusetts:
During this summer program, I supervised a male dormitory, taught a physical education class and developed and instructed a class in Mathematical Modeling. Topics covered included dimensional analysis, traffic flow problems, the mathematics of pool, fractals, and population mathematics from both a discrete and a continuous perspective. (1995)

Distance Education Curriculum Development, University of New Mexico:
I was involved with the Department of Continuing Education at the University of New Mexico revising the course curriculum for correspondence classes. This project involved putting together a syllabus for students around the state (and elsewhere) to follow. These syllabi include homework assignments, practice exams, and an outline for success in correspondence coursework. The course sequences that I revised, developed, and supervised were the algebra sequence (M120, M121, and M150), the elementary education sequence (M111, M112, and M215), and the calculus for life and economic sciences (M180 and M181). (1996-1999)

Curriculum Development at Pacific University:
In conjunction with departmental members, I helped to re-write the mathematics curriculum at Pacific University. One of my primary roles was to develop an applied course in partial differential equations which was accepted as a service course by the physics, chemistry, mathematics and computer science departments at Pacific University. (1998-99)

Course development at Sul Ross State University:
I developed both service courses and courses for math majors that were incorporated into the permanent curriculum. These included Statistics (Math 1342), Numerical Analysis (Math 3306), Computing in Mathematics (Math 3306) and a yearlong sequence in Complex Variables (Math 4360 and Math 4361). (1999-2002)

Mathematics Instructor for the PASS (Program for Academic Success and Socialization) Program at Sul Ross State University:

I taught a two week course every summer to students who had just graduated high school and were enrolling in Sul Ross State University for the fall semester. This was a "bridge" program designed to give these students (primarily first generation college students) an advantage to ensure their success in university studies. We reviewed the basics of algebra and geometry as well as introducing good study habits which included note taking and textbook marking. For some of the students, this was a primer for college algebra or statistics, while for others it is a review for the TASP exam, an examination administered by the state of Texas for entrance into university studies. In addition to the mathematics, we had some fun with scavenger hunts and jeopardy; all having a mathematical or scientific orientation. (1999 - 2004)

Mathematics Instructor for the Upward Bound program at Sul Ross State University:

I taught a summer program to junior and senior high school students who were active in the Upward Bound Program. Topics included soil composition analysis, Voronoi diagrams and regions of influence, graph theory, and geometry. (2000)

Distance Education at Sul Ross State University:

I taught classes that were televised to area high schools for dual credit (high school credit and university credit). Typically I taught college algebra or calculus each academic year. (1999 – 2005)

Curriculum Development at Sul Ross State University:

I was a key committee member for the development of a BBA degree in Computer Information Systems (CIS). This committee established curriculum requirements and financial need analysis for the new degree. (2001)

I organized and ran the computer science and mathematics department seminar. In this forum, faculty and students presented ideas from mathematics and computer science that they found interesting. One of the main focal points of the department was the training of pre-service teachers, so this forum provided a chance for the students to "get their feet wet" via presentations in this "safe" environment. Each student enrolled in the seminar was required to present two, twenty minute talks during the semester. (2001 - 2005)

I developed the CIS degree program, insuring that prerequisite classes were taught in a timely manner, obtained and maintained the computer hardware and software infrastructure, directed library acquisitions and advised CIS majors. (2003 – 2005)

Chairman Department of Computer Science and Mathematics:

As the Chair of the department, I was responsible for the oversight of the annual budget, the coordination of class offerings, and the supervision of five faculty, multiple adjunct faculty, and one staff member. Additional duties included aligning our curriculum with the Academic Center for Excellence (remediation programs), working on the English Language Learners Grant in conjunction with the department of Education, and coordinating the mathematics program to align with statewide educator standards.

Faculty Advisor, Colorado Mesa University Association of Information Technology Professionals (AITP) Student Chapter:

As the faculty advisor, it is my job to generate synergy within the organization. This has been accomplished by making the National Collegiate Convention (NCC) a "target point" for the academic year. This focus enables the monthly meetings to have a theme such as "usability analysis" or "PC troubleshooting" as a fun and educational interlude to the regular agenda items. The student chapter began a computer diagnosis and repair fundraising activity, "The Computer Heroes." This activity gives students PC trouble shooting skills, customer relationship skills, and user support skills. This activity also enables the students to gain practical experience while they pursue their degrees, building their resumes. These activities have resulted in many of the AITP student chapter members participating in NCC events and bringing awards (as well as having a valuable learning experience) to Colorado Mesa University. These activities have also facilitated student presentations in the "Student Scholars Symposium" at Colorado Mesa University, presentations to the sponsoring chapter, the Mile High Chapter of the AITP in Denver, Colorado, and presentations at the National Collegiate Conference sponsored by the AITP. As an interface with our parent chapter in Denver, I travel with students approximately once per semester to a monthly meeting of the AITP in Denver which gives the students exposure to working professionals in the IT field, allows the students to practice networking within the professional field, and gives the students ideas as to what the IT community values in "new employees" before they graduate and pursue careers. (2005 – present)

Distance Education, Colorado Mesa University:

As a regional service provider, Colorado Mesa University has a need for professors to accommodate distance students. I teach classes using WebCT for online classes and distance delivery methods (two way interactive television) for our remote campus students in Montrose, Colorado. (2006 – present)

Portal Launch/Web Content Redesign, Colorado Mesa University:

As a committee member for the Luminis Portal and the Web Content committees my academic affiliation (computer information systems) was utilized to format the portal pages for both usability and content. Further, my expertise was useful for the redesign of the business department web pages, which I was responsible for. In addition to the design component for my department, I consulted with various other departments for their design and acted as a change manager for the faculty contingent in the adoption of the portal and the web redesign. This committee met during the summer of 2007 to accomplish the roll-out by the fall semester of 2007. (2007 – 2009)

Faculty and Staff Training, Office 2007, Colorado Mesa University:

I was asked to perform training on the new office software package immediately after a campus-wide conversion to Office 2007 by the Office of the Vice-President of Academic Affairs. Incorporated into this training was an element of "change management," as many on the faculty and staff were leery of the transition. I ran two different training sessions, one for staff where tools such as mail merge and basic formula creation were addressed (Word and Excel) and one for faculty where creation of an automated table of contents, citation and reference list creation, creation of a grade book application, and presentation skills/tools were addressed

(Word, Excel, and PowerPoint). The change management came about by informing the users as to the reasons behind the changed interface, its usability and its utility for their job performance. In addition, many of the new customization tools, the help menu, and online help resources were addressed. (Summer and Fall, 2008)

Software Proficiencies:

Programming: Fortran, Pascal, VRML, Java, VBA
Operating Systems: Windows, Mac, UNIX, LINUX, Dos
Software: Word Processor, PowerPoint, Spreadsheet, SPSS, Stat View, PhasePlane,
   LocBif, GIS, Oracle/SQL …
Distance Education: Experience with WebCT, Desire2Learn, and Blackboard,   Instructional Television Courses, Correspondence Courses

Professional Recognition:

Charter member, Kappa Mu Epsilon, Colorado Gamma Chapter
  Treasurer, 1985-86
  President, 1986-88

Math Department Scholarship, Spring 1987, Fort Lewis College
This scholarship recognizes scholarly achievement, and is a monetary award for the following academic year.

First Place Award, Spring 1994, Kappa Mu Epsilon Regional Convention, University of New Mexico; This monetary award recognizes the best presentation (graduate category) of the meeting.

Member, Kappa Mu Epsilon, New Mexico Alpha Chapter
  Treasurer, 1995-96

Texas NEXT (New EXperiences in Teaching) Fellow, 2000

Who's Who in American Colleges and Universities, 1993

Who's Who in America, 2003

Who's Who Among America's Teachers, 2002 (Nominated by Ana M. Perez)
Who's Who Among America's Teachers, 2004 (Nominated by Alfonso Chavez Jr.)
Who's Who Among America's Teachers, 2005 (Nominated by Wesley Culver)
Who's Who Among America's Teachers, 2005 (Nominated by Johnny Mendias)
Who's Who in American Education, 2006, 2007, 2008

Meritorious Paper Award, ISECON 2006

Faculty "Extra Mile Award" Association of Information Technology Professionals
   Awarded at the National Collegiate Conference, March, 2008

Outstanding Educator Award, Presented by the Grand Junction Chamber of Commerce   and the
Student Government Association of Mesa State College, May, 2008

Best Paper Award, Pedagogy Track, MPMC October, 2009

Best Paper Award, Pedagogy Track, MPMC October, 2011

Distinguished Paper Award, ISECON 2013

Nominated by a peer faculty member for Distinguished Faculty Award, 2013-2014

Appendix B

CIS Program Curriculum Map to the IS 2002 National Curricular Model

Center for Computing Education Research

A Division of the Institute for Certification of Computing Professionals Education Foundation

Curriculum: IS 2002 By Learning Unit By Local Objectives

Mesa State College

IS . 0 Personal Productivity with IS Technology (Prerequisite: elementary knowledge of word processing, spread

		Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
Distinct LUs Covered:	22				
LU	**LU Title**				
1	**Systems and IT Concepts**				
CISB 210	Fundamentals of Information Systems				
		0	0	1	0

CISB 101	Business Information Technology				
		1	0	0	0

1. describe and explain in systems terms the hardware and software components of a computer system
2. describe, explain and use an operating system and user interface to install and operate programs, define and protect data files, and perform operating system utility functions

13.1   **Work and activity concepts**

CISB 210	Fundamentals of Information Systems				
		0	1	0	0

1.   define and explain the concept of knowledge work
compare and contrast data, information and knowledge
3.   describe knowledge work activity; identify and explain methods for achieving productivity in knowledge work

CISB 101   Business Information Technology

| | 1 | 0 | 0 | 0 |

1.   define and explain the concept of knowledge work
2. compare and contrast data, information and knowledge
3.   describe knowledge work activity; identify and explain methods for achieving productivity in knowledge   work

13.2   Support: individuals vs groups

CISB 210   Fundamentals of Information Systems

| | 0 | 1 | 0 | 0 |

Explain the potential problems of end-user developeds systems.

CISB 101   Business Information Technology

| | 1 | 0 | 0 | 0 |

1.   compare and contrast application planning, development, and risk management for personal vs organizational information systems
2. explain potential problems of user developed systems

CISB 392   Information Systems Theory and Practice

| | 0 | 1 | 0 | 0 |

1.   compare and contrast application planning, development, and risk management for personal vs organizational information systems
2. explain potential problems of user developed systems

13.3   Info analysis: individual vs group

CISB 205   Advanced Business Software

| | 0 | 1 | 0 | 0 |

1.   describe and explain individual vs group technology; explain the additional processing and other issues and needs necessitated by working in a group
2. describe and explain group support technology for common knowledge requirements
3. describe and explain the process of information ...

CISB 210   Fundamentals of Information Systems

| | 0 | 1 | 0 | 0 |

1.   describe and explain individual vs group technology; explain the additional processing and other issues and needs necessitated by working in a group
2. describe and explain group support technology for common knowledge requirements
3. describe and explain the process of information ...

13.4   Info analysis: finding is/it requirements

CISB 101	Business Information Technology	1	0	0	0

1.   describe and explain characteristics and attributes of knowledge work for individuals and groups
2. discuss and explain knowledge building and maintaining tasks
3. use questions to elicit systematically and identify data requirements from individuals and

CISB 210	Fundamentals of Information Systems	0	1	0	0

1.   describe and explain characteristics and attributes of knowledge work for individuals and groups
2. discuss and explain knowledge building and maintaining tasks
3. use questions to elicit systematically and identify data requirements from individuals and

CISB 442	Systems Analysis and Design	0	0	0	1

1.   describe and explain characteristics and attributes of knowledge work for individuals and groups
2. discuss and explain knowledge building and maintaining tasks
3. use questions to elicit systematically and identify data requirements from individuals and

13.5   Organizing personal data resources

CISB 101	Business Information Technology	1	0	0	0

1.   given knowledge work tasks and activities, design and implement an approach to directory organization and file naming that will support retention and access to data
2. list principles that apply to software acquisition and upgrades
3. describe approaches for transferring data among apps ...

CISB 205	Advanced Business Software	0	1	0	0

1.   given knowledge work tasks and activities, design and implement an approach to directory organization and file naming that will support retention and access to data
2. list principles that apply to software acquisition and upgrades
3. describe approaches for transferring data among apps ...

CISB 210	Fundamentals of Information Systems	0	0	1	0

1.   given knowledge work tasks and activities, design and implement an approach to directory organization and file naming that will support retention and access to data
2. list principles that apply to software acquisition and upgrades
3. describe approaches for transferring data among apps ...

13.6 Database terminology and concepts

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. describe and explain the terminology and use of relational databases
2. describe and explain concepts necessary to access organizational databases
3. use a database access facility to query data from an organizational repository

CISB 392   Information Systems Theory and Practice

0	0	1	0

1. describe and explain the terminology and use of relational databases
2. describe and explain concepts necessary to access organizational databases
3. use a database access facility to query data from an organizational repository

CISB 451   Database Administration

0	0	0	1

1. describe and explain the terminology and use of relational databases
2. describe and explain concepts necessary to access organizational databases
3. use a database access facility to query data from an organizational repository

CISB 205   Advanced Business Software

0	0	1	0

1. describe and explain the terminology and use of relational databases
2. describe and explain concepts necessary to access organizational databases
3. use a database access facility to query data from an organizational repository

13.7 Accessing/retrieving/storing data

CISB 210   Fundamentals of Information Systems

0	0	1	0

Locate and access external sources of information using available internet tools.

CISB 392   Information Systems Theory and Practice

0	0	0	1

1. define and discuss external information resources; identify source, content, cost and timeliness
2. locate and access external information resources using available internet tools: browsers, search, ftp

13.8   Is life cycle: developing with packages

CISB 210   Fundamentals of Information Systems

Discuss the concept of an information systems life cycle.

0	1	0	0

CISB 442   Systems Analysis and Design

0	0	0	1

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

CISB 392   Information Systems Theory and Practice

0	1	0	0

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

CISB 400   Data Communications and Network Management

1	0	0	0

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

CISB 451   Database Administration

0	1	0	0

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

CISB 471   Advanced Information Systems

0	0	1	0

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

CISB 460/56 Electronic Commerce Systems

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

CISB 331   Advanced Business Programming

0	0	1	0

1.   discuss the concept an information systems life cycle
2.   identify and explain criteria to decide between acquisition of software packages vs custom development of software

13.9   Configure and customize a package

CISB 205   Advanced Business Software

0	0	1	0

Access technical information provided in a help facility.

CISB 101   Business Information Technology

1	0	0	0

1.   install and customize a general purpose software package to provide specific functionality beyond the default settings
2.   add capability to a software system by recording and storing a macro in the library of the given software package

CISB 210   Fundamentals of Information Systems

0	0	1	0

1.   install and customize a general purpose software package to provide specific functionality beyond the default settings
2.   add capability to a software system by recording and storing a macro in the library of the given software package

13.1   Procedural/event driven programming

CISB 210   Fundamentals of Information Systems

0	1	0	0

Compare and contrast procedural and non-procedural programming languages.

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

0	0	0	1

1.   discuss and explain the concepts of data and procedural representation, programming languages, compilers and interpreters, development environments, and event-driven graphical user interfaces
2. compare, relate, and explain concepts of structured, event-driven, object oriented

13.11 Implementing simple algorithms

CISB 331	Advanced Business Programming				
Design and implement program logic using graphical technique utilizing sequence, iteration and selection		0	0	0	1

CISB 305	Solving Problems Using Spreadsheets and Statistical Software				
Design program logic using pseudocode that utilizes standard control structures: sequentce, iteration and selection.		0	0	0	1

CISB 210	Fundamentals of Information Systems				
		0	1	0	0

1.	state a simple problem identifying desired outputs for given inputs; give an overview of the problem
2. describe fundamental data types and their operation
3. design program logic using both graphical and pseudocode techniques which utilize

CISB 205	Advanced Business Software				
		0	1	0	0

1.	state a simple problem identifying desired outputs for given inputs; give an overview of the problem
2. describe fundamental data types and their operation
3. design program logic using both graphical and pseudocode techniques which utilize

13.12 Implementing a simple database design

CISB 205	Advanced Business Software				
Explain tables, relationships, and relational integrity.		0	0	1	0

CISB 101	Business Information Technology				
		0	0	1	0

1.	describe and explain tables, relations, referential integrity, and the concepts of normal forms
2.	from a workflow drawing or other requirements documents, derive a simple multi-table database design
3. using a relational database software package, implement and populate tables; develop ...

CISB 451   Database Administration

0	0	0	1

1.   describe and explain tables, relations, referential integrity, and the concepts of normal forms
2.   from a workflow drawing or other requirements documents, derive a simple multi-table database design
3. using a relational database software package, implement and populate tables; develop ...

13.13   Implementing and event driven applications

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

0	0	1	0

1.   apply a GUI event-driven solution in a development environment
2.   build a simple application form with several objects (e.g. label, field edit box, list box, radio button, command button)

CISB 101   Business Information Technology

1	0	0	0

1.   apply a GUI event-driven solution in a development environment
2.   build a simple application form with several objects (e.g. label, field edit box, list box, radio button, command button)

CISB 205   Advanced Business Software

1	0	0	0

1.   apply a GUI event-driven solution in a development environment
2.   build a simple application form with several objects (e.g. label, field edit box, list box, radio button, command button)

CISB 331   Advanced Business Programming

1	0	0	0

1. apply a GUI event-driven solution in a development environment
2. build a simple application form with several objects (e.g. label, field edit box, list box, radio button, command button)

13.14   IS Development with Prototyping

CISB 442   Systems Analysis and Design

0	0	0	1

Modify inputs, outputs and user interfaces to refine a prototype created and judged by clients.

CISB 205   Advanced Business Software

1. compare capabilities of an application with the requirements it is intended to meet
2. identify alternative outcomes of the process of application verification
3. evaluate and define the results and probabilities of errors in prototyped application software
4. modify inputs, outputs ...

		0	0	1	0

CISB 210   Fundamentals of Information Systems

1. compare capabilities of an application with the requirements it is intended to meet
2. identify alternative outcomes of the process of application verification
3. evaluate and define the results and probabilities of errors in prototyped application software
4. modify inputs, outputs ...

		0	0	0	1

CISB 331   Advanced Business Programming

1. compare capabilities of an application with the requirements it is intended to meet
2. identify alternative outcomes of the process of application verification
3. evaluate and define the results and probabilities of errors in prototyped application software
4. modify inputs, outputs and processing to refine a prototype

		0	0	0	1

IS Technology Evolution

CISB 392   Information Systems Theory and Practice

Identify the drives of change in information technology.

		1	0	0	0

CISB 101   Business Information Technology

1.   list and explain technologies and their relevance to individual information technology
2.   given a technology, explain its importance to future developments and to future knowledge worker productivity
3. identify drivers and inhibitors of change in information technology

		1	0	0	0

CISB 260   Information Systems Architecture

1.   list and explain technologies and their relevance to individual information technology
2.   given a technology, explain its importance to future developments and to future knowledge worker productivity
3. identify drivers and inhibitors of change in information technology

		0	0	0	1

CISB 400   Data Communications and Network Management

0	0	1	0

1.   list and explain technologies and their relevance to individual information technology
2.   given a technology, explain its importance to future developments and to future knowledge worker productivity
3. identify drivers and inhibitors of change in information technology

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. list and explain technologies and their relevance to individual information technology
2. given a technology, explain its importance to future developments and to future knowledge worker productivity
3. identify drivers and inhibitors of change in information technology

13.16   Implementing a personal is application

CISB 205   Advanced Business Software

0	0	1	0

1.   analyze, design, develop and use packages and/or high level database languages to implement workable solutions that solve an information systems problem associated with knowledge work activities
2. assess the increased productivity realized by implementation of personal systems

CISB 210   Fundamentals of Information Systems

0	0	0	1

1.   analyze, design, develop and use packages and/or high level database languages to implement workable solutions that solve an information systems problem associated with knowledge work activities
2. assess the increased productivity realized by implementation of personal systems

CISB 451   Database Administration

0	0	0	1

1.   analyze, design, develop and use packages and/or high level database languages to implement workable solutions that solve an information systems problem associated with knowledge work activities
2. assess the increased productivity realized by implementation of personal systems

14   Problem Solving, with Packages

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   explain and use concepts of formal problems and software engineering as applied developing effective solutions which enhance personal productivity involving knowledge work activities, wherein solutions are compatible with the organizational information system
2. develop, document, and ...

CISB 392   Information Systems Theory and Practice

0	0	1	0

1.   explain and use concepts of formal problems and software engineering as applied developing effective solutions which enhance personal productivity involving knowledge work activities, wherein solutions are compatible with the organizational information system
2. develop, document, and ...

CISB 442   Systems Analysis and Design

0	0	1	0

1.   explain and use concepts of formal problems and software engineering as applied developing effective solutions which enhance personal productivity involving knowledge work activities, wherein solutions are compatible with the organizational information system
2. develop, document, and ...

CISB 331   Advanced Business Programming

0	0	0	1

1.   explain and use concepts of formal problems and software engineering as applied developing effective solutions involving knowledge work activities, wherein solutions are compatible with the organizational information system
2. develop,   document, and ...

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

0	0	0	1

1.   explain and use concepts of formal problems and software engineering as applied developing effective solutions which enhance personal productivity involving knowledge work activities, wherein solutions are compatible with the organizational information system
2. develop, document, and ...

CISB 101   Business Information Technology

1	0	0	0

1.   explain and use concepts of formal problems and software engineering as applied developing effective solutions which enhance personal productivity involving knowledge work activities, wherein solutions are compatible with the organizational information system
2. develop, document, and ...

15   Information Use Strategies

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   explain data administration and access to corporate and alternate information resources
2.   intelligently discuss the differences between managing IS&T, IRM, Systems Development, Systems Maintenance, Systems Operations

CISB 392   Information Systems Theory and Practice   0   0   1   0

1.   explain data administration and access to corporate and alternate information resources
2.   intelligently discuss the differences between managing IS&T, IRM, Systems Development, Systems Maintenance, Systems Operations

CISB 442   Systems Analysis and Design   0   0   0   1

1.   explain data administration and access to corporate and alternate information resources
2.   intelligently discuss the differences between managing IS&T, IRM, Systems Development, Systems Maintenance, Systems Operations

CISB 331   Advanced Business Programming   1   0   0   0

1. explain data administration and access to corporate and alternate information resources
2. intelligently discuss the differences between managing IT Systems Development, Systems Maintenance, Systems Operations

Knowledge Work Software

CISB 101   Business Information Technology   0   0   1   0

1.   design, develop and use a simple database; import a spread sheet into the database; export a database table (or spread- sheet) to a word processing package for use in a report
2.   implement a "slide show" presentation in a presentation graphics package to communicate a problem and ...

CISB 205   Advanced Business Software   0   0   0   1

1.   design, develop and use a simple database; import a spread sheet into the database; export a database table (or spread- sheet) to a word processing package for use in a report
2.   implement a "slide show" presentation in a presentation graphics package to communicate a problem and ...

CISB 331   Advanced Business Programming   3   **Problem Solving, Small IS**

2. implement a "slide show" presentation in a presentation graphics package to communicate a problem and its solution, and a hand-out for an attending audience

CISB 205   Advanced Business Software   0   0   1   0

1.   describe, explain and use a systems approach definition and implementation of PC based solutions using knowledge work software to improve personal productivity, increase knowledge ...

CISB 210   Fundamentals of Information Systems   0   0   0   1

1. describe, explain and use a systems approach definition and implementation of PC based solutions using knowledge work software to improve personal productivity, increase knowledge ...

4 IT and Society

CISB 101   Business Information Technology   0   1   0   0

1. describe and explain the relevance and impact of information technology on society
2. explain the role of information systems within a company versus a global environment

CISB 205   Advanced Business Software   0   1   0   0

1. describe and explain the relevance and impact of information technology on society
2. explain the role of information systems within a company versus a global environment

CISB 460/56 Electronic Commerce Systems   0   1   0   0

1. describe and explain the relevance and impact of information technology on society
2. explain the role of information systems within a company versus a global environment

CISB 210   Fundamentals of Information Systems   0   0   0   1

1. describe and explain the relevance and impact of information technology on society
2. explain the role of information systems within a company versus a global environment

Distinct LUs Covered:	9	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
LU	LU Title				

10   Characteristics of an IS Professional

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   discuss and explain the concepts of individual decision making and achievement; explain the requirement of personal decision making in empowerment in a work setting

CISB 392   Information Systems Theory and Practice

0	0	1	0

1. discuss and explain the concepts of goal setting and individual decision making and achievement; explain the requirement of goal setting and personal decision making in empowerment in a work setting

11   IS Careers

CISB 210   Fundamentals of Information Systems

Describe the characteristics of IS career paths.

0	1	0	0

CISB 101   Business Information Technology

identify and explain telecommunications careers and career paths

1	0	0	0

CISB 451   Database Administration

1. identify and explain telecommunications careers and career paths

0	1	0	0

CISB 442   Systems Analysis and Design

0	1	0	0

1. identify and explain telecommunications careers and career paths

12   Ethics and the IS Professional

CISB 210   Fundamentals of Information Systems

0	1	0	0

Identify the ethical responsibilities of the IS practitioner.

CISB 101   Business Information Technology

1	0	0	0

1.   use professional code of ethics to evaluate specific IS actions
2.   describe ethical and legal issues; discuss and explain ethical considerations of software usage, sales, distribution, operation and maintenance

CISB 392   Information Systems Theory and Practice

0	0	0	1

1.   use professional code of ethics to evaluate specific IS actions
2.   describe ethical and legal issues; discuss and explain ethical considerations of software usage, sales, distribution, operation and maintenance

13   IS Personal Level Systems

CISB 101   Business Information Technology

0	0	1	0

1.   analyze, design, develop and use packages (e.g. a statistics and or high level data management package) and/or high level database requiring languages to implement workable solutions which solve an information systems problem associated with knowledge work activities

CISB 205   Advanced Business Software

0	0	1	0

1.   analyze, design, develop and use packages (e.g. a statistics and or high level data management package) and/or high level database requiring languages to implement workable solutions which solve an information systems problem associated with knowledge work activities
2. assess ...

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

    1.   analyze, design, develop and use packages (e.g. a statistics and or high level data management package) and/or high level database requiring languages to implement workable solutions which solve an information systems problem associated with knowledge work activities

2. assess ...

0	0	0	1

5   Systems and Quality

CISB 210   Fundamentals of Information Systems

1. explain systems theory and quality concepts

0	0	1	0

CISB 392   Information Systems Theory and Practice

    1. explain systems theory and quality concepts

0	0	0	1

CISB 451   Database Administration

1. explain systems theory and quality concepts

0	1	0	0

6   Information and Quality

CISB 210   Fundamentals of Information Systems

1. explain methodologies to facilitate measurements to achievement quality standards

0	1	0	0

CISB 392   Information Systems Theory and Practice

1. explain methodologies to facilitate measurements to achievement quality standards

0	0	1	0

7   IT Hardware and Software

CISB 210   Fundamentals of Information Systems

Explain system components and their relationships.

0	1	0	0

CISB 101   Business Information Technology

1.   explain the elements and functional relationships of major hardware, software, and communications elements of information systems consisting of single PCS, LANs and/or WANs

1	0	0	0

CISB 392   Information Systems Theory and Practice

1. explain the elements and functional relationships of major hardware, software, and communications elements of information systems consisting of single PCS, LANs and/or WANs

0	1	0	0

CISB 260   Information Systems Architecture

1. explain the elements and functional relationships of major hardware, software, and communications elements of information systems consisting of single PCS, LANs and/or WANs

0	0	0	1

CISB 400   Data Communications and Network Management

1. explain the elements and functional relationships of major hardware, software, and communications elements of information systems consisting of single PCS, LANs and/or WANs

0	0	0	1

8   IT Systems Specification

CISB 210   Fundamentals of Information Systems

1.   explain the concepts of implementing IS coupled to re-engineering and continuous improvement

0	0	1	0

CISB 471   Advanced Information Systems

1. explain the concepts of implementing IS coupled to re-engineering and continuous improvement

CISB 471: 0   0   0   1

9   IT and Attaining Objectives

CISB 210   Fundamentals of Information Systems

explain the relevance of IS management aligning itself with strategic organizational processes

CISB 210: 0   0   1   0

CISB 392   Information Systems Theory and Practice

1. explain the relevance of IS management aligning itself with strategic organizational processes

CISB 392: 0   1   0   0

CISB 460/56 Electronic Commerce Systems

1. explain the relevance of IS management aligning itself with strategic organizational processes

CISB 460/56: 0   1   0   0

CISB 451   Database Administration

1. explain the relevance of IS management aligning itself with strategic organizational processes

CISB 451: 0   1   0   0

IS . 2   Electronic Business Strategy, Architecture and Design

Distinct LUs Covered: 9

LU	LU Title	200 Evolution of IT use	Level 1 Recognize	Level 2 Differe ntiate	Level 3 Use

Local Objectives

CISB 460/56 Electronic Commerce Systems

0	1	0	0

    1.   compare and distinguish between previous and evolving methods for developing products and services, exchanging these in the marketplace
2. identify and explain the impact of internet technologies on the evolution of organizations
3. identify and distinguish value and supply chain characteri

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. compare and distinguish between previous and evolving methods for developing products and services, exchanging these in the marketplace
2. identify and explain the impact of internet technologies on the evolution of organizations
3. identify and distinguish value and supply chain characteristics as influenced by internet

201   E-commerce relationship types

CISB 460/56 Electronic Commerce Systems

0	1	0	0

    1.   identify, compare, and contrast the nature of relationships between customer, business, and government
    2.   give a systems view of traditional versus information technology intensive explanations for the evolution of business relationships

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. identify, compare, and contrast the nature of relationships between customer, business, and government

202   Value and Supply chain concepts

CISB 460/56 Electronic Commerce Systems

0	1	0	0

    1.   illustrate the value chain hypothesis and identify components developed in various business relationships
2. describe how the value change is analyzed in developing new business implementations
3. illustrate the application of information technology in measuring elements of the value chain

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. illustrate the value chain hypothesis and identify components developed in various business relationships
2. describe how the value change is analyzed in developing new business implementations
3. illustrate the application of information technology in measuring elements of the value chain

CISB 460/56 Electronic Commerce Systems

0	1	0	0

1.   discuss and explain shopping carts, catalog presentation, inventory management and supply change coordination
2. discuss human computer interface issues that impact shopping cart effectiveness
3. discuss customer preference and intelligent recommending systems

CISB 210   Fundamentals of Information Systems

1	0	0	0

3. discuss customer preference and intelligent recommending systems

---

204   E-commerce functonality

CISB 460/56 Electronic Commerce Systems

0	0	1	0

1. identify specific business relationships, for example, EBay (C2C), Yahoo(portal), GeoCities(virtual community), E-trade (securities exchange), then list, describe and explain functionality for each site type
2. identify and discuss several shopping sites, information providers, map systems, sec

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. identify specific business relationships, for example, EBay (C2C), Yahoo(portal), GeoCities(virtual community), E-trade (securities exchange), then list, describe and explain functionality for each site type

---

205   Interorganizational Ethical Issues

CISB 460/56 Electronic Commerce Systems

1	0	0	0

1.   identify and explain legal systems governing inter-organizational relationships and transactions
2. identify ethical considerations including sales, service, and information sharing arrangements
3. identify and explain relevant cases involving B2C, B2B, and C2C interactions

CISB 210   Fundamentals of Information Systems

1	0	0	0

3. identify and explain relevant cases involving B2C, B2B, and C2C interactions

206   Hardware/Software Inter-organizational System

CISB 460/56 Electronic Commerce Systems

                                 1   0   0   0

1.   explain the hardware components required to implement inter-organizational systems including computers, communication equipment, and transmission media
2.   discuss and illustrate the concept of layer systems architectures and give examples of the ISO and similar models which support internet tr

207   Inter-organizational IS Development Methodologies

CISB 460/56 Electronic Commerce Systems

                                 1   0   0   0

1.   describe and explain the goals and responsibilities of inter-organizationl systems
2.   explain the use of steering teams in the direction and control of inter-organizational business systems
describe the relationships of evolving business models and systems in the planing process for

208   Individual Privacy Concerns

CISB 460/56 Electronic Commerce Systems

                                 1   0   0   0

explain the roles of codes of ethics of the ACM, AITP and other similar organizations
explain and discuss laws regarding the privacy of individuals data
discuss the concepts of security risks and the impact on individuals and organizations
explain the concept of privacy of email,

CISB 210   Fundamentals of Information Systems

                                 1   0   0   0

2. explain and discuss laws regarding the privacy of individuals data
4. explain the concept of privacy of email, electronic transactions, and other exchanges

IS . 3   Information Systems Theory and Practice

Distinct LUs Covered: 18

LU	LU Title	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
119	Ethics and Legal Issues				

Local Objectives

CISB 392   Information Systems Theory and Practice

0	0	1	0

1.   list and explain ethical and legal issues in development, ownership, sales, acquisition, use and maintenance of computer systems and software
2. explain the utilization of ethical models, e.g. principle centered leadership to IS life cycle stages

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   list and explain ethical and legal issues in development, ownership, sales, acquisition, use and maintenance of computer systems and software
2.   explain the utilization of ethical models, e.g. principle centered leadership to IS life cycle stages

CISB 460/56 Electronic Commerce Systems

1	0	0	0

1.   list and explain ethical and legal issues in development, ownership, sales, acquisition, use and maintenance of computer systems and software
2.   explain the utilization of ethical models, e.g. principle centered leadership to IS life cycle stages

CISB 471   Advanced Information Systems

0	1	0	0

1.   list and explain ethical and legal issues in development, ownership, sales, acquisition, use and maintenance of computer systems and software
2.   explain the utilization of ethical models, e.g. principle centered leadership to IS life cycle stages

CISB 400   Data Communications and Network Management

1	0	0	0

1.   list and explain ethical and legal issues in development, ownership, sales, acquisition, use and maintenance of computer systems and software
2.   explain the utilization of ethical models, e.g. principle centered leadership to IS life cycle stages

123   IS Management of IS Function

CISB 392   Information Systems Theory and Practice

0	1	0	0

Idenfity and suggest appropriate responses to managerial and organizational issues stemming from development, implementation, and use of computer-based information systems.

CISB 210   Fundamentals of Information Systems
    1. explain security and privacy issues

0	1	0	0

CISB 400   Data Communications and Network Management

1. explain security and privacy issues
2. explain the basis for a legal contract to develop systems

0	1	0	0

CISB 471   Advanced Information Systems

1. explain security and privacy issues
2. explain the basis for a legal contract to develop systems

0	1	0	0

CISB 460/56 Electronic Commerce Systems

1. explain security and privacy issues
2. explain the basis for a legal contract to develop systems

0	1	0	0

16   **IS Theory**

CISB 392   Information Systems Theory and Practice
1. identify and explain underlying concepts of IS discipline

0	0	0	1

CISB 101   Business Information Technology

1. identify and explain underlying concepts of IS discipline

17   **IS as a Strategic Component**

CISB 392   Information Systems Theory and Practice

0	0	1	0

1. describe the historic development of the information systems discipline
2. explain the strategic role of information systems in organizations
3. explain strategic relationship of IS activities to enhancing competitive position
4. explain the differences between strategic...

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. describe the historic development of the information systems discipline
2. explain the strategic role of information systems in organizations
3. explain strategic relationship of IS activities to enhancing competitive position
4. explain the differences between strategic...

CISB 400   Data Communications and Network Management

0	1	0	0

1. describe the historic development of the information systems discipline
2. explain the strategic role of information systems in organizations
3. explain strategic relationship of IS activities to enhancing competitive position
4. explain the differences between strategic...

IS Development and Management

CISB 210   Fundamentals of Information Systems

1	0	0	0

1.   explain information systems development and organizational process redesign; explain groups of individuals and their responsibilities in this process
2.   explain the roles of professional IS personnel within an IS organization; explain functions of IS management, CIO, project manager, ...

CISB 392   Information Systems Theory and Practice

0	1	0	0

1.   explain information systems development and organizational process redesign; explain groups of individuals and their responsibilities in this process
2.   explain the roles of professional IS personnel within an IS organization; explain functions of IS management, CIO, project manager, ...

CISB 442   Systems Analysis and Design

0	0	0	1

1.   explain information systems development and organizational process redesign; explain groups of individuals and their responsibilities in this process
2.   explain the roles of professional IS personnel within an IS organization; explain functions of IS management, CIO, project manager, ...

CISB 400 Data Communications and Network Management

1	0	0	0

1. explain information systems development and organizational process redesign; explain groups of individuals and their responsibilities in this process
2. explain the roles of professional IS personnel within an IS organization; explain functions of IS management, CIO, project manager, ...

CISB 460/56 Electronic Commerce Systems

1	0	0	0

1. explain information systems development and organizational process redesign; explain groups of individuals and their responsibilities in this process
2. explain the roles of professional IS personnel within an IS organization; explain functions of IS management, CIO, project manager, ...

19   Personal, Cognitive Process

CISB 210 Fundamentals of Information Systems

0	0	1	0

1. explain cognitive process and other human oriented considerations in information systems design and implementation

CISB 442 Systems Analysis and Design

0	0	0	1

1. explain cognitive process and other human oriented considerations in information systems design and implementation

CISB 392 Information Systems Theory and Practice

0	0	1	0

1. explain cognitive process and other human oriented considerations in information systems design and implementation

20   Personal, Goals and Decisions

CISB 210 Fundamentals of Information Systems

0	1	0	0

1. discuss and explain how individuals make decisions, set and achieve goals; explain what is meant by mission directed personal action

CISB 392   Information Systems Theory and Practice

0	0	1	0

1. discuss and explain how individuals make decisions, set and achieve goals; explain what is meant by mission directed personal action

21 Decision Making, Simon Model

CISB 392   Information Systems Theory and Practice

0	1	0	0

Explain IS support for decision making.

CISB 210   Fundamentals of Information Systems

1	0	0	0

1.   discuss and explain decision theory and the decision process
2.   explain IS support for decision making; explain the use of expert systems in support of heuristic decision making
3. explain and give an illustration of the Simon organizational decision model

22 Systems and Quality, and IS

CISB 392   Information Systems Theory and Practice

0	1	0	0

1.   explain the use of information and information systems in documentation, decision making and control of organizational activity
2. discuss and explain systems goals, client expectation, and quality concepts
3. discuss and explain systems components and relationships ...

23 Systems, Role of Management, Users, Designers

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   identify the generic responsibilities of users, designers and management in terms described in the Churchman "trinity"; discuss in systems terms detailed obligations of each in order to ensure quality; relate these observations to the quality improvement models for organizational development;

CISB 392   Information Systems Theory and Practice

0	1	0	0

1. identify the generic responsibilities of users, designers and management in terms described in the Churchman "trinity"; discuss in systems terms detailed obligations of each in order to ensure quality; relate these observations to the quality improvement models for organizational development;

CISB 442   Systems Analysis and Design

0	0	1	0

1. identify the generic responsibilities of users, designers and management in terms described in the Churchman "trinity"; discuss in systems terms detailed obligations of each in order to ensure quality; relate these observations to the quality improvement models for organizational development;

CISB 460/56 Electronic Commerce Systems

1	0	0	0

1. identify the generic responsibilities of users, designers and management in terms described in the Churchman "trinity"; discuss in systems terms detailed obligations of each in order to ensure quality; relate these observations to the quality improvement models for organizational development;

24   Systems, Work-Flow, Organizational Systems

CISB 451   Database Administration

1. explain the relation of database modeling to organizational physical activity

0	0	0	1

25   Models, Organizational Relationship to IS

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   describe the role of information technology (IT) and the roles of people using, designing and managing IT in organizations
2.   discuss how general systems theory is applicable to the analysis and development of an information system

CISB 392   Information Systems Theory and Practice

0	1	0	0

1.   describe the role of information technology (IT) and the roles of people using, designing and managing IT in organizations
2.   discuss how general systems theory is applicable to the analysis and development of an information system

CISB 392 Information Systems Theory and Practice				
	0	1	0	0

1. explain IS planning goals and processes
2. explain the importance of corporate and strategic planning and of aligning the project to the information systems plan

CISB 442 Systems Analysis and Design				
	0	0	1	0

1. explain IS planning goals and processes
2. explain the importance of corporate and strategic planning and of aligning the project to the information systems plan

CISB 451 Database Administration				
	0	1	0	0

1. explain IS planning goals and processes
2. explain the importance of corporate and strategic planning and of aligning the project to the information systems plan

CISB 400 Data Communications and Network Management				
	0	1	0	0

1. explain IS planning goals and processes
2. explain the importance of corporate and strategic planning and of aligning the project to the information systems plan

CISB 471 Advanced Information Systems				
	0	0	1	0

1. explain IS planning goals and processes
2. explain the importance of corporate and strategic planning and of aligning the project to the information systems plan

CISB 460/56 Electronic Commerce Systems

1. explain IS planning goals and processes
2. explain the importance of corporate and strategic planning and of aligning the project to the information systems plan

```
CISB  392          Information Systems Theory and Practice
                                                                    0          0          1          0
Differentiate between classifications of information systems.


CISB 210           Fundamentals of Information Systems
                                                                    0          0          1          0
1. describe the classifications of information systems, e.g., TPS, DSS, ESS, WFS
2. explain relevant organizational IS: TPS, DSS, EIS, ES, Work Flow Systems
```

28   IS Development Standards

```
CISB 210           Fundamentals of Information Systems
                                                                    0          1          0          0
   1.       discuss and explain the concept of an IS development methodology; explain lifecycle,
workflow, OOA, prototyping, risk-based models, spiral and other restricting models


CISB 392           Information Systems Theory and Practice
                                                                    0          1          0          0
1. discuss and explain the concept of an IS development methodology; explain lifecycle, workflow, OOA,
prototyping, risk-based models, spiral and other restricting models; show how this can be proactively
furnished


CISB 442           Systems Analysis and Design
                                                                    0          0          0          1
1. discuss and explain the concept of an IS development methodology; explain lifecycle, workflow, OOA,
prototyping, risk-based models, spiral and other restricting models; show how this can be proactively
furnished
```

29   IS Implementation, Outsourcing

```
CISB 210           Fundamentals of Information Systems
                                                                    0          1          0          0
   1.       explain the advantages and disadvantages of outsourcing some or most of the IS function;
state IS personnel requirements with and without outsourcing
```

CISB 392   Information Systems Theory and Practice

0	1	0	0

1. explain the advantages and disadvantages of outsourcing some or most of the IS function; state IS personnel requirements with and without outsourcing

CISB 442   Systems Analysis and Design

0	0	1	0

1. explain the advantages and disadvantages of outsourcing some or most of the IS function; state IS personnel requirements with and without outsourcing

CISB 471   Advanced Information Systems

0	1	0	0

1. explain the advantages and disadvantages of outsourcing some or most of the IS function; state IS personnel requirements with and without outsourcing

30   **Personal, Performance Evaluation**

CISB 392   Information Systems Theory and Practice

0	0	1	0

1.   describe, explain and apply the responsibilities of the project leader;
2.   discuss, explain and implement a methodology for tracking customer satisfaction within all phases of the life cycle
3. explain methodologies to facilitate ...

31   **IS Society and Ethics**

CISB 101   Business Information Technology

1	0	0	0

1. discuss and explain ethics and principled behavior and the concept of ethical practice in IS
2. discuss ethical major ethical models and discuss the reasons for being ethical
3. explain the use of professional codes of ethics;
   ...

CISB 210   Fundamentals of Information Systems

0	1	0	0

1. discuss and explain ethics and principled behavior and the concept of ethical practice in IS
2. discuss ethical major ethical models and discuss the reasons for being ethical
3. explain the use of professional codes of ethics;
   ...

CISB 392 Information Systems Theory and Practice

	Level 1	Level 2	Level 3	Level 4
	0	0	0	1

discuss and explain ethics and principled behavior and the concept of ethical practice in IS
discuss ethical major ethical models and discuss the reasons for being ethical
explain the use of professional codes of ethics;
...

CISB 471 Advanced Information Systems

	Level 1	Level 2	Level 3	Level 4
	0	0	0	1

discuss and explain ethics and principled behavior and the concept of ethical practice in IS
discuss ethical major ethical models and discuss the reasons for being ethical
explain the use of professional codes of ethics;
...

CISB 460/56 Electronic Commerce Systems

	Level 1	Level 2	Level 3	Level 4
	0	1	0	0

discuss and explain ethics and principled behavior and the concept of ethical practice in IS
discuss ethical major ethical models and discuss the reasons for being ethical
explain the use of professional codes of ethics;
...

CISB 451 Database Administration

	Level 1	Level 2	Level 3	Level 4
	1	0	0	0

IS . 4 Information Technology Hardware and System Software

Local Objectives

Distinct LUs Covered: 9	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
LU **LU Title**				
62 **Telecom, Systems View HW/SW**				
CISB 260 Information Systems Architecture	0	0	1	0

1. use the systems approach to explain the hardware and software components of a telecommunications system, and to diagram and discuss the nature of the interactions of the components; explain in systems terms the purpose, expectations and the quality of a telecommunications system, and show how th

CISB 101 Business Information Technology

1. use the systems approach to explain the hardware and software components of a telecommunications

system, and to diagram and discuss the nature of the interactions of the components; explain in systems terms the purpose, expectations and the quality of a telecommunications system, and show how the components work purposefully together

63   IT Peripheral Devices

CISB 260   Information Systems Architecture

0	1	0	0

1.   identify major classes of peripheral devices and explain the principles of operation and software requirements and functions provided for each type of device; give specific examples of each device identified, and discuss the installation requirements for the hardware and required software

CISB 101   Business Information Technology

1	0	0	0

1. identify major classes of peripheral devices and explain the principles of operation and software requirements and functions provided for each type of device; give specific examples of each device identified, and discuss the installation requirements for the hardware and required software

64   IT Hardware Architectures

CISB 260   Information Systems Architecture

1.   define data and communication requirements to access local (the hard-disk, or server) and remote data (e.g., via internet) to solve individual problems

0	1	0	0

2.   describe and explain the major hardware and software components of a computing system and how they interact

CISB 101   Business Information Technology

1	0	0	0

2. describe and explain the major hardware and software components of a computing system and how they interact

65   IT Systems Software Components, Interactions

CISB 260   Information Systems Architecture

0	1	0	0

1. describe and explain the major components of an operating system and how they interact
2. explain the control of input/output functions; install and configure drivers

CISB 101   Business Information Technology

| | 1 | 0 | 0 | 0 |

1. describe and explain the major components of an operating system and how they interact
2. explain the control of input/output functions; install and configure drivers

67   OS Functions

CISB 260   Information Systems Architecture

| | 0 | 1 | 0 | 0 |

1.   explain the concept of tasks and processes
2. explain the concept of concurrency and multi-tasking
3.   explain routine behavior of task schedulers, priority queues, interrupt processing, memory management and file system

CISB 101   Business Information Technology

| | 1 | 0 | 0 | 0 |

1. explain the concept of tasks and processes
2. explain the concept of concurrency and multi-tasking

68   OS Environments and Resources

CISB 260   Information Systems Architecture

| | 0 | 0 | 1 | 0 |

1.   describe and discuss several computer system operating environments including traditional, graphical user interface, and multi-media; estimate the hardware and software items and approximate cost for each environment; discuss relative advantages for each environment

69   OS, Installation, Configuration for Multi-Media

CISB 260   Information Systems Architecture

| | 0 | 0 | 0 | 1 |

1.   discuss and explain the hardware and software requirements necessary to support multimedia
2.   explain development software tools which support multimedia environments; discuss the advantages and shortcomings of various development tools and environments

70   OS, Interoperability and Systems Integration

```
CISB 260              Information Systems Architecture
```
| | 0 | 1 | 0 | 0 |

```
1.              explain concepts of interoperability and systems integration in relation to policies and
practices
2.              explain components of hardware and software to connect and implement networked solutions
for PC networks and more advanced LAN and WAN environments.
```

71   OS, Installation, Configuration of Multi-User Systems

```
CISB 260              Information Systems Architecture
```
| | 0 | 0 | 0 | 1 |

```
1.              build system software command structures (e.g. JCL) for microcomputer systems involving
the macro facilities of the operating system
install, configure and operate a multi-user operating system
```

```
IS . 5   Programming, Data, File and Object Structures
```
Local Objectives

Distinct LUs Covered: 20	**Level 1 Recognize**	**Level 2 Differentiate**	**Level 3 Use**	**Level 4 Apply**
LU **LU Title**				

42   Information   Measurements/Data/Events

```
CISB 331              Advanced Business Programming
```
| | 0 | 0 | 1 | 0 |

```
1. explain the concept of measurement and information, information representation,
organization, storage and processing
2. describe the concept that data is a representation and measurement of real-world events and
the process of capturing it in machine readable forms
```

```
CISB 305              Solving Problems Using Spreadsheets and Statistical Software
```
| | 0 | 1 | 0 | 0 |

```
1.              explain the concept of measurement and information, information representation,
organization, storage and processing
2.              describe the concept that data is a representation and measurement of real-world events and
the process of capturing it in machine readable forms
```

```
CISB 205              Advanced Business Software
```
| | 1 | 0 | 0 | 0 |

```
1.              explain the concept of measurement and information, information representation,
organization, storage and processing
2.              describe the concept that data is a representation and measurement of real-world events and
the process of capturing it in machine readable forms
```

| CISB 206 | Business Database Application Programming | 0 | 1 | 0 | 0 |

1. explain the concept of measurement and information, information representation, organization, storage and processing
2. describe the concept that data is a representation and measurement of real-world events and the process of capturing it in machine readable forms

| CISB 210 | Fundamentals of Information Systems | 1 | 0 | 0 | 0 |

1. explain the concept of measurement and information, information representation, organization, storage and processing
2. describe the concept that data is a representation and measurement of real-world events and the process of capturing it in machine readable forms

43   Data: Characters, Records, Files, Multi-Media

| CISB 331 | Advanced Business Programming | 0 | 0 | 0 | 1 |

1.   identify, explain and discuss the data hierarchy and identify all primary operations associated with each level of the hierarchy

| CISB 305 | Solving Problems Using Spreadsheets and Statistical Software | 0 | 0 | 0 | 1 |

1. identify, explain and discuss the data hierarchy and identify all primary operations associated with each level of the hierarchy

| CISB 205 | Advanced Business Software | 1 | 0 | 0 | 0 |

1. identify, explain and discuss the data hierarchy and identify all primary operations associated with each level of the hierarchy

| CISB 206 | Business Database Application Programming |

1. identify, explain and discuss the data hierarchy and identify all primary operations associated with each level of the hierarchy

44   ADTs, Classes, Objects

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

0	0	1	0

1.   discuss classes which involve elements of the "hierarchy of data" (bit, byte, fields, records, files, database), and use these definitions as a basis for the solutions to problems; describe program structures and their usage relating to each data structure

CISB 451   Database Administration

0	1	0	0

1. discuss classes which involve elements of the "hierarchy of data" (bit, byte, fields, records, files, database), and use these definitions as a basis for the solutions to problems; describe program structures and their usage relating to each data structure

CISB 206   Business Database Application Programming

0	0	1	0

1. discuss classes which involve elements of the "hierarchy of data" (bit, byte, fields, records, files, database), and use these definitions as a basis for the solutions to problems; describe program structures and their usage relating to each data structure

CISB 442   Systems Analysis and Design

0	0	1	0

1. discuss classes which involve elements of the "hierarchy of data" (bit, byte, fields, records, files, database), and use these definitions as a basis for the solutions to problems; describe program structures and their usage relating to each data structure

CISB 331   Advanced Business Programming

0	0	0	1

1. discuss classes which involve elements of the "hierarchy of data" (bit, byte, fields, records, files, database), and use these definitions as a basis for the solutions to problems; describe program structures and their usage relating to each data structure

45   Problem Solving, Formal Problems and IS

CISB 331   Advanced Business Programming

0	0	0	1

1.   explain and give examples of the concept of writing computer programs and using software development languages and application development facilities to solve problems

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

0	0	0	1

1. explain and give examples of the concept of writing computer programs and using software development languages and application development facilities to solve problems

CISB 206   Business Database Application Programming

0	0	0	1

1. explain and give examples of the concept of writing computer programs and using software development languages and application development facilities to solve problems

46   Object Representation of a System

CISB 451   Database Administration

0	1	0	0

1.   discuss and explain a systems view of an object representation; explain the similarity of an object representation to conventional data flow notation

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

1	0	0	0

1. discuss and explain a systems view of an object representation; explain the similarity of an object representation to conventional data flow notation

CISB 206   Business Database Application Programming

1	0	0	0

1. discuss and explain a systems view of an object representation; explain the similarity of an object representation to conventional data flow notation

CISB 442   Systems Analysis and Design

0	0	0	1

1. discuss and explain a systems view of an object representation; explain the similarity of an object representation to conventional data flow notation

CISB 331   Advanced Business Programming

☐	☐	☐	1

1. discuss and explain a systems view of an object representation; explain the similarity of an object representation to conventional data flow notation

47 Problem Solving, Algorithm Development

CISB 331   Advanced Business Programming

☐	☐	☐	1

Design an algorithm and code a working solution using COBOL.

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

☐	☐	☐	1

1.   design algorithms and translate them into working solutions in a programming language for many component problems involved in complete information system applications

CISB 206   Business Database Application Programming

☐	☐	☐	1

1. design algorithms and translate them into working solutions in a programming language for many component problems involved in complete information system applications

48 Problem Solving, Top Down Implementation

CISB 331   Advanced Business Programming

☐	☐	☐	1

1.   design and implement programs in a top-down manner, building first the top levels, stubbing the lower levels; successively complete lower levels in the same manner; identify the concept of continued success in this method

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

☐	☐	1	☐

1. design and implement programs in a top-down manner, building first the top levels, stubbing the lower levels; successively complete lower levels in the same manner; identify the concept of continued success in this method

CISB 206　　　Business Database Application Programming

0	0	1	0

1. design and implement programs in a top-down manner; building first the top levels, stubbing the lower levels; successively complete lower levels in the same manner; identify the concept of continued success in this method

49　Problem Solving, Object Implementation

CISB 305　　　Solving Problems Using Spreadsheets and Statistical Software

0	0	0	1

1.　　explain and implement modular structures; show the relation of data flow and object representations to the produced code

CISB 206　　　Business Database Application Programming

0	0	0	1

1. explain and implement modular structures; show the relation of data flow and object representations to the produced code

50　Problem Solving, Modules/Cohesion/Coupling

CISB 331　　　Advanced Business Programming

0	0	0	1

Use modular design in the solution of a problem and then implement the solution.

CISB 305　　　Solving Problems Using Spreadsheets and Statistical Software

0	0	1	0

1.　　develop and translate a data flow representation of a problem solution to a hierarchical and/or object representation
2.　　use algorithmic and modular design in the solution of a problem and implement the solution with a procedural language

CISB 206　　　Business Database Application Programming

0	0	1	0

1. develop and translate a data flow representation of a problem solution to a hierarchical and/or object representation
2. use algorithmic and modular design in the solution of a problem and implement the solution with a procedural language

51 Verification and Validation, A Systems View

CISB 331   Advanced Business Programming

□	□	□	1

1.   explain the verification and validation process; verify code by manual re-engineering to both procedural and/or object representations
2. develop data flow designs and translate these designs to pseudocode or fourth GLs

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

□	□	□	1

1.   explain the verification and validation process; verify code by manual re-engineering to both procedural and/or object representations
2. develop data flow designs and translate these designs to pseudocode or fourth GLs

CISB 205   Advanced Business Software

□	1	□	□

1.   explain the verification and validation process; verify code by manual re-engineering to both procedural and/or object representations
2. develop data flow designs and translate these designs to pseudocode or fourth GLs

CISB 206   Business Database Application Programming

□	□	□	1

1. explain the verification and validation process; verify code by manual re-engineering to both procedural and/or object representations
2. develop data flow designs and translate these designs to pseudocode or fourth GLs

52 Problem Solving, Environments and Tools

CISB 331   Advanced Business Programming

□	1	□	□

1.   demonstrate ability to evaluate and use existing GUI components in construction of an effective user interface for an application

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

□	1	□	□

1. demonstrate ability to evaluate and use existing GUI components in construction of an effective user interface for an application

CISB 451	Database Administration	0	0	1	0

1. demonstrate ability to evaluate and use existing GUI components in construction of an effective user interface for an application

CISB 442	Systems Analysis and Design	0	0	1	0

1. demonstrate ability to evaluate and use existing GUI components in construction of an effective user interface for an application

CISB 206	Business Database Application Programming	0	1	0	0

1. demonstrate ability to evaluate and use existing GUI components in construction of an effective user interface for an application

ADTs: Data and Files Structures

CISB 331	Advanced Business Programming	0	0	1	0

1.   explain the ADTs necessary to access records in an indexed data file; show examples of each type of operation required

CISB 305	Solving Problems Using Spreadsheets and Statistical Software	0	0	0	1

1. explain the ADTs necessary to access records in an indexed data file; show examples of each type of operation required

CISB 206	Business Database Application Programming

1. explain the ADTs necessary to access records in an indexed data file; show examples of each type of operation required

54   **ADTs: Arrays, Lists, Trees, Records**

CISB 331   Advanced Business Programming

0	0	0	1

1. use array representations

56   Problem Solving, IS Applications, Sub-Structures

CISB 331   Advanced Business Programming

0	1	0	0

1.   apply application software to solve small scale problems
2.   develop user and system documentation for a program solution to a problem of moderate complexity

CISB 451   Database Administration

0	1	0	0

1.   apply application software to solve small scale problems
2.   develop user and system documentation for a program solution to a problem of moderate complexity

CISB 442   Systems Analysis and Design

0	0	1	0

1. apply application software to solve small scale problems
2. develop user and system documentation for a program solution to a problem of moderate complexity

57   Problem Solving, Data and File Applications

CISB 331   Advanced Business Programming

0	0	1	0

1.   use abstract data types involved in common IS applications to implement solutions to problems involving indexed file processing techniques.

CISB 305   Solving Problems Using Spreadsheets and Statistical Software

1	0	0	0

1. use abstract data types involved in common IS applications to implement solutions to problems involving indexed file processing techniques.

Course				
CISB 206 — Business Database Application Programming	1	0	0	0

1. use abstract data types involved in common IS applications to implement solutions to problems involving indexed file processing techniques.

CISB 442 — Systems Analysis and Design	0	0	1	0

1. use abstract data types involved in common IS applications to implement solutions to problems involving indexed file processing techniques.

CISB 451 — Database Administration	0	1	0	0

1. use indexed files and ADTs to solve simple problems involving files used as elements of a database solution.

58   Problem Solving, with Files and Database

CISB 205 — Advanced Business Software	0	0	0	1

1.   use indexed files and ADTs to solve simple problems involving files used as elements of a database solution.

CISB 305 — Solving Problems Using Spreadsheets and Statistical Software	0	0	1	0

1. use indexed files and ADTs to solve simple problems involving files used as elements of a database solution.

CISB 206 — Business Database Application Programming	0	0	1	0

1. use indexed files and ADTs to solve simple problems involving files used as elements of a database solution.

CISB 442   Systems Analysis and Design   1   0   0   0

CISB 451   Database Administration   0   1   0   0

1. use indexed files and ADTs to solve simple problems involving files used as elements of a database solution.

59   Problem Solving, File/DB Editors/Reports

CISB 331   Advanced Business Programming   0   1   0   0

1. build and document several applications using indexed files, screen editors, and reports

CISB 442   Systems Analysis and Design   1   0   0   0

CISB 451   Database Administration   0   1   0   0

1. build and document several applications using indexed files, screen editors, and reports

60   Problem Solving, Design, Test, Debug

CISB 305   Solving Problems Using Spreadsheets and Statistical Software   0   0   0   1

1. define, explain and present the process of stating and solving formal analytic problems

CISB 331   Advanced Business Programming

define, explain and present the process of stating and solving formal analytic problems

0	0	0	1

CISB 206   Business Database Application Programming

1. define, explain and present the process of stating and solving formal analytic problems

0	0	0	1

CISB 442   Systems Analysis and Design

1	0	0	0

61   **Programming: Language Comparison**

CISB 331   Advanced Business Programming

Compare the capabilities of programming languages.

0	0	0	1

CISB 442   Systems Analysis and Design

1	0	0	0

IS . 6   Networks and Telecommunication

Local Objectives

Distinct LUs Covered: 11

LU	**LU Title**	**Level 1 Recognize**	**Level 2 Differentiate**	**Level 3 Use**	**Level 4 Apply**
124	IS Management of Emerging Technologies				

CISB 392 Information Systems Theory and Practice			
Discuss the management of emerging technologies.			
0	1	0	0

1. explain and detail methods for environment scanning and selecting effective hardware and software
2. explain management of emerging technologies

CISB 400 Data Communications and Network Management			
1	0	0	0

CISB 471   Advanced Information Systems

| 0 | 1 | 0 | 0 |

1.   explain and detail methods for environment scanning and selecting effective hardware and software
2. explain management of emerging technologies

CISB 460/56 Electronic Commerce Systems

| 0 | 1 | 0 | 0 |

1.   explain and detail methods for environment scanning and selecting effective hardware and software
2. explain management of emerging technologies

32   Telecom, Devices, Media, Systems

CISB 400   Data Communications and Network Management

| 0 | 1 | 0 | 0 |

1.   identify the characteristics of telecommunication transmission media to LAN, MAN and WAN environments
2. access a remote information system for file transfer in both LAN and WAN environments
3. discuss and explain the telecommunications industry and the concepts of standards and reg

33   Telecom, Organizational Support By

CISB 400   Data Communications and Network Management

| 0 | 1 | 0 | 0 |

1.   explain the use of information systems to support "work flow"; discuss the concepts of teleconferencing and telecomputer conferencing in enabling communications and decision making; discuss and explain the infrastructure involving telecommunication systems

CISB 210   Fundamentals of Information Systems

1. explain the use of information systems to support "work flow"; discuss the concepts of teleconferencing and telecomputer conferencing in enabling communications and decision making;

| | 1 | 0 | 0 | 0 |

34   Telecom, Economics, Design Issues

CISB 400   Data Communications and Network Management

1.   explain the steps in analyzing and configuring a telecommunication system, including specific hardware and software components
2.   explain the purpose of modems, bridges, gateways, hubs, and routers in interconnecting systems

| | 0 | 0 | 1 | 0 |

35   Telecom, Standards, Standard Organizations

CISB 400   Data Communications and Network Management

1.   identify the role of standards and of regulatory organizations and their standards as a facilitator in achieving local through global telecommunications
2. explain digital coding of data relevant to telecommunications

| | 0 | 0 | 1 | 0 |

36   Telecom, Central/Distributed Systems

CISB 400   Data Communications and Network Management

1.   explain, diagram and discuss structures and principles involved in distributing computing resources and data; identify hardware and software requirements and approximate costs of centralized and distributed systems; discuss and explain risks, security and privacy in alternate system configurat

| | 0 | 0 | 1 | 0 |

37   Telecom, Architectures, Topologies, Protocols

CISB 400   Data Communications and Network Management

1.   identify and explain the function of each of the layers of the ISO model
2.   explain the concept of "virtual" communications between communicating machines at each layer of the ISO model
3. identify and explain common topologies and implementation methods and issues for

| | 0 | 0 | 1 | 0 |

38   Telecom, Hardware and Software

CISB 400   Data Communications and Network Management

	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
	0	1	0	0

1.   describe, diagram, discuss and explain hardware and software components of telecommunications systems; describe integration of phone, fax, LAN and WAN systems; diagram and discuss various organizations of hardware, identifying and describing each type of required device

39   Telecom, Services, Reliability, Security...

CISB 400   Data Communications and Network Management

	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
	0	1	0	0

1.   explain telecommunications systems performance measures and ensure adequate performance and reliability

40   Telecom, Installation, Implementation

CISB 400   Data Communications and Network Management

	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
	0	0	1	0

explain, install and test modems, multiplexers and ethernet components
explain, install and test bridges and routers on appropriate hardware
install and operate terminal emulation software on a PC
explain and construct organizational plans for the use of EDI

41   Telecom, LAN, Installation, Configuration

CISB 400   Data Communications and Network Management

	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
	0	0	1	0

1.   design, install and manage a LAN
2.   explain and implement security appropriate for an end-user environment involving access to an enterprise level IS

IS . 7   Analysis and Logical Design

Local Objectives

Distinct LUs Covered: 14

LU	**LU Title**	**Level 1 Recognize**	**Level 2 Differentiate**	**Level 3 Use**	**Level 4 Apply**
72	IS Analysis and Design Tasks				

CISB 442   Systems Analysis and Design

0	0	1	0

With a project team, define the problem including the business needs, system capabilities, and draw context diagram to show the scope of the problem. Provide a clear, concise statement of the problem that the clients are facing.

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. explain IS life cycle phases and concepts and alternatives
2. detect problem to solve, re-engineer physical flow

CISB 392   Information Systems Theory and Practice

0	1	0	0

1. explain IS life cycle phases and concepts and alternatives
2. detect problem to solve, re-engineer physical flow

CISB 451   Database Administration

0	0	1	0

1. explain IS life cycle phases and concepts and alternatives
2. detect problem to solve, re-engineer physical flow

73   **IS Commercial Implementations**

CISB 101   Business Information Technology

0	1	0	0

1.   demonstrate ability to analyze alternative approaches to applications including packages, tailoring or customizing packages, adding modules to packages, and building unique applications
2. explain the concepts of acquiring computer hardware and software

CISB 205   Advanced Business Software

0	0	1	0

1.   demonstrate ability to analyze alternative approaches to applications including packages, tailoring or customizing packages, adding modules to packages, and building unique applications
2. explain the concepts of acquiring computer hardware and software

CISB 451   Database Administration

    1.   demonstrate ability to analyze alternative approaches to applications including packages, tailoring or customizing packages, adding modules to packages, and building unique applications
2. explain the concepts of acquiring computer hardware and software

0	0	0	1

CISB 471   Advanced Information Systems

    1.   demonstrate ability to analyze alternative approaches to applications including packages, tailoring or customizing packages, adding modules to packages, and building unique applications
2. explain the concepts of acquiring computer hardware and software

0	0	0	1

CISB 442   Systems Analysis and Design

1. demonstrate ability to analyze alternative approaches to applications including packages, tailoring or customizing packages, adding modules to packages, and building unique applications
2. explain the concepts of acquiring computer hardware and software

0	1	0	0

CISB 210   Fundamentals of Information Systems

1. demonstrate ability to analyze alternative approaches to applications including packages, tailoring or customizing packages, adding modules to packages, and building unique applications
2. explain the concepts of acquiring computer hardware and software

1	0	0	0

74   **IS Requirements and Specifications**

CISB 442   Systems Analysis and Design

Conduct information gathering interviews with individual clients and client group. Use CAI CASE tool to generate "upper case" documentation based on the interviews.

0	0	0	1

CISB 451   Database Administration

1. conduct an information gathering interview with individuals and with a group
2. conduct a JAD session using a GDS tool (either manual or electronic)
3. use CASE , I-CASE or other automated or non-automated tools
4. be able to use a commercial CASE tool to generate ...

0	0	0	1

75   **IS Design and Implementation**

CISB 442   Systems Analysis and Design

0	0	0	1

1. use CASE, I-CASE or other automated or non-automated tools
2. be able to use a commercial CASE tool to generate "upper case" documentation

CISB 471   Advanced Information Systems

0	0	0	1

1. use CASE, I-CASE or other automated or non-automated tools
2. be able to use a commercial CASE tool to generate "upper case" documentation

76 IS Rapid Prototyping

CISB 442   Systems Analysis and Design

0	0	0	1

Build a prototype of a system for a client during a semester-long project.

CISB 451   Database Administration

0	1	0	0

1. use rapid prototyping and other similar alternative mechanisms for rapid development of information systems

CISB 471   Advanced Information Systems

0	0	1	0

1. use rapid prototyping and other similar alternative mechanisms for rapid development of information systems

77 IS Development Risks/Feasibility

CISB 442   Systems Analysis and Design

0	1	0	0

Provide a basic understanding of the traditional Systems Analysis and Design concepts and techniques, such the top-down approach, problem definition, feasibility analysis, enterprise analysis, and data flow diagrams.

CISB 451   Database Administration

| | 0 | 1 | 0 | 0 |

1.   identify IS requirements and specifications and tentative logical design alternatives; evaluate proposed competitive advantage, feasibility and risk

CISB 471   Advanced Information Systems

| | 0 | 0 | 0 | 1 |

1. identify IS requirements and specifications and tentative logical design alternatives; evaluate proposed competitive advantage, feasibility and risk

78   IS Continuous Improvement and IS

CISB 442   Systems Analysis and Design

| | 0 | 0 | 1 | 0 |

1.   compare several proposed systems solutions, based on criteria for success
2.   identify, explain and use development methodologies compatible with the concept of process of continuous improvement
3. apply systems, decision and quality theory and information systems development ...

79   Interpersonal, Consensus Development

CISB 442   Systems Analysis and Design

| | 0 | 0 | 0 | 1 |

1. explain the concept of shared vision in developing effective solutions to organizational process
2. explain common forms of behavior that can lead to lack of communication

CISB 392   Information Systems Theory and Practice

| | 0 | 0 | 1 | 0 |

1. explain the concept of shared vision in developing effective solutions to organizational process
2. explain common forms of behavior that can lead to lack of communication

CISB 471   Advanced Information Systems

| | 0 | 0 | 1 | 0 |

1. explain the concept of shared vision in developing effective solutions to organizational process
2. explain common forms of behavior that can lead to lack of communication

80   **Interpersonal, Group Dynamics**

CISB 442 Systems Analysis and Design	0	0	0	1

1.   explain group and team behavior in an IS context
2.   explain how groups and teams should work together, empower co-workers, and apply team methods; measure and prove empowerment and effectiveness; participate effectively in cooperative team work; and evaluate success of work

CISB 471 Advanced Information Systems	0	0	0	1

1.   explain group and team behavior in an IS context
2.   explain how groups and teams should work together, empower co-workers, and apply team methods; measure and prove empowerment and effectiveness; participate effectively in cooperative team work; and evaluate success of work

81   **IS Database Applications Development**

CISB 451 Database Administration	0	0	0	1

1.   design and implement an information system within a database environment
2.   develop dataflow and/or an event driven models of the components of an information system, and design the implementation of the concepts
3. develop the corresponding database and implement the schema w/ DBMS ...

CISB 471 Advanced Information Systems	0	0	0	1

1.   design and implement an information system within a database environment
2.   develop dataflow and/or an event driven models of the components of an information system, and design the implementation of the concepts
3. develop the corresponding database and implement the schema w/ DBMS ...

CISB 442 Systems Analysis and Design	0	0	0	1

1.   design and implement an information system within a database environment
2.   develop dataflow and/or an event driven models of the components of an information system, and design the implementation of the concepts
3. develop the corresponding database and implement the schema w/ DBMS ...

CISB 101 Business Information Technology	1	0	0	0

1. design and implement an information system within a database environment

82   **Problem Solving, Complexity Metrics**

CISB 331	Advanced Business Programming				
1. apply system software functions to analyze resource use and performance characteristics for an application		1	0	0	0

CISB 442	Systems Analysis and Design				
1. apply system software functions to analyze resource use and performance characteristics for an application		1	0	0	0

83   **IS Software Quality Metrics**

CISB 331	Advanced Business Programming				
1. explain how written standards describing each phase of the life-cycle can evolve; explain the relevance of written standards, and the desirability of developing quality assurance procedures 2. describe and explain the use of quality metrics in assessment of software development and in facilita		1	0	0	0

CISB 442	Systems Analysis and Design				
1. explain how written standards describing each phase of the life-cycle can evolve; explain the relevance of written standards, and the desirability of developing quality assurance procedures 2. describe and explain the use of quality metrics in assessment of software development and in facilita		1	0	0	0

84   **Systems and Quality Metrics/Assessment**

CISB 331	Advanced Business Programming				
1. use quality metrics and performance benchmarks to ensure customer satisfaction for each phase of the life cycle. Test the metrics during system development activities		1	0	0	0

CISB 471	Advanced Information Systems				
1. use quality metrics and performance benchmarks to ensure customer satisfaction for each phase of the life cycle. Test the metrics during system development activities		1	0	0	0

CISB 442   Systems Analysis and Design

1	0	0	0

1. use quality metrics and performance benchmarks to ensure customer satisfaction for each phase of the life cycle. Test the metrics during system development activities

CISB 451   Database Administration

0	0	1	0

1. use quality metrics and performance benchmarks to ensure customer satisfaction for each phase of the life cycle. Test the metrics during system development activities

85   IS Professional Code of Ethics

CISB 210   Fundamentals of Information Systems

0	1	0	0

1.   identify and describe professional organizations
2. explain setting an ethical standard
3.   explain and examine ethical issues and arguments and failed approaches as a function of power and social context

CISB 392   Information Systems Theory and Practice

0	1	0	0

1. identify and describe professional organizations
2. explain setting an ethical standard
3. explain and examine ethical issues and arguments and failed approaches as a function of power and social context

CISB 471   Advanced Information Systems

0	1	0	0

1. identify and describe professional organizations
2. explain setting an ethical standard
3. explain and examine ethical issues and arguments and failed approaches as a function of power and social context

CISB 442   Systems Analysis and Design

0	0	0	1

1. identify and describe professional organizations
2. explain setting an ethical standard
3. explain and examine ethical issues and arguments and failed approaches as a function of power and social context

Distinct LUs Covered:	16		Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
LU	LU Title					
117	Personal, Presentation					
CISB 451	Database Administration		0	0	1	0

To show how to present a system design, test plan, implementation plan, and evaluation, in written and oral form.

CISB 471	Advanced Information Systems		0	0	0	1

1. present and explain solutions to a peer group for critique and improvement
2. apply oral and written communication skills to present proposed solutions and accomplishments

127	Quality and Performance Management					
CISB 451	Database Administration		0	0	1	0

To discuss performance evaluation consistent with quality management and continuous improvement.

CISB 471	Advanced Information Systems		0	0	0	1

1. develop performance measures consistent with the concepts of valuing employees that facilitate team cooperation and discourage competitiveness among team members; discuss the reasons for such measures and explain the negative consequences of misunderstanding these issues

86	Interpersonal, Synergistic Solutions					
CISB 451	Database Administration		0	1	0	0

To discuss the importance of finding synergistic solutions with team and clients.

87   Interpersonal, Agreements and Commitment

CISB 451   Database Administration

0	0	0	1

To show how to develop agreements describing work to be done, and to commit, rigorously completed and self-evaluated agreed work.

88   IS Data Modeling

CISB 451   Database Administration

0	0	0	1

To develop skill with data modeling of databases.

89   ADTs: Database Models and Functions

CISB 451   Database Administration

0	1	0	0

To develop awareness of the syntactical and theoretical differences between database models.

90   IS Database and IS Implementation

CISB 451   Database Administration

0	0	0	1

To develop skill in application of data systems development and retrieval facilities needed to facilitate creation of information system application.

91   IS Database Application Structuring

CISB 451   Database Administration

0	0	1	0

To develop skills with application and structuring of database management system.

92   IS Database Application Implementation

CISB 451   Database Administration

To develop skill with application and physical implementation of database systems, using a
programming environment.

0	0	0	1

93   IS Application Development/Code Generation

CISB 451   Database Administration

To develop skills with use of a combination of code generators and language facilities to implement
multi-user departmental or simple enterprise level systems.

0	0	0	1

94   IS Development and Project Management

CISB 451   Database Administration

To provide an opportunity to develop and use project management, project standards, and a system
implementation plan, and to implement a documentation plan.

0	0	1	0

CISB 471   Advanced Information Systems

1	0	0	0

CISB 210   Fundamentals of Information Systems

to provide an opportunity to develop and use project management

1	0	0	0

95   IS Database Conceptual/Logical Models

CISB 451   Database Administration

To show how to design a conceptual relational database model and logical database model, convert the logical database designs to physical designs, develop the physical database, and generate test data.

0	0	1	0

CISB 471   Advanced Information Systems

1. explain a framework for evaluating an information system function and value of individual applications
2. explain the use of critical success factors
3. translate a logical system design into a physical design in a target environment, and,

0	0	0	1

96   IS Functional Specifications

CISB 451   Database Administration

To provide opportunity to develop functional specifications for an information system, develop a detailed information system design, and develop information system application controls.

0	0	0	1

CISB 471   Advanced Information Systems

1. use a methodology to specify and develop an information system of departmental level significance; ensure that data collection, verification, and control is accomplished; ensure that external audits will establish consistent goals and accomplishments

0	0	0	1

97   IS Conversion Planning

CISB 451   Database Administration

To show how to develop a conversion and installation plan, develop a hardware systems and environmental plan.

0	0	1	0

CISB 471   Advanced Information Systems

1. develop a detailed training, conversion and installation plan for hardware and software involving a newly developed information system application
2. design networked solutions and install the DBMS on the server along with appropriate OS and telecommunications hardware and software

0	0	0	1

CISB 451	Database Administration				
		0	0	1	0

To show how to develop detailed program specifications, develop programs, set up systems test parameters, install and test the new system, implement the conversion plan, employ configuration management.

CISB 471	Advanced Information Systems				
		1	0	0	0

99   IS Requirements/Work-Flow Planning

CISB 451	Database Administration				
		0	1	0	0

To show how to develop a physical work-flow plan with a client.

CISB 471	Advanced Information Systems				
		1	0	0	0

IS . 9 Physical Design and Implementation in Emerging Environments

Local Objectives

Distinct LUs Covered:	11	Level 1 Recognize	Level 2 Differentiate	Level 3 Use	Level 4 Apply
LU	LU Title				
100	IS Application with Programming Language				
CISB 471	Advanced Information Systems				
		0	0	0	1

1. design and implement information systems application software using a programming environment which utilizes database programming

2. use productivity tools to develop conceptual data and functional models

101   IS Implementation with Objects, Event Driven

CISB 471   Advanced Information Systems

□	1	□	□

1. employ a programming environment to develop a simple event-driven application with a GUI interface

CISB 331   Advanced Business Programming

□	□	□	1

1. employ a programming environment to develop a simple event-driven application with a GUI interface

103   IS Development Testing

CISB 471   Advanced Information Systems

1. construct effective queries using both structured and unstructured query tools
2. reverse engineer data flows from fourth GL applications to ensure verification

□	□	□	1

104   IS Applications, Programming Environment

CISB 471   Advanced Information Systems

1. explain the characteristics, requirements and use of several programming environments including graphical and conventional environments; explain the concepts of software portability and the concepts of interoperability

□	1	□	□

112   Personal, Proactivity, Principled Action

CISB 471   Advanced Information Systems

1. describe and explain character habits of proactive leadership and time management

□	□	□	1

113   Interpersonal, Empathetic Listening

CISB 442   Systems Analysis and Design

0	0	1	0

1. use and apply team work, empowerment methods, apply meetings concepts and methods, use group techniques, use empathetic listening skills, employ synergistic solution development
2. ensure that empathetic listening is practiced; ensure that individuals listen, commit and rigorously ...

CISB 471   Advanced Information Systems

0	0	0	1

1. use and apply team work, empowerment methods, apply meetings concepts and methods, use group techniques, use empathetic listening skills, employ synergistic solution development
2. ensure that empathetic listening is practiced; ensure that individuals listen, commit and rigorously ...

114   Interpersonal, Goals, Mission, Alignment

CISB 471   Advanced Information Systems

0	0	0	1

1. discuss and explain the concepts of shared vision and mission directed activity in information system   development
2. discuss and apply mission directed work by aligning team mission to project mission by tracking to ensure the results

115   IS Responsibility to Sell Designs to Management

CISB 442   Systems Analysis and Design

0	0	1	0

Present system solutions during design and analysis phase to clients with management reviews to follow.

CISB 471   Advanced Information Systems

0	0	1	0

1. explain and prove the relationship of IS activities to enhancing competitive position
2. explain functions of IS management, CIO, project manager ...

116   IS Life Cycles and Projects

CISB 471   Advanced Information Systems

0	0	0	1

1. explain and apply various life cycle concepts ...
2. explain the different responsibilities of IS, CS and SE as they pertain ...
3. explain how formal software engineering techniques can contribute to the success of software and system development efforts; apply these techniques ...

118   Personal, Life-Long Learning

CISB 471   Advanced Information Systems

0	0	1	0

1. discuss and apply the concept of learning to learn continuously

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. discuss and apply the concept of learning to learn continuously

120   IS Management and IS Department Organization

CISB 471   Advanced Information Systems

0	0	0	1

1. describe and explain the composition of personnel needed to make up the team for a given project and use personnel management strategies
2. explain to a non-IS knowledge worker what they have to do to manage their information resources and requirements

CISB 210   Fundamentals of Information Systems

1	0	0	0

2. explain to a non-IS knowledge worker what they have to do to manage their information resources and requirements

IS . 10   Project Management and Practice

Distinct LUs Covered: 11

LU	Local Objectives		
	LU Title	IS	Development, Project
	105		

Planning

Level 1 Recognize | Level 2 Differentiate | Level 3 Use | Level 4 Apply

164

CISB 442   Systems Analysis and Design

Design a project development and implementation plan for a live project.

0	0	1	0

CISB 451   Database Administration

1. explain steering and other committee functions, and the rationale ...
2. To develop skills in Function Point Analysis adequate enough to allow a student to develop project effort estimates using standards ...
3. To develop skills in Function Point Analysis adequate ...

0	0	1	0

CISB 471   Advanced Information Systems

1. explain steering and other committee functions, and the rationale ...
2. To develop skills in Function Point Analysis adequate enough to allow a student to develop project effort estimates using standards ...
3. To develop skills in Function Point Analysis adequate

0	0	0	1

CISB 210   Fundamentals of Information Systems

to ensure skills needed to design a project development and implementation plan

0	0	1	0

106   IS Development, Project Management

CISB 442   Systems Analysis and Design

1. apply meeting design concepts to organizing and conducting effective team and client meetings which ensure shared vision and empowered actions

0	0	0	1

CISB 451   Database Administration

1. apply meeting design concepts to organizing and conducting effective team and client meetings which ensure shared vision and empowered actions

0	1	0	0

CISB 471   Advanced Information Systems

	0		0		1		0

1. apply meeting design concepts to organizing and conducting effective team and client meetings which ensure shared vision and empowered actions

CISB 210   Fundamentals of Information Systems

	0		1		0		0

1. apply meeting design concepts to organizing and conducting effective team and client meetings which ensure shared vision and empowered actions

107 IS Development, Project Management

CISB 442   Systems Analysis and Design

	0		0		1		0

Use and apply project management tools, techniques and software (Microsoft Project Management) in definition, implementation and modification of project goals. Create gantt charts for the design and implementation phases.

CISB 451   Database Administration

	0		0		1		0

1. use and apply project management tools, techniques and software in definition, implementation and modification of project goals; produce timely management, individual, team and customer information progress reports to ensure quality software development, physical workflow system implementation..

CISB 471   Advanced Information Systems

	0		0		0		1

1. use and apply project management tools, techniques and software in definition, implementation and modification of project goals; produce timely management, individual, team and customer information progress reports to ensure quality software development, physical workflow system implementation..

CISB 210   Fundamentals of Information Systems

	0		0		1		0

1. use and apply project management tools, techniques and software in definition, implementation and modification of project goals; produce timely management, individual, team and customer information progress reports to ensure quality software development, physical workflow system implementation, computer systems installation

108 IS Development, Project Management Tools

CISB 442   Systems Analysis and Design

0	0	1	0

Use project management tracking tools such as GANTT and CASE.

CISB 451   Database Administration

1	0	0	0

   1. use project management concepts and tracking tools (PERT, GANTT)
   2. use project management techniques e.g. tracking, PERT, GANTT
   3. use CASE and other tools

CISB 471   Advanced Information Systems

0	1	0	0

   1. use project management concepts and tracking tools (PERT, GANTT)
   2. use project management techniques e.g. tracking, PERT, GANTT
   3. use CASE and other tools

CISB 210   Fundamentals of Information Systems

0	0	1	0

   1. use project management concepts and tracking tools (PERT, GANTT)
   2. use project management techniques e.g. tracking, PERT, GANTT

109   IS Development, Project Close Down

CISB 451   Database Administration

0	0	1	0

   1. discuss and explain the concepts of terminating a project; explain and list the requirements
for project close down

CISB 471   Advanced Information Systems

0	0	1	0

1. discuss and explain the concepts of terminating a project; explain and list the requirements for
project close down

CISB 442   Systems Analysis and Design

0	0	1	0

1. discuss and explain the concepts of terminating a project; explain and list the requirements for project close down

110   IS Applications, Production Systems

CISB 451   Database Administration

0	1	0	0

1. develop and use detailed specifications to state and solve an information systems application problem including physical flows, database design, system functions, program requirements and design, as well as database and software implementation
2. design and implement a systems
   ...

CISB 471   Advanced Information Systems

0	0	1	0

1. develop and use detailed specifications to state and solve an information systems application problem including physical flows, database design, system functions, program requirements and design, as well as database and software implementation
2. design and implement a systems
   ...

CISB 442   Systems Analysis and Design

0	1	0	0

1. develop and use detailed specifications to state and solve an information systems application problem including physical flows, database design, system functions, program requirements and design, as well as database and software implementation
2. design and implement a systems ...

111   IS Requirements and Database

CISB 451   Database Administration

0	0	1	0

1. identify physical flows and horizontal integration of organizational processes, and relate these flows to the relevant databases which describe the flows;
2. develop event driven functional models for the involved organizational process
3. identify and specify the processes which solve ...

CISB 471   Advanced Information Systems

1. identify physical flows and horizontal integration of organizational processes, and relate these flows to the relevant databases which describe the flows;
2. develop event driven functional models for the involved organizational process

3. identify and specify the processes which solve ...

CISB 210   Fundamentals of Information Systems

1	0	0	0

1. identify physical flows and horizontal integration of organizational processes, and relate these flows to the relevant databases which describe the flows;

121   Personal, Leadership and IS

CISB 451   Database Administration

1	0	0	0

1. explain setting an ethical standard
2. explain the relevance and use of a professional code of ethics
3. explain and demonstrate successful application of ethical argument in identifying and evaluating alternatives based on social contextual analysis in client centered information ...

CISB 471   Advanced Information Systems

0	1	0	0

1. explain setting an ethical standard
2. explain the relevance and use of a professional code of ethics
3. explain and demonstrate successful application of ethical argument in identifying and evaluating alternatives based on social contextual analysis in client centered information ...

CISB 392   Information Systems Theory and Practice

0	1	0	0

1. explain setting an ethical standard
2. explain the relevance and use of a professional code of ethics
3. explain and demonstrate successful application of ethical argument in identifying and evaluating alternatives based on social contextual analysis in client centered information ...

122   IS Policies and Standards

CISB 451   Database Administration

1	0	0	0

1. explain the relevance of IS management aligning itself with business process
2. explain and develop standards and policies which are involved in the development of information systems of organizational scope
3. explain the benefits of cross-functional teams in policy ...

CISB 442   Systems Analysis and Design

0	1	0	0

1. explain the relevance of IS management aligning itself with business process
2. explain and develop standards and policies which are involved in the development of information systems of organizational scope
3. explain the benefits of cross-functional teams in policy ...

CISB 392   Information Systems Theory and Practice

0	1	0	0

1. explain the relevance of IS management aligning itself with business process
2. explain and develop standards and policies which are involved in the development of information systems of organizational scope
3. explain the benefits of cross-functional teams in policy ...

CISB 471   Advanced Information Systems

0	1	0	0

1. explain the relevance of IS management aligning itself with business process
2. explain and develop standards and policies which are involved in the development of information systems of organizational scope
3. explain the benefits of cross-functional teams in policy ...

125   IS Implementation and Outsourcing

CISB 451   Database Administration

1	0	0	0

1. explain outsourcing as an alternative to an internal IS function   (LO -0231)
2. define, explain, and compare from a cost-benefit perspective various outsourcing arrangements
3. manage the IS function in a small organization

CISB 471   Advanced Information Systems

0	1	0	0

1. explain outsourcing as an alternative to an internal IS function   (LO -0231)
2. define, explain, and compare from a cost-benefit perspective various outsourcing arrangements
3. manage the IS function in a small organization

CISB 210   Fundamentals of Information Systems

0	1	0	0

1. explain outsourcing as an alternative to an internal IS function   (LO -0231)
2. define, explain, and compare from a cost-benefit perspective various outsourcing arrangements
3. manage the IS function in a small organization

CISB 392   Information Systems Theory and Practice

1. explain outsourcing as an alternative to an internal IS function   (LO -0231)
2. define, explain, and compare from a cost-benefit perspective various outsourcing arrangements
3. manage the IS function in a small organization

126   Personal, Time and Relationship Management

CISB 442 Systems Analysis and Design   0   1   0   0

Discuss the differences between goal-oriented relationships and personal relationships.

CISB 451 Database Administration   0   0   1   0

 1. explain four generations of time management concepts, and personal and interpersonal reasons for the success of each stage; use the mechanisms within a project environment

Appendix C

CIS Assessment Report
2007-2014

PROGRAM ASSESSMENT REPORT

Computer Information Systems

(Instructional Degree Program)

B.S.

(Degree Level)

AYs 2007-2014

(Assessment Period Covered)

10 December 2007

(Date Submitted)

Submitted By: **Don Carpenter on behalf of CIS faculty**

(Department Head or Faculty Assessment Representative)

Expanded Statement of Institutional Purpose Linkage:

(as of Fall 2007, when this plan was created.)

Institutional Mission / College Goals Reference: The principal focus of our college's curricular program is undergraduate education in the liberal arts and sciences and a limited number of professional, technical, and graduate programs.

For Computer Information Systems – all graduates at the baccalaureate level will have developed a depth of understanding in their major field, in business supporting fields, in critical and analytical skills, and in written and oral communications appropriate to their major field.

Intended Educational (Student) Outcomes:

(as of Fall 2007, when this plan was created.)

1. Graduates will demonstrate mastery in systems theory and concepts, information technology tools, systems analysis, design and development methodologies and problem solving as applied to computer hardware, software, and networks appropriate for the bachelor's degree level.

2. Graduates will demonstrate knowledge in economics and business functions (such as accounting, business law, finance, management, marketing, and quantitative methods) as applied locally, nationally, and globally - appropriate for the bachelor's degree level.

3. Graduates will demonstrate proficiency at general and technical writing and oral communication skills appropriate for the bachelor's degree level.

4. Graduates will demonstrate proficiency at critical and analytical skills appropriate for the bachelor's degree level.

5. Graduates will demonstrate proficiency at teamwork and project management skills appropriate for the bachelor's degree level.

6. Graduates will demonstrate behaviors consistent with professionalism expected within the information systems industry.

(Please Copy and Paste to create space for additional Student Outcomes, if needed)

Intended Educational (Student) Outcome #1:

First Means of Program Assessment for Outcome #1:

1a. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will take the ICCP's Information Systems Analyst certification exam. This exam is designed to evaluate student performance on each of the learning objectives included in the IS 2002 Model Curriculum, to which the MSC CIS program adheres. Mesa State College computer information systems graduates as a group will score at or above the national 50th percent.

1a. Summary of Assessment Data Collected: From Spring 2008 through Spring 2014, all 57 CIS seniors took the ICCP exam. The average percent score overall of these students was 57.6. Of the 57 ISA exam takers, 84.2% qualified for certification as Information System Analyst at either the practitioner or mastery level

1a. Use of Results to Improve Program: Exceeded standard. The detailed results of the ICCP have been examined periodically to identify those aspects of the CIS programs that need to be improved. The CIS faculty will pay even closer attention to that in the future as the shift occurs from the IS 2002 to the IS 2010 model curriculum and from the corresponding version of the ICCP exam.

Second Means of Assessment for Outcome #1:

1b. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will be surveyed with the expectation that at least 80% will state that they feel well-prepared in necessary computer information systems knowledge and skills for an entry level position in their field.

1b. Summary of Assessment Data Collected: The Business Department discontinued the surveys of graduating seniors after Spring 2008. Consequently, only the four CIS students in CISB 471 in Spring 2008 took this survey. One respondent indicated that he felt his CIS degree program prepared him extremely well for a career; two indicated very well; and one indicated the midpoint on the scale. Hence, 75% indicated they felt well-prepared.

1b. Use of Results to Improve Program: Fell short of standard, but the sample size was too small to draw conclusive results. Since the department discontinued the use of the survey, the CIS faculty dropped this means of assessment starting in 2008-2009.

Third Means of Assessment for Outcome #1:

1c. Means of Program Assessment and Criteria for Success: In CISB 471, students will accomplish a major team-based project. The project will require them to design and construct a realistic information system. The project will include writing documentation tying the project to CIS theories, principles and practices. The project will also include writing system and user documentation and making an extensive oral presentation. Each project documentation and presentation will be evaluated by all CIS faculty using a rubric developed in AY 2006-2007. Results from the evaluations will demonstrate that students in this program are proficient with computer information knowledge and skills as well as with team participation skills by showing that at least 80% of the students earned passing scores on documentations and presentations.

1c. Summary of Assessment Data Collected: All rubrics submitted by CIS faculty and CIS emeriti faculty indicated that all CIS student teams from Spring 2008 through Spring 2014 earned passing scores on documentation and presentations.

1c. Use of Results to Improve Program: Exceeded standard. Despite the high assessment marks, CIS faculty continued to find ways to improve the capstone project and presentation experience.

Fourth Means of Assessment for Outcome #1:

1d. Means of Program Assessment and Criteria for Success: CIS alumni will be surveyed and a majority of the respondents will report they were sufficiently prepared in necessary CIS knowledge and skills for them to obtain initial employment.

1d. Summary of Assessment Data Collected: The alumni survey was conducted by the campus office of institutional research in summer 2014. The e-mailing list only contained 42 CIS graduates. However, there were 57 CIS seniors from 2008 to 2014, and 139 seniors since 2003. A very large percentage of those seniors graduated. Prior to 2003, the graduates were from the CIS concentration in the BBA program. BBA graduates will not be surveyed until the BBA program review year. Hence only a small percentage of CIS graduates were asked to participate in the survey. Only nine of the 42 alumni surveyed responded. All nine reported they were either very satisfied or generally satisfied with their undergraduate education. Four of the nine reported the CIS program prepared them for their first position. Four reported that they were unprepared. The survey did not ask what their first positions were.

1d. Use of Results to Improve Program: Fell short of standard, however the sample size was too small to draw conclusive results. Despite the disappointment with the small sample size, the CIS faculty are concerned that slightly less than half of the respondents indicated the CIS program prepared them for their first jobs. Respondents suggested areas of improvement, including more experience with collaboration tools, networking, and database administration, as well as opportunities for certification. The CIS faculty will explore all of those.

Fifth Means of Assessment for Outcome #1:

1e. Means of Program Assessment and Criteria for Success: The CIS program adheres to a national curriculum model. CISB courses in the CIS program are continuously reviewed by CIS faculty to insure the knowledge set in CIS is appropriate for CIS students to be able to achieve a mastery of CIS topics stated in the primary intended educational outcome. This review includes (1) a detailed examination of the ICCP exam results that will indicate CIS graduates will score above the 50% proficiency level on the majority of individual course objectives; (2) a survey of advisory board members and employers of CIS alumni from which the majority of respondents will indicate the CIS curriculum is appropriate to prepare students for employment.

1e. Summary of Assessment Data Collected: (1) The most recent ICCP exam report is for 2012. In that report, CMU student scored above 50% on 128 of 245 (52.2%) Learning Units. (2) A survey of advisory board members and employers was not conducted, as that falls outside the purview of the CIS faculty.

1e. Use of Results to Improve Program: (1) Exceeded standard. The CIS faculty note that the greatest area of deficiency was in programming. They have taken action to improve that situation by creating their own programming course although certain CSCI courses are also allowed. A CSCI Visual Basic course will be removed from the list, as it does not teach procedural programming. (2) The CIS faculty will remove from its assessment plans the survey of advisory board members and employers of CIS alumni, as that is not within the faculty's span of control.

Intended Educational (Student) Outcome #2:

First Means of Assessment for Outcome #2:

2a. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will take the Business MFT exam. The average score of that group will score at or above the national 50th percentile in the general business areas.

2a. Summary of Assessment Data Collected: From Spring 2008 through Spring 2014, all 57 CIS seniors took the MFT exam. The average percentile score overall of these students was 69.3 for accounting, economics, finance, legal, international issues, marketing, and management.

2a. Use of Results to Improve Program: Exceeded standard. Weaknesses in this area are certainly not apparent based on the MFT in Business, despite the fact that several of the students were in the BAS in CIS program which contained only two economics courses and no other business courses.

Second Means of Assessment for Outcome #2:

2b. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will be surveyed with the expectation that at least 80% will state that they feel well-prepared in necessary business knowledge and skills for an entry level position in their field.

2b. Summary of Assessment Data Collected: The Business Department discontinued the surveys of graduating seniors after Spring 2008. Consequently, only the four CIS students in CISB 471 in Spring 2008 took this survey. Two respondents indicated that they felt their CIS degree programs prepared him extremely well in business knowledge; one indicated very well; and one indicated the midpoint on the scale. Hence, 75% indicated they felt well-prepared.

2b. Use of Results to Improve Program: Approximately met standard, as there is no way to hit 80% with only three respondents. However, the sample size was too small to draw conclusive results. Since the department discontinued the use of the survey, the CIS faculty dropped this means of assessment starting in 2008-2009.

Third Means of Assessment for Outcome #2:

2c. Means of Program Assessment and Criteria for Success: CIS alumni will be surveyed and a majority of the respondents will report they were sufficiently prepared in necessary business knowledge and skills for them to obtain initial employment.

2c. Summary of Assessment Data Collected: The alumni survey was conducted by the campus office of institutional research in summer 2014. The e-mailing list only contained 42 CIS graduates. However, there were 57 CIS seniors from 2008 to 2014, and 139 seniors since 2003. A very large percentage of those seniors graduated. Prior to 2003, the graduates were from the CIS concentration in the BBA program. BBA graduates will not be surveyed until the BBA program review year. Hence only a small percentage of CIS graduates were asked to participate in the survey. Only nine of the 42 alumni surveyed responded. However, no survey questions were asked about preparation in necessary business knowledge and skills to obtain initial employment.

2c. Use of Results to Improve Program: The survey provided no data to use.

Intended Educational (Student) Outcome #3:

First Means of Assessment for Outcome #3:

3a. Means of Program Assessment and Criteria for Success: In CISB 471, students will accomplish a major team-based project. The project will require them to design and construct a realistic information system. The project will include documentation tying the project to CIS theories, principles and practices. The project will also include writing system and user documentation and making an extensive oral presentation. Each project documentation and presentation will be evaluated by all CIS faculty using a rubric to be developed in AY 2006-07. Results from the evaluations will demonstrate that students in this program are proficient with writing and oral communications skills by showing that at least 80% of the students earned passing scores on documentations and presentations.

3a. Summary of Assessment Data Collected: All rubrics submitted by CIS faculty and CIS emeriti faculty indicated that all CIS student teams from Spring 2008 through Spring 2014 earned passing scores on documentation and presentations.

3a. Use of Results to Improve Program: Exceeded standard. Despite the high assessment marks, CIS faculty continued to find ways to improve the capstone project and presentation.

Second Means of Assessment for Outcome #3:

3b. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will be surveyed with the expectation that at least 80% will state that they feel well-prepared in discipline-specific communication skills for an entry level position in their field.

3b. Summary of Assessment Data Collected: The Business Department discontinued the surveys of graduating seniors after Spring 2008. Consequently, only the four CIS students in CISB 471 in Spring 2008 took this survey. One respondent indicated that he felt his CIS degree program prepared him extremely well in communications skills; three indicated very well. Hence, 100% indicated they felt well-prepared.

3b. Use of Results to Improve Program: Exceeded standard, but the sample size was too small to draw conclusive results. Since the department discontinued the use of the survey, the CIS faculty dropped this means of assessment starting in 2008-2009.

Third Means of Assessment for Outcome #3:

3c. Means of Program Assessment and Criteria for Success: CIS alumni will be surveyed and a majority of the respondents will report they were sufficiently prepared in discipline-specific communications skills for them to obtain initial employment.

3c. Summary of Assessment Data Collected: The alumni survey was conducted by the campus office of institutional research in summer 2014. The e-mailing list only contained 42 CIS graduates. However, there were 57 CIS seniors from 2008 to 2014, and 139 seniors since 2003. A very large percentage of those seniors graduated. Prior to 2003, the graduates were from the CIS concentration in the BBA program. BBA graduates will not be surveyed until the BBA program review year. Hence only a small percentage of CIS graduates were asked to participate in the survey. Only nine of the 42 alumni surveyed responded. Only one question was asked on the survey about preparation in communications skills. Six respondents reported they were well prepared; two, more than adequately; one, adequately. So all 9 (100%) reported at least adequate preparation.

3c. Use of Results to Improve Program: Exceeded standard, but sample size was too small.

Intended Educational (Student) Outcome #4:

First Means of Assessment for Outcome #4:

4a. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will take Quantitative Methods portion of the Business MFT exam and as a group will score at or above the national 50th percentile.

4a. Summary of Assessment Data Collected: The quantitative methods part of MFT exam was not reported for CIS students each year as the number of CIS exam takers was too small.

4a. Use of Results to Improve Program: The CIS faculty will replace this means in future assessments.

Second Means of Assessment for Outcome #4:

4b. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will be surveyed with the expectation that at least 80% will state that feel well-prepared in critical and analytical skills.

4b. Summary of Assessment Data Collected: The Business Department discontinued the surveys of graduating seniors after Spring 2008. Consequently, only the four CIS students in CISB 471 in Spring 2008 took this survey. One respondent indicated that he felt his CIS degree program prepared him extremely well in problem solving; three indicated very well. Hence, 100% indicated they felt well-prepared.

4b. Use of Results to Improve Program: Exceeded standard, but the sample size was too small to draw conclusive results. Since the department discontinued the use of the survey, the CIS faculty dropped this means of assessment starting in 2008-2009.

Third Means of Assessment for Outcome #4:

4c. Means of Program Assessment and Criteria for Success: CIS alumni will be surveyed and a majority of the respondents will report they were sufficiently prepared in critical and analytical skills for them to obtain initial employment.

4c. Summary of Assessment Data Collected: The alumni survey was conducted by the campus office of institutional research in summer 2014. The e-mailing list only contained 42 CIS graduates. However, there were 57 CIS seniors from 2008 to 2014, and 139 seniors since 2003. A very large percentage of those seniors graduated. Prior to 2003, the graduates were from the CIS concentration in the BBA program. BBA graduates will not be surveyed until the BBA program review year. Hence only a small percentage of CIS graduates were asked to participate in the survey. Only nine of the 42 alumni surveyed responded. Only one question was asked on the survey about preparation in structure of mathematical thought and problem solving. Four respondents reported they were well prepared; two, more than adequately; three, adequately. So all nine reported at least adequate preparation, i.e. 100%.

4c. Use of Results to Improve Program: Exceeded standard, but the sample size was too small to draw conclusive results.

Intended Educational (Student) Outcome #5:

First Means of Assessment for Outcome #5:

5a. Means of Program Assessment and Criteria for Success: Students in the CISB 471 capstone course will engage in a major team project in which they will demonstrate to the CIS faculty their mastery of teamwork and project management skills by scoring at least at the 70% level on a department developed grading rubric.

5a. Summary of Assessment Data Collected: All rubrics submitted by CIS faculty and CIS emeriti faculty indicated that all CIS student teams from Spring 2008 through Spring 2014 earned passing scores on documentation and presentations.

5a. Use of Results to Improve Program: Exceeded standard. Despite the high assessment marks, CIS faculty continued to find ways to improve the capstone project and presentation

Intended Educational (Student) Outcome #6:

First Means of Assessment for Outcome #6:

6a. Means of Program Assessment and Criteria for Success: A majority of CIS majors will participate in the student chapter of the Association of Information Technology Professionals and its events, will represent Mesa State College well in national competitions, and will interact professionally with on-the-job computer information systems workers.

6a. Summary of Assessment Data Collected: Anecdotal data has been collected, which indicates that a minority of CIS majors participate in the student AITP chapter. Even fewer represent CMU in national competitions or network with CIS professionals.

6a. Use of Results to Improve Program: Fell short of standard. The CIS faculty will remove this outcome and means in future assessment processes.

Identify the significant issues/problems that came up during the Program Review.

The Computer Information Systems programs were reviewed in 2007, with an external reviewer visiting campus in October. The CIS faculty and external reviewer agreed that the strengths of the CIS programs are that the strengths of the CIS program are its students, faculty, alumni and working/educational conditions.

Inasmuch as national CIS enrollments are at the low point in the third ten year cycle, the CIS faculty and external reviewer recognized the need for continuous recruiting to minimize the impact. In addition to recruiting majors, another important strategy for increasing CIS headcount is by expanding service to other disciplines.

Several other opportunities for improvement were identified either while the CIS faculty prepared for the program review, or by the external reviewer during his visit or in his report. These are summarized in the table below.

How will these issues/problems be addressed?

The following table identifies opportunities to improve CIS programs and actions taken.

Opportunity to Improve	Action	Date
1. Increase enrollments		
Recruit more majors	Recruiting plan developed for on- and off-campus recruiting activities. Will activate after admin approval. **Approval was never granted.**	8/07 Sp08
Expand service to other disciplines	CISB 210 will be required in the BBA. Test out for CISB 101 was created. **CISB 241 & 341 also added to BBA.**	8/09 Sp08
Expand service to other disciplines	Minor in Managerial Informatics created. Conversation with other departments will follow regarding informatics. **See section 2 for service to other disciplines.**	11/07 Sp08

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Consider alternative delivery	Plan created for CIS alternative delivery. Discussion with administration to follow. **Nine courses are offered on-line**	8/07 Sp08
2. Better communicate CIS objectives	Clarify & expand this Assessment Plan. **This plan was replaced in 2013-14.**	12/07
4. Strengthen alumni relations	First CIS newsletter/survey distributed.	Su07
5. Strengthen employer relations	Industry advisory group formed and met.	Sp07
6. Errors in catalog copy	Corrections submitted for approval. **DONE.**	11/07
7. Clarify prerequisites with students.	New advising materials developed. **DONE.**	9/07
8. Define replacement schedule for specialized CIS lab.	Schedule will be created after move to new building and after impact of new course fees (effective 8/07) is known. **DONE.**	Fa08
9. Develop elective courses for CIS and other majors.	No slot for electives exists in CIS major. CIS faculty will advocate changes to structure of majors for professional programs and will develop elective courses. **DONE.**	Sp08 Sp09

Appendix D

Alumni Survey

Alumni Survey Results for Computer Information Systems Graduates - 2014											
(audience size of 42 - 9 completed survey)											
Undergraduate Degree Questions											
Overall, how satisfied are you with your undergraduate education?											
	#	%									
Very Satisfied	4	44.4%									
Generally satisfied	5	55.6%									
Ambivalent	0	0.0%									
Generally Dissatisfied	0	0.0%									
Very Dissatisfied	0	0.0%									
Based on what you know now, how well do you think your undergraduate experience prepared you to:											
	Very Well		More than Adequately		Adequately		Less Than Adequately		Very Poorly		
	#	%	#	%	#	%	#	%	#	%	
Communicate effectively in the English Language	6	66.7%	2	22.2%	1	11.1%	0	0.0%	0	0.0%	
Understand the structure and discipline of mathematical thought in problem solving	4	44.4%	2	22.2%	3	33.3%	0	0.0%	0	0.0%	
Be aware of the great philosophical issues which have endured through the ages	1	10.0%	3	30.0%	5	50.0%	1	10.0%	0	0.0%	

	Have an understanding of the multicultural nature of our world	1	11.1%	5	55.6%	3	33.3%	0	0.0%	0	0.0%
	Think critically	5	55.6%	2	22.2%	1	11.1%	1	11.1%	0	0.0%
	Have an understanding of the complexities of social systems	2	22.2%	3	33.3%	4	44.4%	0	0.0%	0	0.0%
	Have knowledge of the natural world	2	22.2%	4	44.4%	3	33.3%	0	0.0%	0	0.0%
	Appreciate the contributions of literature to our perception of the world	2	22.2%	5	55.6%	2	22.2%	0	0.0%	0	0.0%
	Appreciate the aesthetic spirit of humanity through the arts	1	11.1%	3	33.3%	5	55.6%	0	0.0%	0	0.0%
	Possess the knowledge necessary to achieve a healthy lifestyle	2	22.2%	3	33.3%	3	33.3%	1	11.1%	0	0.0%
	Acquire knowledge on your own	5	55.6%	2	22.2%	2	22.2%	0	0.0%	0	0.0%
	Be an effective leader	3	33.3%	4	44.4%	2	22.2%	0	0.0%	0	0.0%

While an undergraduate, about how often did you have conversations with faculty outside of class?

		#	%								
	Never	0	0.0%								
	Rarely (1-2 times per semester)	1	11.1%								
	Occasionally (3-5 times per semester)	3	33.3%								

	Often (once every two weeks)	1	11.1%								
	Very Often (at least once a week)	4	44.4%								
Would you encourage a current high school senior to attend CMU?											
		#	%								
	Definitely Would	7	77.8%								
	Probably Would	2	22.2%								
	Maybe	0	0.0%								
	Probably Would Not	0	0.0%								
	Definitely Would Not	0	0.0%								
	What was your undergraduate major?										
		#	%								
	CIS BS	8	88.9%								
	CIS BAS	1	11.1%								
Undergraduate Degree Questions (continued)											
In what year did you graduate from the major/certificate you chose above?											
		#	%								
	2013	0	0.0%								
	2012	2	22.2%								
	2011	1	11.1%								
	2010	2	22.2%								
	2009	1	11.1%								
	2008	2	22.2%								

		#	%									
	Other	1	11.1%									

How would you rate the overall quality of your education within that degree/certificate program?

		#	%									
		#	%									
	Very High	6	66.7%									
	High	3	33.3%									
	Average	0	0.0%									
	Low	0	0.0%									
	Very Low	0	0.0%									

Rate the CIS curriculum (program) as it prepared you to enter the job market. (1=completely prepared, 5 =completely unprepared)

		Completely Prepared		2		3		4		Completely Unprepared		
		#	%	#	%	#	%	#	%	#	%	
	Depth	0	0.0%	3	33.3%	2	22.2%	3	33.3%	1	11.1%	
	Breadth	0	0.0%	3	33.3%	2	22.2%	4	%	0	0.0%	
	Currency	1	12.5%	3	37.5%	1	12.5%	3	37.5%	0	0.0%	
	CIS program prepared you to succeed in your first position	0	0.0%	4	44.4%	1	11.1%	3	33.3%	1	11.1%	

Do you feel that the resources available to you in the CIS program were adequate? (1=completely adequate, 5=completely inadequate)

		#	%									
		#	%									
	1-Completely Adequate	2	22.2%									

	2	0	0.0%										
	3	1	11.1%										
	4	5	55.6%										
	5- Completely Inadequate	0	0.0%										
	Do you feel that the CIS program enabled you to complete your degree in a reasonable amount of time? i.e. Were courses scheduled efficiently? (1=scheduled efficiently, 5=scheduled inefficiently)												
		#	%										
	1-Scheduled Efficiently	1	11.1%										
	2	2	22.2%										
	3	1	11.1%										
	4	3	33.3%										
	5-Scheduled Inefficiently	2	22.2%										
	If you could change 2 elements of the CIS program, they would be:												
	1)												
h	Better student collaboration tools for team projects												
h	More hands-on experience with networking/servers/operating systems. The lab was not operational, in these areas, during my time in the CIS program.												
h	More database administration/server experience												
h	More classes that involve networking.												
h	Change it to be more what IT world is like.												
h	More case studies and real world scenarios												
h	more networking												
	2)												

h	More exposure to web development													
h	It should work hand-in-hand with the Computer Science program. There are many similarities that creates unnecessary duplication when pursuing both degrees.													
h	More networking courses or possible certification for networking													
h	Classes that teach about computer viruses and other troubleshooting issues.													
h	Have more team projects.													
h	Having more guest speakers talking about how IT translates in the business world and what that means. More so, how can an effective IT Business leader translate business goals into Business Rules for a system													
h	7 years ago- dont remember													
	Job and Career Questions													
	Are you working for pay right now?													
		#	%											
	Yes, work full-time	6	66.7%											
	Yes, work part-time	1	11.1%											
	No	2	22.2%											
	In what type of organization is your principal employment? Mark the one best answer.													
	Self-employed in own business or professional non-group practice								1					
	Private for profit corporation/company/group/group-practice								2					
	Higher education (public or private)								1					
	Elementary or secondary education (public or private)								0					
	International organization in the US								0					
	International organization outside of the US								0					
	US Military								0					
	Federal Government (except military)								0					

				#	%								
	State and local government, institution, or agency (except education)			1									
	Private non-profit organization (except education and international organizations)			2									
	Other -			0									
Which of the following best describes your current position?													
				#	%								
	Entry Level			0	0.0%								
	Mid-Level			5	71.4%								
	Senior Level			1	14.3%								
	Executive Level (except for chief executive)			1	14.3%								
	Chief Executive (CEO, COO, CFO, GM or principal in a business of other organization)			0	0.0%								
How many years have you been in your current job type?													
			#	%									
	Less than 3 years		3	42.9%									
	3-5 years		3	42.9%									
	6-9 years		1	14.3%									
	10 or more years		0	0.0%									
Is your current position related to your undergraduate field(s) of study?													
			#	%									
	Yes, related to major(s)		6	85.7%									
	No, not related		1	14.3%									
Job and Career Questions (continued)													

How well did CMU prepare you for your current career?											
		#	%								
Very Well		2	28.6%								
More than Adequately		2	28.6%								
Adequately		2	28.6%								
Less Than Adequately		1	14.3%								
Very Poorly		0	0.0%								
NA		0	0.0%								
What is your approximate annual gross income (before taxes)?											
		#	%								
Under $20,000		1	14.3%								
$20,000 - $29,999		0	0.0%								
$30,000 - $39,999		2	28.6%								
$40,000 - $49,999		2	28.6%								
$50,000 - $59,999		0	0.0%								
$60,000 - $74,999		1	14.3%								
$75,000 - $99,999		0	0.0%								
$100,000 - $149,999		0	0.0%								
$150,000 - $249,999		1	14.3%								
$250,000 - $499,999		0	0.0%								
Over $500,000		0	0.0%								
Comments about you work experience that will help improve CMU:											
h	Wish I had taken some sort of HR course to help me with managing people										

h	I have had to learn a great amount of database administration and some server experience that I wish I would have learned at CMU. I thank CMU for the education that I have; it has been a great asset to myself and my company.	
h	I very much enjoyed my time at CMU as a student. I learned a lot, and would not have been able to obtain my current job without my degree. I would have liked to learn more about MS Office and networking during my time. These are skills that I have used quite often in the workplace.	
h	I found that most employers want to have Network or A+ certification. I found very few jobs that wanted what I had learn in the CIS program. They want to have people that can repair computers and printers not have some one that knows how to do data bases.	
h	The program was great. However I wish I knew then what I know now. More so meaning that the job market wants you to be a good communicator and critical thinker	

Why are you not currently working for pay? (Please mark all that apply)	
	# of times checked
I chose not to enter the workforce at this time.	1
It has been difficult to find a position in my field.	1
It has been difficult to find a position paying an appropriate salary.	0
I am raising a family.	0
I am currently a student.	0
I am doing volunteer work.	1
I am retired.	1
Other	0

Education since College

Have you enrolled in a graduate, professional, or other degree/certificate program since graduating from CMU?		
	#	%
Yes	3	33.3%
No	4	44.4%

		#	%											
	No, but I plan to enroll in the next two years.	2	22.2%											
Are you enrolled in this program now?														
		#	%											
	Yes, I am a full-time student	1	33.3%											
	Yes, I am a part-time student	0	0.0%											
	No	2	66.7%											
How long after you graduated from the degree/certificate program this survey pertains to did you start this program?														
		#	%											
	Immediately (following fall or spring)	1	33.3%											
	1 Year later	2	66.7%											
	2-3 years later	0	0.0%											
	4-6 years later	0	0.0%											
	7-10 years later	0	0.0%											
	11 or more years later	0	0.0%											
Altogether, how many years have/did you attend(ed) further schooling? Mark the best answer.														
		#	%											
	None	0	0.0%											
	1 to 2 years	3	100.0%											
	3 to 4 years	0	0.0%											
	5 to 6 years	0	0.0%											
	7 to 10 years	0	0.0%											

		#	%								
	11 or more years	0	0.0 %								
How well did CMU prepare you for this educational program?											
		#	%								
	Very Well	3	100 .0 %								
	More than Adequately	0	0.0 %								
	Adequately	0	0.0 %								
	Less Than Adequately	0	0.0 %								
	Very Poorly	0	0.0 %								
	NA	0	0.0 %								
What level of education are/were you pursing?											
		#	%								
	Certificate	0	0.0 %								
	Associate	1	33. 3%								
	Baccalaureate	0	0.0 %								
	Post-Bacc Certificate	0	0.0 %								
	Master's	2	66. 7%								
	J.D.	0	0.0 %								
	Doctoral	0	0.0 %								
	Other	0	0.0 %								
In which field and program are/were you studying?											
	Business										
	Transportation Services										

		#	%									
	Management in Information Technology											
	What is the name of the College/University where you attend(ed)?											
	Colorado Mesa University											
	Western Colorado Community College											
	Regis University											
Did you complete this program?												
		#	%									
	Yes	2	66.7%									
	No	0	0.0%									
	In the process of finishing	1	33.3%									
	Other comments about furthering your education:											
	(none)											
	Suggestions for improving the degree/certificate program:											
h	Encourage students to find internships. In the IT world, employers were not only looking for education, but experience as well.											
h	More case studies and real-world events											
	Additional Comments:											
h	Thank you for everything!											
h	It was a good experience, no additional comments at this time											
	Demographic Questions											
What is your gender?												
		#	%									

	Male	5	62.5%										
	Female	3	37.5%										
	Prefer not to respond	0	0.0%										
	What is your ethnicity?												
		#	%										
	American Indian or Alaskan Native	0	0.0%										
	Asian	1	11.1%										
	Black or African American	1	11.1%										
	Hispanic of any race	0	0.0%										
	Native Hawaiian or Pacific Islander	0	0.0%										
	White	5	55.6%										
	Two or more races	2	22.2%										
	Race and ethnicity unknown	0	0.0%										
	Non-Resident Alien (of any race or ethnicity)	0	0.0%										
	Prefer not to respond	0	0.0%										
	What is your current age?												
		#	%										
	Under 21	0	0.0%										
	21-24	2	18.2%										
	25-34	5	45.5%										
	35-44	1	9.1%										
	45-54	1	9.1%										

	#	%
55 or older	2	18.2%
Prefer not to respond	0	0.0%
Do you live in the state of Colorado?		
	#	%
Yes	9	100.0%
No	0	0.0%
If yes, do you live in Western Colorado?		
	#	%
Yes	9	100.0%
No	0	0.0%

	Completely Prepared		2		3		4		Completely Unprepared	
	#	%	#	%	#	%	#	%	#	%
Depth	0	0.0%	3	33.3%	2	22.2%	3	33.3%	1	11.1%
Breadth	0	0.0%	3	33.3%	2	22.2%	4	%	0	0.0%
Currency	1	12.5%	3	37.5%	1	12.5%	3	37.5%	0	0.0%
CIS program prepared you to succeed in your first	0	0.0%	4	44.4%	1	11.1%	3	33.3%	1	11.1%

position		Likert Scale	Frequency	Product		Deviation^2	times frequency			
	Completely Prepared	1	1	1		4.2318 3673	4.23183 6735			
		2	13	26		1.1175 5102	14.5281 6327			
		3	6	18		0.0032 6531	0.01959 1837			
		4	13	52		0.8889 7959	11.5567 3469			
	Completely unprepared	5	2	10		3.7746 9388	7.54938 7755			
		15	35	107			37.8857 1429			
							1.11428 5714			
		mean	3.05 7143			std. dev.	1.05559 7326			

Appendix E

CIS Courses that Address SLO's

Catalog Descriptions, Departmental and Course Level Student Learning Outcomes for All CISB Courses

Contents in this document

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Catalog Descriptions, Departmental and Course Level Student Learning Outcomes for All CISB Courses

(Excluded are **CISB x91, x93, x95, x96** which do not have catalog descriptions and for which student learning Outcomes are established for each section taught or for each student registered.)

CISB 101

Catalog Description for CISB 101 Business Information Technology
Introduction to computing and software. Computing systems in a business environment and applicable software will be covered. Relevance of technology to society, information needs of business and management, security and lifecycle of these components will be addressed.

Institutional Student Learning Outcomes for CISB 101 Business Information Technology
Assignments in the course also reinforce the application of critical thinking skills, individual skills, communication skills, and quantitative skills.

General Education Outcomes for CISB 101
CISB 101 is a course in the General Education category of Applied Studies at Colorado Mesa University. Students are assessed to determine if the following Outcomes General Education Outcomes have been met: #5. Be able to think critically and creatively; and #6. Have an understanding of the complexities of social, economic and political systems.

Departmental Student Learning Outcomes for CISB 101 Business Information Technology
General Business Knowledge-Beginning: Remember and understand integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills-Beginning: Remember and understand the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 101 Business Information Technology
Upon completion of this course, a student should be able to explain and apply, using the campus standard software, each of the following:
1. Word processing
2. Electronic presentations
3. Spreadsheet
4. Database management system
5. File management
6. Integration of all the above.

CISB 205

Catalog Description for CISB 205 Advanced Business Software

Advanced skills in using electronic spreadsheets and database management software developed through a combination of lecture, demonstration and hands-on projects. Content ranges from using numerous functions to developing customized applications with macros in spreadsheets, and from creating tables, reports, forms and queries to creating appropriate relationships and developing customized applications in database software.

Institutional Outcome for CISB 205 Advanced Business Software

This course supports CMU's Applied Learning: Specialized Knowledge Outcome by requiring students to show competency in practical based performance that draws on current techniques and specialized knowledge in computer information systems.

Department of Business Outcomes for CISB 205

General Business Knowledge-Beginning: Remember and understand integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills-Developing: Remember and understand the proper and appropriate use of information systems tools and techniques within functional business areas

Course Student Learning Outcomes for CISB 205 Advanced Business Software

Upon completion of this course, the student should be able to demonstrate knowledge, comprehension, and application of:

1. Effectively using spreadsheets and database management software in developing and maintaining business applications.

2. Validating and protecting data in spreadsheet and database applications.

3. Recognizing appropriate tools to use for specific tasks: spreadsheet or database software.

4. Developing customized applications in spreadsheets and database software using features such as macros and switchboards.

5. Documenting applications effectively and creating professional looking applications.

6. Using lookup functions, performing conditional formats, using pivot tables, performing what-if analysis with data tables and scenario management, consolidating data from multiple worksheets using 3-D referencing, and developing templates and workspaces using spreadsheet software.

7. Preparing advanced queries and parameter queries, producing custom multi-page forms and reports, building tables, and determining appropriate table relationships using database management software.

CISB 206

Catalog Description for CISB 206 Business Database Application Programming
Continuation of CISB 205 Emphasis on solving problems through application programming in a relational database management system.

Department of Business Outcomes for CISB 206
Information Systems Skills-Beginning: Remember and understand the proper and appropriate use of information systems tools and techniques within functional business areas

Student Learning Outcomes for CISB 206 Business Database Application Programming
Upon completion of this course, the student should be able to:

1. Develop algorithms and structured code through the design of data types in a relational database.

2. Explain the differences between procedural, event-driven and object oriented programming paradigms.

3. Explain and implement modular structures; showing relation of data flow and object representations to produce code.

4. Explain the verification and validation process.

5. Compare and contrast computer programming languages. Discuss the relative capabilities and limitations of most common programming languages.

6. Demonstrate an ability to evaluate and use existing GUI components in construction of an effective user interface for an application.

7. Solve business problems through implementing simple algorithms and event driven applications within database applications.

8. Solve business problems through top-down and object implementations.

9. Demonstrate use of predefined objects in a programming environment.

10. Define ADT (abstract data types) and classes.

11. Experiment with advanced database applications.

12. Demonstrate use of SQL in a relational database.

CISB 210

Catalog Description for CISB 210 Fundamentals of Information Systems
Exploration of information systems in a business environment. Use of information systems to improve business processes and organizational goals. Introduction to hardware, software, ethical issues, career opportunities, and organizational uses of information systems.

Departmental Student Learning Outcomes for CISB 210 Fundamentals of Information Systems
General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 210 Fundamentals of Information Systems
Upon completion of this course, a student should be able to demonstrate knowledge and comprehension of:

1. Explain basic systems and information quality concepts.

2. Discuss the organizational uses of information to improve overall quality.

3. Discuss hardware, software and related information technology concepts.

4. Discuss the concepts and skills needed for the specification and design or the reengineering of organizationally related systems of limited scope using information systems.

5. Explain how information technology can be used to design, facilitate and communicate organizational goals and objectives.

6. Explain the concepts of individual decision making, goal setting, trustworthiness and empowerment.

7. Describe career paths in information systems.

8. Present and discuss the professional and ethical responsibilities of the information systems practitioner.

CISB 241

Course Description for CISB 241 Introduction to Business Analysis
Introduction to descriptive, predictive and inferential analysis techniques, data interpretation, business research skills, and techniques for analysis and modeling of business problems in the workplace.

Departmental Student Learning Outcomes for CISB 241 Introduction to Business Analysis
Critical Thinking- Beginning: Remember and understand how to apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations.

General Business Knowledge-Beginning: Remember and understand integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Analytical Skills- Beginning: Remember and understand ways to analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Student Learning Outcomes for CISB 241 Introduction to Business Analysis:
Upon completion the student will be able to demonstrate understanding of:

1. Descriptive analysis in the workplace.

2. Predictive and inferential analysis in the workplace.

3. Descriptive analysis software examples in the workplace.

4. Predictive and inferential analysis software in the workplace.

5. General business research techniques in the workplace.

6. Basic data interpretation in the workplace.

CISB 260 Information System Architecture

Catalog Description for CISB 260 Information System Architecture
Principles and applications of information systems hardware and systems software. Theoretical underpinnings, installation, configuration, and operation emphasized.

Departmental Student Learning Outcomes for CISB 260 Information System Architecture
Information Systems Skills-Beginning: Remember and understand the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 260 Information System Architecture
Upon completion of this course, the student should be able to:

1. Explain, in systems terms, the fundamental characteristics and components of computer and telecommunications hardware, and system software, and demonstrate how these components interact

2. Explain peripheral devices and their function

3. Explain the common concepts of a variety of computer hardware architectures

4. Explain the concepts of system software components and interactions

5. Explain the major concepts in operating systems, including process definition, concurrent processing, memory management, scheduling, interrupt processing, security, and file systems

6. Explain a variety of operating environments (e.g., traditional, GUI, multimedia) and resource requirements and facilities

7. Explain the requirements for interoperability and systems integration

8. Explain the installation, configuration, and operation of a multi-user operating system

CISB 305 Solving Problems Using Spreadsheets

Catalog Description for CISB 305 Solving Problems Using Spreadsheets

Critical analysis and problem solving using tools in spreadsheet. Decision support utilizing spreadsheet tools covered by hands-on cases, book tutorials and lecture materials. Structured problems, semi-structured problems and what-if scenarios explored.

Departmental Student Learning Outcomes for CISB 305 Solving Problems Using Spreadsheets

General Business Knowledge-Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Analytical Skills- Developing: Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Student Learning Outcomes for CISB 305 Solving Problems Using Spreadsheets

Upon completion of this course, the student should be able to:

1. Demonstrate effective use of spreadsheet software to demonstrate understanding of problems and to formulate, implement and evaluate solutions.

2. Demonstrate skill in using common spreadsheet software tools available to determine for making a decision what data will be needed, what data is already available, and its reliability and accuracy.

3. Demonstrate understanding of the mathematical, logical, or organizational processes required to create an effective solution to a problem, to determine what type of spreadsheet design will be best, and to decide what formulas or functions will be required to perform necessary tasks.

4. Demonstrate how to correctly and efficiently write formulas and functions found in spreadsheet tools, and how to ensure after checking results that they are correct.

CISB 306 Solving Problems Using Databases

Catalog Description for CISB 306 Solving Problems Using Databases

For students who have minimal background with databases. Assists in understanding the importance of data management in organizations through hands-on experience in solving business problems using relational database management software. Effective data analysis and effective form and report development emphasized.

Departmental Student Learning Outcomes for CISB 306 Solving Problems Using Databases

General Business Knowledge-Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Analytical Skills- Developing: Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 306 Solving Problems Using Databases:

Upon completion of this course, the student should be able to:

1. Demonstrate understanding of the importance of data management in organizations.

2. Demonstrate skill in using database software tools available to determine for making a decision about what data will be needed, what data is already available, and its reliability and accuracy.

3. Evaluate data sources and discuss data redundancy issues.

4. Demonstrate understanding of relational database concepts, and relational integrity.

5. Create and maintain tables, queries, forms, reports, macros, and pages in a relational database package.

6. Analyze data for more effective decision making.

7. Discuss common organizational issues with data such as privacy and security.

CISB 310 Enterprise Architecture

Catalog Description for CISB 310 Enterprise Architecture
Enterprise IT solutions, applications, infrastructure and fit within business organizations.

Departmental Student Learning Outcomes for CISB 310 Enterprise Architecture
General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 310 Enterprise Architecture
Upon completion of this course, students will be able to:
1. Explain a variety of frameworks for enterprise architecture analysis and decision making.
2. Evaluate the total cost of ownership and return on investment for architecture alternatives.
3. Utilize techniques for assessing and managing risk across the portfolio of the enterprise.
4. Evaluate and plan for the integration of emerging technologies.
5. Administer systems, including the use of virtualization and monitoring, power and cooling issues.
6. Manage proliferating types and volume of content.
7. Explain the core concepts of data/information architecture and evaluate existing data/information architecture designs.
8. Plan for business continuity.
9. Discuss the benefits and risks of service oriented architecture.
10. Explain the role of audit and compliance in enterprise architecture.
11. Explain the integration of enterprise systems with inter-organizational partners such as suppliers, government, etc.

CISB 315 Information Systems Infrastructure

Catalog Description for CISB 315 Information Systems Infrastructure
IS infrastructure, computer architecture, and communications networks in an organizational context.

Departmental Student Learning Outcomes for CISB 315 Information Sys. Infrastructure
General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 315 Information Systems Infrastructure
Upon completion of this course, a student will learn be able to:
1. Explain key principles of data representation and manipulation in computing solutions.
2. Explain the principles underlying layered systems architectures and their application to both computers and networks.
3. Explain the differences and similarities between the core elements of an IT infrastructure solution, such as clients, servers, network devices, wired and wireless network links, systems software, and specialized security devices.
4. Explain how IT infrastructure components are organized into infrastructure solutions in different organizational environments.
5. Explain the principles underlying service virtualization.
6. Describe through practical examples how protocols are used to enable communication between computing devices connected to each other.
7. Configure an IT infrastructure solution for a small organization, including a network based on standard technology components, servers, security devices, and several different types of computing clients.
8. Apply the core concepts underlying IP networks to solve simple network design problems, including IP sub-netting.
9. Explain the role and structure of the Internet as an IT infrastructure component and design simple infrastructure solutions based on the use of the Internet.
10. Explain the components and structure of a large-scale organizational IT infrastructure solution at a level that allows them to use it effectively.
11. Explain the role of IT control and service management frameworks in managing a large-scale organizational IT infrastructure solution.
12. Negotiate with vendors providing design and implementation solutions.
13. Explain the opportunities that virtual computing service provision models, such as cloud computing, create for organizations.
14. Analyze and explain the security and business continuity implications of IT infrastructure design solutions.

15. Configure simple infrastructure security solutions.
16. Minimize the environmental and resource consumption impacts of IT infrastructure decisions.

CISB 331 Advanced Business Programming

Catalog Description for CISB 331 Advanced Business Programming
Procedural and object-oriented software engineering methodologies using modern business languages. Emphasis on data definition and measurement, record and file processing, report generation and other traditional business information systems applications using modern methods of top-down, structured design. Other concepts include developing screen editors, abstract data types, and data structures including sequential, random and indexed files. Prerequisite: CSCI 110.

Departmental Student Learning Outcomes for CISB 331 Advanced Business Programming
Critical Thinking- Developing: Apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations.

Analytical Skills- Developing: Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Information Systems Skills- Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 331 Advanced Business Software
Upon completion of this course, the student should be able to:
1. use data as a representation and measurement of real-world events

2. use the logical and physical structure of data to represent characters, records, files, and multimedia objects

3. explain the concepts of classes, abstract data types (ADT), and objects

4. explain and illustrate formal synthetic and analytic problem solving with IS examples

5. develop an algorithmic solution to a problem and be able to represent it with appropriate program and data objects

6. demonstrate use of top-down implementation strategies

7. explain object implementation concepts

8. demonstrate use of modular design, cohesion, and coupling concepts

9. demonstrate use of a systems view of verification and validation

10. explain a variety of programming environments, development tools, and graphics development environments

11. explain a variety of data and file structures, with simple examples

12. explain how to develop structures using abstract data types representing arrays, lists, trees, records, and files, and demonstrate how they are applied as components of programs and applications

13. explain index file structures, including key organizations

14. explain a variety of fundamental structures that are building blocks for the development of programs and IS applications

15. explain applications of data structures and file processing techniques

16. solve problems involving files and explain database representations

17. develop useful structured file (database) editors, posting mechanisms, and reports (simple, control break)

18. demonstrate use of a variety of programming techniques, particularly in the design, testing, and debugging of IS related programs of some complexity

19. explain the relative capabilities and limitations of most common programming languages

CISB 341

Catalog Description for CISB 341 Quantitative Decision Making

Application of inferential statistics to realistic business situations; use of quantitative tools to enhance business decision-making ability. Descriptive statistics for data summarization, probability theory, distributions, estimation, and index numbers with emphasis on hypothesis testing, analysis of variance, regression/correlation, time series, and introduction to operations research and linear programming.

Departmental Student Learning Outcomes for CISB 341 Quantitative Decision Making

Critical Thinking- Developing: Apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations.

General Business Knowledge-Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Analytical Skills- Developing: Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Course Student Learning Outcomes for CISB 341 Quantitative Decision Making

Upon completion of this course, the student should be able to:

1. apply descriptive statistics to business situations to include analysis and presentation of results

2. apply quantitative methods to improve business decisions involving risk

3. effectively evaluate risk in a business venture using methods from probability theory?

4. compute and interpret index numbers and to deflate future values using tools such as the consumer price index and rate of inflation

5. demonstrate use of inferential statistics to test business hypotheses using sample data

6. demonstrate use of analysis of variance to identify the source of variability in a process

7. apply the tools of regression and correlation to decipher trends in data and to perform data decomposition to identify the component parts

8. apply linear programming techniques to solve maximization and minimization problems in two or more variables

CISB 392   NO LONGER BEING REQUIRED/TAUGHT

Catalog Description for CISB 392 Information System Theory and Practice

Exploration and application of Information System theory for organizational success. Examination of managerial, user, and IS professional roles within information systems.

No Dept level objectives included because it will not be taught in the future...

Course Student Learning Outcomes for CISB 392 Information System Theory and Practice

Upon completion of this course, the student should be able to:

1. Discuss and describe concepts of IS theory and its importance to practitioners.

2. Show how an information system is a strategic and integral component of an organization.

3. Discuss how an information system is developed and managed within an organization.

4. Present and discuss the relevance of the cognitive process and human interactions in information system design and implementation. .Discuss how individuals make decisions and set and achieve goals, and describe the Simon Model of organizational decision making and its support by IS.

5. Discuss systems theory, quality, and organizational modeling and demonstrate their importance to information systems.

6. Discuss a systems based role for managers, users and designers.

7. Explain physical systems and work flow and how information systems relate to organizational systems.

8. Present other organizational models and their relevance to IS.

9. Discuss the relationship of IS planning to organizational planning.

10. Demonstrate specific classes of application systems including TPS and DSS.

11. Discuss and examine the process, standards, and policies for development of information systems: development methodologies, life cycle, workflow, OOA, prototyping, spiral, end-user and other approaches.

12. Discuss outsourcing and alternate implementations of the IS function.

13. Discuss performance evaluation consistent with quality management and continuous improvement.

14. Describe the societal implications of IS and related ethical issues, ethical issues relating to personal and professional behavior, a variety of ethical approaches and models, and the nature and existence of power.

15. Explain ethical and legal principles and issues, ethical considerations of information system development, planning, implementation, usage, sales, distribution, operation, and maintenance.

16. Explain issues relative to managing the information system functions.

CISB 400 Data Communications and Network Management

Catalog Description for CISB 400 Data Communications and Network Management

Exploration of modern telecommunication and networking technologies. Issues related to network media, including cost, design and management of LANs and WANs addressed. How networks and networking provide and enhance business communications. Networking standards, standards organizations, security, privacy, installation and configuration issues will be in classroom discussions with hands-on assignments. Prerequisite: TECI 260 or CISB 300.

Departmental Student Learning Outcomes for CISB 400 Data Communications and Network Management

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 400 Data Communications and Network Management

Upon completion of this course, the student should be able to:

1. demonstrate knowledge of associated terminology of the different objects, media, and devices necessary for telecommunications, including local (LAN) and wide area (WAN) networks

2. demonstrate knowledge of how telecommunication systems are used to support organizational communication infrastructure including information systems, teleconferencing, and telecommuting

3. explore the issues related to the economics, design, and management of computer networks

4. demonstrate knowledge of telecommunication standards and with regulatory organizations and their standards

5. discuss and explain underlying principles and issues of distributed versus centralized computer systems

6. present architectures, topologies, and protocols of telecommunications

7. present the hardware and software components of telecommunications systems and how they are organized to provide required services

8. demonstrate knowledge of the responsibilities inherent in providing telecommunication services, including security, privacy, reliability, and performance

9. explain how to install equipment necessary to implement a telecommunication system, e.g. cable, modems, Ethernet connections, gateways, and routers

10. explain how to design, install, configure, and manage a LAN

11. discuss issues pertinent to the management and transfer of emerging technologies

CISB 410 Project Management

Catalog Description for CISB 410 Project Management

Processes, techniques and tools of project management. Evaluating, initiating, planning, staffing, executing, controlling, and closing projects using project management software.

Departmental Student Learning Outcomes for CISB 410 Project Management

General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 410 Project Management

Upon completion of this course, students should be able to:
1. Explain how to initiate, specify, prioritize projects, and measure feasibility of projects.
2. Explain foundations of project management, including definition, scope, and need in organizations.
3. Discuss the phases of the project management lifecycle.
4. Discuss how to manage project teams, including fundamentals of leadership and team motivation.
5. Explain how to manage internal and external project communications.
6. Explain how to initiate projects, including project selection and defining project scope.
7. Demonstrate management of project schedules with appropriate techniques and tools.
8. Manage project resources, including human resources, capital equipment, and time.
9. Measure and manage project quality.
10. Measure and manage project risk.
11. Manage the project procurement process, including external acquisition and outsourcing.
12. Monitor and manage project execution, including progress, change, and documentation.
13. Control projects through information tracking and cost and change control techniques.
14. Close projects, including administrative, personnel, and contractual closure.
15. Discuss mechanisms for dealing with legal issues in complex project contexts.
16. Explain ethnic cultural differences in working with global teams.
17. Discuss project management certification programs.

CISB 442

Catalog Description for CISB 442 Systems Analysis and Design
Analysis and logical design of information systems. Practice in project management during team-oriented analysis and design of a departmental level system.

Departmental Student Learning Outcomes for CISB 442 Systems Analysis and Design
Critical Thinking- Developing: Apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations.

Individual and Team Skills-Developing: Produce professional work products independently and collaboratively.

Communication Skills-Developing: Communicate clearly, appropriately, and persuasively to the audience both orally and in writing.

Analytical Skills- Developing: Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Information Systems Skills- Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 442 Systems Analysis and Design
Upon completion of this course, the student should be able to:

1. discuss necessary concepts and possess the skills necessary to do the analysis, modeling, and definition of information systems problems

2. demonstrate use of commercial program products to implement information systems

3. collect and structure information in the development of requirements and specifications

4. develop a logical design, and develop and analyze alternatives involving implementation using packages, tailoring of packages, constructing software, or CASE tools

5. develop a rapid prototyping and other similar alternative mechanisms for rapid development of information systems

6. assess risks and feasibility

7. analyze organizational systems to determine how the systems might be improved

8. demonstrate skills for effective interpersonal communication to develop consensus using classical techniques as well as computer facilitated groupware

9. demonstrate small group dynamics as related to working with users

10. demonstrate application skills for implementing databases and applications by operating and testing these databases

11. demonstrate use of complexity metrics to assess developed solutions

12. demonstrate use of quality metrics for assessment of software development and project control of software development

13. demonstrate use of quality metrics for assessment of customer satisfaction at all phases of the life cycle

14. apply a professional code of ethics to evaluate specific IS actions

15. explain a systems view of object representation and compare it with data flow models demonstrate a functional understanding of proactive principled behavior and time management

16. demonstrate attitudes necessary for successful team behavior including empathetic listening, consensus negotiation, conflict resolution, and synergistic solution finding, and to apply the concept of commitment and rigorous completion

17. demonstrate goal setting and alignment of team activities with project obligations

18. describe interactions with higher levels of management in selling project Outcomes and performing project management tasks

19. describe and explain life cycle concepts, and apply them to the course project

CISB 451

Catalog Description for CISB 451 Database Administration
Continuation of CISB 442 Systems Analysis and Design. Covers development and implementation of conceptual and detailed physical system design using proper database tools and methods.

Departmental Student Learning Outcomes for CISB 451 Database Administration
General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills- Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 451 Database Administration
Upon completion of this course, the student should be able to:

1. articulate the importance of finding synergistic solutions with team and clients

2. construct agreements describing work to be done, and commit, complete and evaluate that work

3. demonstrate skills in data modeling of databases

4. demonstrate knowledge of the syntactical and theoretical differences among database models

5. demonstrate skills in database systems development and retrieval facilities needed to facilitate creation of information system applications

6. demonstrate skills in application and structuring of database management systems

7. demonstrate skills in application and physical implementation of database systems, using a programming environment

8. demonstrate skills in the use of a combination of code generators and language facilities to implement multi-user departmental or simple enterprise level systems

9. demonstrate use of project management, project standards, a system implementation plan, and a documentation plan

10. construct a conceptual data model and logical database model, convert the logical database designs to physical designs, develop the physical database, and generate test data

11. develop functional specifications for an information system, develop a detailed information system design, and develop information system application controls

12. develop a conversion and installation plan, develop a hardware systems and environmental plan

13. articulate detailed program specifications, develop programs, set up system test parameters, install, and test the new system, implement the conversion plan, employ configuration management

14. articulate how to develop a physical work-flow plan with a client

15. articulate how to present a system design, test plan, implementation plan, and evaluation, in written and oral form

16. articulate systems performance evaluation consistent with quality management and continuous improvement

CISB 460 Electronic Commerce Systems

Catalog Description for CISB 460 Electronic Commerce Systems
Comprehensive examination of electronic commerce, how it is conducted and managed, and its opportunities, limitations, issues, and risks. Coverage of technological infrastructure that supports e-commerce systems, plus the implications of such systems in the business environment. Exercises include exploration of e-commerce web sites and features, plus discussion and demonstration of state-of-the-art e-commerce tools.

Departmental Student Learning Outcomes for CISB 460 Electronic Commerce Systems
General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 460 Electronic Commerce Systems
Upon completion of this course, the student should be able to:

1. demonstrate knowledge of organizational value and supply chain concepts, and distinguishing characteristics of traditional versus evolving organizations utilizing internet technologies.

2. demonstrate knowledge of and distinguish between types of e-commerce business relationship types including B2B, B2C, B2G, C2C, C2G, G2G.

3. demonstrate knowledge of and explain value and supply chain concepts and examples with respect to evolving e-commerce business relationships.

4. demonstrate knowledge of consumer issues that are frequently solved in e-commerce systems including shopping carts, human computer interface designs, interactions with payment processing mechanisms, and relationships to information technology development and support.

5. demonstrate knowledge of concepts and specific examples of e-commerce functionality found in common business relationships.

6. demonstrate knowledge of and explain ethical, contractual, and regulatory issues involving domestic and trans-border interactions involving interorganizational business relationships.

7. demonstrate knowledge of, discuss, and explain hardware and software system components commonly utilized in implementation of inter-organizational systems.

8. demonstrate knowledge of, develop, explore, and illustrate the nature and use of IS development methodologies in an interorganizational setting, and to discuss responsibilities at all life cycle stages.

9. explain the obligations for protection of individual privacy as well as organizational security in interorganizational systems.

CISB 470 Management of Information Systems

Catalog Description for CISB 470 Management of Information Systems

Reviews the development of an overall framework for analyzing the use of information by organizations along with examples of different types of information systems. The conceptual foundations of information systems and the development, operation, management, uses, parties, control, structure, and impact of these systems will be addressed. The analysis and design of information systems is stressed through case study and projects, emphasizing the role of computing in information systems and design of computer-based systems, expert systems, decision support systems and executive information systems.

Departmental Student Learning Outcomes for CISB 470 Management of Information Systems

General Business Knowledge – Developing: Apply and analyze integrated knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.

Information Systems Skills – Developing: Apply and analyze the proper and appropriate use of information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 470 Management of Info Systems

Upon completion of this course, each student should be able to demonstrate understanding of:

1. The importance of information systems management.

2. The role of the top manager of information systems.

3. Strategic uses of information technology.

4. The importance of strategic planning for information systems.

5. Best practices in managing computer hardware and software.

6. Best practices in managing telecommunications and distributed processing.

7. Best practice in managing information resources.

8. Best practices for aligning and managing operations.

9. Best practices for developing systems.

10. Management issues in system development.

11. The role of information systems in supporting decision making.

12. The role of information systems in supporting collaborative work.

13. The role of information systems in supporting knowledge work.

14. The impact of technology on human resources.

15. Integration and deployment of emerging technologies.

CISB 471 Advanced Information Systems

Catalog Description for CISB 471 Advanced Information Systems

Capstone course for the BS in CIS. Integrates management information needs, decision-making criteria, and design of interactive user interfaces. Design and development of computerized management control systems for major functional modules of an organization investigated, utilizing database management systems, distributed processing and structured systems development. Overall CIS management. Demonstrations of knowledge and skills learned in all prerequisite courses.

Departmental Student Learning Outcomes for CISB 471 Advanced Information Systems

Critical Thinking- Advanced: Evaluate and create the application of knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations.

Individual and Team Skills-Advanced: Produce professional work products independently and collaboratively.

Communication Skills-Advanced: Communicate clearly, appropriately, and persuasively to the audience both orally and in writing.

General Business Knowledge- Advanced: Evaluate and create integrated business knowledge from multiple functional areas of business to solve business problems and to develop sound conclusions.

Analytical Skills- Advanced: Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions.

Information Systems Skills- Advanced: Evaluate and create proper and appropriate information systems tools and techniques within functional business areas.

Course Student Learning Outcomes for CISB 471 Advanced Information Systems

Upon completion of this course, the student should be able to:

1. analyze, design, and develop application software using a programming environment

2. identify a structured, event-driven, or object-oriented application design and explain the implications of these approaches to the design and development process

3. develop program tests and system tests

4. identify the different programming environments available for business application development

5. demonstrate a functional understanding of proactive principled behavior and time management

6. demonstrate attitudes necessary for successful team behavior including empathetic listening, consensus negotiation, conflict resolution, and synergistic solution finding, and to apply the concept of commitment and rigorous completion

7. demonstrate goal setting and alignment of team activities with project obligations

8. describe interactions with higher levels of management in selling project Outcomes and performing project management tasks

9. describe and explain life cycle concepts, and apply them to the course project

10. discuss and apply the concept of life-long learning

11. explain the evolving leadership role of information management in organizations

12. explain and utilize the concepts of re-engineering and continuous improvement

13. explain ethics and principled behavior and the concept of ethical practice in CIS

CISB 500   Graduate (Dept. Level SLOs not yet determined)

Catalog Description for CISB 500 Management of Information Systems
Reviews the development of an overall framework for analyzing the use of information by organizations along with examples of different types of information systems. The conceptual foundations of information systems and the development, operation, management, uses, parties, control, structure, and impact of these systems will be addressed. The analysis and design of information systems is stressed through case study and projects, emphasizing the role of computing in information systems and design of computer-based systems, expert systems, decision support systems and executive information systems.

Course Student Learning Outcomes for CISB 500 Management of Information Systems
Upon completion of this course, each student should be able to demonstrate understanding of:

1. The importance of information systems management.
2. The role of the top manager of information systems.

3. Strategic uses of information technology.

4. The importance of strategic planning for information systems.

5. Best practices in managing computer hardware and software.

6. Best practices in managing telecommunications and distributed processing.

7. Best practice in managing information resources.

8. Best practices for aligning and managing operations.

9. Best practices for developing systems.

10. Management issues in system development.

11. The role of information systems in supporting decision making.

12. The role of information systems in supporting collaborative work.

13. The role of information systems in supporting knowledge work.

14. The impact of technology on human resources.

15. Integration and deployment of emerging technologies.

16. Research and write a scholarly paper on a management of information systems topic which is worthy of publication in a conference proceedings or journal.

CISB 505 Advanced Project Management (Graduate, Dept. SLOs not yet determined)

Catalog Description for CISB 505 Advanced Project Management

Processes, techniques and tools of project management. Evaluating, initiating, planning, staffing, executing, controlling, and closing projects using project management software. Projects, writing, and presentation to demonstrate mastery at the graduate level.

Course Student Learning Outcomes for CISB 505 Advanced Project Management

Upon completion of this course, students should be able to:

1. Explain how to initiate, specify, prioritize projects, and measure feasibility of projects.
2. Explain foundations of project management, including definition, scope, and need in organizations.
3. Discuss the phases of the project management lifecycle.
4. Discuss how to manage project teams, including fundamentals of leadership and team motivation.
5. Explain how to manage internal and external project communications.
6. Explain how to initiate projects, including project selection and defining project scope.
7. Demonstrate management of project schedules with appropriate techniques and tools.
8. Manage project resources, including human resources, capital equipment, and time.
9. Measure and manage project quality.   10. Measure and manage project risk.
11. Manage the project procurement process, including external acquisition and outsourcing.
12. Monitor and manage project execution, including progress, change, and documentation.
13. Control projects through information tracking and cost and change control techniques.
14. Close projects, including administrative, personnel, and contractual closure.
15. Discuss mechanisms for dealing with legal issues in complex project contexts.
16. Explain ethnic cultural differences in working with global teams.
27. Discuss project management certification programs.
18. Use Microsoft Project to demonstrate mastery of all the above objectives at the graduate level by managing a realistic project agreed to by the instructor.

CISB 560   Electronic Commerce Systems , Graduate Course, Dept Level SLOs not yet determined

Catalog Description for CISB 560 Electronic Commerce Systems

Comprehensive examination of electronic commerce, how it is conducted and managed, and its opportunities, limitations, issues, and risks. Coverage of technological infrastructure that supports e-commerce systems, plus the implications of such systems in the business environment. Exercises include exploration of e-commerce web sites and features, plus discussion and demonstration of state-of-the-art e-commerce tools.

Course Student Learning Outcomes for CISB 560 Electronic Commerce Systems

Upon completion of this course, the student should be able to:

1.   demonstrate knowledge of organizational value and supply chain concepts, and distinguishing characteristics of traditional versus evolving organizations utilizing internet technologies.

2.   demonstrate knowledge of and distinguish between types of e-commerce business relationship types including B2B, B2C, B2G, C2C, C2G, G2G.

3.   demonstrate knowledge of and explain value and supply chain concepts and examples with respect to evolving e-commerce business relationships.

4.   demonstrate knowledge of consumer issues that are frequently solved in e-commerce systems including shopping carts, human computer interface designs, interactions with payment processing mechanisms, and relationships to information technology development and support.

5.   demonstrate knowledge of concepts and specific examples of e-commerce functionality found in common business relationships.

6.   demonstrate knowledge of and explain ethical, contractual, and regulatory issues involving domestic and trans-border interactions involving inter-organizational business relationships.

7.   demonstrate knowledge of, discuss, and explain hardware and software system components commonly utilized in implementation of inter-organizational systems.

8.   demonstrate knowledge of, develop, explore, and illustrate the nature and use of IS development methodologies in an inter-organizational setting, and to discuss responsibilities at all life cycle stages.

9.   to explain and consider the obligations for protection of individual privacy as well as organizational security in inter-organizational systems.

10. Research and write a scholarly paper on an electronic commerce systems topic which is worthy of publication in a conference proceedings or journal.

Appendix F

CIS Assessment Plan

COLORADO MESA UNIVERSITY
Program Outcome and Assessment Plan Template
Program Name: Bachelor of Science in Computer Information Systems
Date: September 2013

Program Outcomes	Courses/Educational Strategies Indicate if outcome is Beginning(B), Developing(D) or Advanced(A)	Assessment Method(s)	Time of Data Collection/ Person Responsible	Desired Level of Accomplishment/ Benchmark	Results of Assessment	Actions Taken
Outcome #1 Demonstrate a mastery of the computer information systems body of knowledge appropriate for the bachelor's degree level. (Specialized Knowledge – information systems)	CISB 206 (or equivalent), 260, 305, 306 at the B level; CISB 205, 310, 315, 331, 400, 410, 442, 451, 460, and 470 at the D level; CISB 471 at the A level.	**What:** Information Systems Analyst Exam which aligns to the IS model curriculum, the basis for CIS at CMU. **How:** ISA Exam is distributed by ICCP. It is administered in CISB 471, a spring semester class.	**Who:** Professors of CISB 471 **When:** ISA Exam will be given in CISB 471 in the middle of each spring semester.	The benchmark is that at least 50% of CMU CIS students will qualify for ISA-Practitioner certification. That qualification requires an average score of 50 on the two parts of the ISA Exam.	**Results:** **Key Findings:** **Conclusions**	**Action:** Re-evaluation Date:
Outcome #2 Apply knowledge and skills in appropriate contexts and transfer knowledge and skills to new situations. (Critical thinking)	FINA 301 (D) CISB 471 (D)	**What:** Projects in FINA 301 and CISB 471 **How:** Departmental rubric evaluated by faculty jury	**Who:** Professors of FINA 301 and CISB 471 **When:** Data will be collected on a sample basis each semester class is taught from all sections.	For FINA 301, students should score at the developing level or above. For CISB 471, 80% of students should score at the proficient level.	**Results:** **Key Findings:** **Conclusions**	**Action:** Re-evaluation Date:
Outcome #4 Analyze business data critically, reason logically, and apply quantitative analysis methods correctly to develop appropriate conclusions. (quantitative fluency)	FINA 301 (D) CISB 471 (D)	**What:** Projects in FINA 301 and CISB 471 **How:** Departmental rubric evaluated by faculty jury	**Who:** Professors of FINA 301 and CISB 471 **When:** Data will be collected on a sample basis each semester class is taught for all sections.	For FINA 301, students should score at the developing level or above. For CISB 471, 80% of students should score at the proficient level.	**Results:** **Key Findings:** **Conclusions**	**Action:** Re-evaluation Date:
Outcome #5 Produce professional work products, independently and collaboratively.	FINA 301 (D) CISB 471 (D)	**What:** Individual and/or group projects in FINA 301 and CISB 471 **How:** Departmental rubric evaluated by faculty jury	**Who:** Professors of FINA 301 and CISB 471. **When:** Data will be collected on a sample basis each semester class is taught for all sections.	For FINA 301, students should score at the developing level or above. For CISB 471, 80% of students should score at the proficient level.	**Results:** **Key Findings:** **Conclusions**	**Action:** Re-evaluation Date:

Outcome #6 Integrate knowledge from multiple functional areas of business to solve business problems and to develop sound business strategies.	FINA 301 (D) CISB 471 (D)	**What:** 1. Individual and/or group projects in FINA 301 and CISB 471 2. MFAT **How:** 1. Department rubric evaluated by faculty jury 2. MFAT conducted Fall and Spring	**Who:** 1. Professors of FINA 301 and CISB 471. **When:** 1. Data will be collected on a sample basis each semester class is taught for all sections.	1. For FINA 301, students should score at the developing level or above. For CISB 471, 80% of students should score at the proficient level.	**Results:** **Key** **Findings:** **Conclusions**	
Outcome #7 Properly and appropriately use information systems tools and techniques within functional business areas.	FINA 301 (D) CISB 471 (D)	**What:** Individual and/or group projects in FINA 301 and CISB 471 **How:** Departmental rubric evaluated by faculty jury	**Who:** Professors of FINA 301 and CISB 471. **When:** Data will be collected on a sample basis each semester class is taught for all sections.	For FINA 301, students should score at the developing level or above. For CISB 471, 80% of students should score at the proficient level.	**Results:** **Key** **Findings:** **Conclusions**	

External Program Review

Colorado Mesa University

Computer Information Systems

Conducted by

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Program Review
Computer Information Systems (CIS)
Colorado Mesa University (CMU)
Grand Junction, CO

Report of External Reviewer; based on site visit of Mon, Mar 16, 2015

Prior to the site visit, the reviewer perused electronic files sent by the Assistant VP of Academic Affairs. Of particular interest was the well-written and thoughtful Program Review Self-Study conducted by the CIS Department, covering the period 2008 – 2014. The external reviewer then visited the campus on Mar 16, 2015, holding discussions with the Provost, Department Head, CIS program faculty, and selected University staff, students, and alumni.

Executive Summary Narrative (see also the Table 1 Executive Summary)

The program is vibrant and is serving the basic needs of the Department and students. It has benefitted from a relatively stable team of dedicated and diligent tenured/tenure track and full-time faculty, who (largely with the growing `help of course-by-course lecturers) have doubled the number of student credit hours delivered over the past 5 years to fill an expansion of course demands from non-CIS majors. This is particularly commendable given that course content in Information Systems becomes outdated more rapidly than in some fields due to technological advancements in computer hardware and software. Employability of graduates is expected to continue to be strong.

At the same time, the Program faces some challenges and may benefit from some attention in certain areas, as outlined below. If it is desired to maintain the major at its current scale, recommendations are limited to relatively minor changes in curricula. Further recommendations relate to a possible strengthening of the attractiveness of the major to draw more students into the program so that it reaches a more favorable scale. This would at the same time enhance the delivery of course content to non-CIS majors.

Recommendations:

1) **Fine-tune the curricula** (items are listed below in order of priority, from highest to lowest):

   a. Expand student familiarity with enterprise software (e.g., SAP). Plans are reportedly in place to achieve this.
   b. Continue to encourage programming skills in graduates of the CIS major. While the CIS major is not designed to train students for a career in computer programming, most companies do expect CIS graduates to be able to understand coding principles and communicate effectively with software development teams. Current program requirements give students the option of choosing between Business DB App Programming (CISB 206), Beginning Programming (CSCI 110) or Foundations of Computer Science (CSCI 111). Note: One of the notable revisions to the IS 2010 curricula was the removal of application programming from the core requirements for the CIS undergraduate major. However, this change is likely to be the subject of considerable debate for the foreseeable future.
   c. Map CSCI 110 and CSCI 111 to stated learning objectives for the CIS major. Although there is a close relationship between information systems and other computing disciplines, there are also significant differences in terms of scope and approach. Since CSCI 110 and CSCI 111 are possible choices for satisfying core requirements for the CIS major at CMU, it would be helpful to include an analysis of differences between these courses in program review materials. Advising staff for the CIS major likely help students to navigate any differences. It would be helpful to also see this articulated in program materials.
   d. Expand the course description for CISB 206 to give students additional detail about what will be covered in the course. Current program requirements give students the option of choosing between Business DB App Programming (CISB 206), Beginning Programming (CSCI 110) or Foundations of Computer Science (CSCI 111). The catalog description for the CISB 206 course is too limited. Excellent learning objectives have been

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developed and incorporated into the prior program review document. Some of these learning objectives should be included in the course description.

    e. Re-run the Center for Computing Education Research report included in the 2014 program review document and map current courses to the IS 2010 model curriculum instead of IS 2002.

    f. Expand CISB 451 to include coverage of both RDBMS and NoSQL database technologies.

    g. Provide students with an introduction to "Big Data Analytics". This will be an important component of your curriculum should AACSB accreditation be pursued in the coming years. This can be done as a standalone course or as part of two of your existing courses (CISB 241 and CISB 310). CISB 241 should introduce some of the analytical considerations for big data, and CISB 310 should introduce architectural demands of working in a big data world.

    h. CISB 331 (Advanced Business Programming) covers COBOL, Simulation, Java, HTML, CSS, PHP and MySQL. The course appears to cover scripting techniques; consider also adding Python and Visual Basic to the course.

    i. Add a course in IS Strategy, Management and Acquisition to the CIS major core requirements. This is one of the 7 areas recommended in the IS 2010 model curriculum.

    j. Consider enhancing the elective offerings (once additional students and faculty resources are available) in areas such as IT security, mobile application development, data center management and cloud infrastructure and services.

2) **Enhance the attractiveness of the CIS major, with the intent to double the number of yearly graduates, to say 25** (items are listed below in order of priority, from highest to lowest):

    a. Staff the CISB 210 course with dynamic instructors (preferably tenured/tenure track or full-time faculty) to insure that students with the interest and aptitude will be drawn into the CIS major.

    b. Identify within the faculty a Program Director with responsibility for the activities identified in the following points (some teaching relief will be needed to accommodate these responsibilities).

    c. Produce a brochure promoting favorable aspects of the CIS major such as the job prospects for CIS graduates, including both internships and full-time opportunities.

    d. Form an Advisory Board comprised of IT professionals in Grand Junction and the Front Range, meeting once per semester (Fall and Spring) to facilitate feedback and form contacts for internships and jobs.

    e. Seek STEM approval of CIS degree programs with U.S. Immigration and Customs Enforcement to encourage more enrollments from international students. STEM approval will allow students to apply for a 17-month STEM extension of their post-completion OPT (Optional Practical Training).

    f. Consider expanding international outreach initiatives, such as engaging in online forums for prospective international students, appointing an international student ambassador within the Business School or University, and establishing relationships with companies that hire international students.

    g. Consider innovative ways to deliver an expanded offering of highly technical content without committing to costly personnel hires. For example, outside faculty might be brought in for an intensive two-week course.

    h. Seek accreditation in conjunction with the Business Department's pursuit of AACSB accreditation (or independently via ABET accreditation, within the Computing Accreditation Commission).

    i. Continue with (and possibly expand) participation in nationwide competitions.

    j. Consider the costs/benefits of launching an AIS (Assoc. for Info. Sys.) vs. AITP Assoc. of Info. Tech. Professionals) student chapter at CMU. There are benefits to both organizations. AIS has historically been more academically focused, whereas AITP is a professional association. Involvement in AIS will likely benefit students who desire to pursue a more research-oriented career path. There are a variety of different case competitions also offered by both organizations.

    k. Assuming the growth materializes, expand the full time faculty (tenured/tenure track or career-line) by one or two members.

Table 1. Executive Summary of External Reviewer's Observations (CIS, Mar 16, 2015)

Program Review Element	Check the appropriate selection				Provide explanation if not agree with element and/or why unable to evaluate
	Agree	Not Agree	Unable to Evaluate	Not Applicable	
The program's self-study is a realistic and accurate appraisal of the program.	X				
The program's mission and its contributions are consistent with the institution's role and mission and its strategic goals.	X				
The program's goals are being met.	X				
The curriculum is appropriate to the breadth, depth, and level of the discipline.		X			The curriculum can benefit from adjustments as outlined in the recommendations.
The curriculum is current, follows best practices, and/or adheres to the professional standards of the discipline.	X				
Student demand/enrollment is at an expected level in the context of the institution and program's role and mission.		X			The major suffers from diseconomies of its small scale. A doubling (to 25 graduates/yr) seems achievable.
The program's teaching-learning environment fosters success of the program's students.	X				
Program faculty members are appropriately credentialed.	X				
Program faculty members actively contribute to scholarship, service and advising.	X				
Campus facilities meet the program's needs.	X				
Equipment meets the program's needs.	X				
Instructional technology meets the program's needs.	X				
Current library resources meet the program's needs.	X				
Student learning outcomes are appropriate to the discipline, clearly stated, measurable, and assessed.	X				
Program faculty members are involved in on-going assessment efforts.	X				
Program faculty members analyze student learning outcome data and program effectiveness to foster continuous improvement.	X				
The program's articulation of its strengths and challenges is accurate/ appropriate and integral to its future planning.	X				

University, Business Department, and CIS Overview

The verbiage in this section is intended to illustrate general trends rather than be definitive in detail; some numbers are crude estimates and should be confirmed before being used for related decisions. This background information and larger overview is offered only to frame the context within which the CIS recommendations are made.

CMU has seen significant growth in enrollment and in facilities over the past decade (for example, growth of roughly 1,000 students over the past three years). Commensurate with this growth (and to facilitate it) has come expansion of dorms, classrooms and other buildings, such that campus facilities are now generally first-rate. The attractive campus draws students not only from the 14-county surroundings but is now beginning to also attract more students from the Colorado Front Range (from Ft. Collins down through Denver to Colorado Springs).

The Business Department graduates the most students at CMU, with Management and Marketing reflecting the highest volume followed by Accounting and Finance (due in part to needs for graduates in Banking, for example). Another program with significant numbers at CMU is the Nursing BSN, which has a strong National reputation and can now be completed partially if not fully on-line. The Criminal Justice program is also growing in stature and numbers of graduates.

At the same time that growth has been experienced within the University, the University's funding model has evolved dramatically. A decade or more ago funding came primarily from the State coffers, with possibly 20% coming from other sources. The ratio has now roughly reversed, with 20% coming from State funding and 80% from other sources; mostly tuition. This has followed a National trend – tuitions have risen much faster than inflation with the increases in many cases due primarily to loss of State funding.

CMU has aggressively fought the tuition trend through, for example, taking advantage of the economies of scale that stem from increased enrollments. Additionally, in the CIS area, costs have been held down by meeting demand through hiring of course-by-course instructors. Tenure-track faculty size has not grown at nearly the rate that Student Credit Hours (SCHs) have been delivered – this has been achieved over the past five years by increasing average class size by 22% (going from 18 to 22) and by roughly doubling the fraction of SCHs taught by course-by-course instructors (from 28% to 55%), who cost the University substantially less than a tenure-track Professor (maybe one-fourth the cost or less, but with some "coordination cost" on the part of the Business Department). The fraction of courses taught by tenured/tenure track and full time CIS faculty (whose standard teaching course load is four courses per semester) has dropped from 72% to 45% over the past five years – they continue to teach most if not all the upper level courses required for the major while course-by-course instructors have picked up more of the introductory courses (including some of the sections for courses required of all business majors).

The number of SCHs provided by CIS faculty has more than doubled over the past five years, as they provide four introductory courses now required of all Business majors; including the CISB 101, 210, 241 and 341. Again, most of this growth in SCH's has been filled by hiring of additional course-by-course instructors. The CIS area has not benefitted from a growth in the number of students majoring in CIS – this has remained relatively constant at about a dozen per year.

Program Strengths

The CIS program benefits from a cohesive dedicated group of Professionals who have a storied legacy at CMU. The program has been forward-looking and understands its strengths and weaknesses, which are well-articulated in the self-study document. Recommendations from the previous review have been taken to heart, and a spirit of continuous improvement is evident. For example, it was a very appropriate and insightful move to develop the curricula for CIS courses that could serve as core requirements for all Business majors.

Of particular note is the manner in which CIS faculty have been instrumental in sponsoring student participation in the AITP club and preparing students for (and accompanying them to) AITP National Collegiate Conference (NCC) competitions and other endeavors, as detailed in the CIS Self-Study document (Tables 3.5-3.8). In addition, faculty

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have been instrumental in some cases in helping graduates find employment, for example by reaching out to previous graduates who may know of employment openings.

There are no glaring deficiencies at present, however there are opportunities for improvement as outlined in this report. Also, because the CIS program is heavily reliant on each of its faculty members for their instructional expertise and other for service contributions, its small faculty size places the program at greater risk, as discussed further below.

Curricula

The CIS program at Colorado Mesa University draws upon a diverse population that includes both graduate and undergraduate students. In addition to CIS specific undergraduate degree and certificate programs, CIS faculty also support students from a variety of academic disciplines. Some of the academic programs that are supported by CIS faculty include a BBA program, BAS Public Administration, BS Computer Science, BS Public Accounting, BS General Accounting, BS Nursing, AS Sport Management, BS Sport Management, AAS Culinary Arts, AAS Baking & Pastry, BS Construction Management, AAS Sustainable Agriculture, AAS Hospitality Management, BA Music Business, and the AA Business Administration. The number of degree and non-degree programs that encourage enrollment in information systems courses is to be commended and should be continued.

As for the CIS specific degree programs, the Business Department has done an excellent job of aligning course titles and descriptions with the model information systems curriculum developed by the Association for Computing Machinery (ACM) and the Association for Information Systems (AIS). The CMU CIS's most recent program review document (2014) includes a mapping of courses to the IS 2002 model curriculum. Given that one of the stated goals of the CIS program is to follow the IS 2010 model curriculum, it would wise to generate an updated mapping of courses to the IS 2010 curriculum. This will help to measure the CIS program's ability to adequately meet assurance of learning objectives.

There is one notable difference between the CMU curriculum and the IS 2010 model curriculum. The IS 2010 model curriculum includes an information systems strategy, management and acquisition course. It is recommended that a similar course be added to the core curriculum for CIS majors at CMU. Graduates from the CIS program should be able to swiftly identify opportunities to leverage technology to help organizations to achieve their strategic objectives. Adding a course in strategic information technology management to the core curriculum at CMU will further increase the marketability of graduates from the CIS program.

Although the IS 2010 model curriculum provides helpful guidelines for developing an IS undergraduate curriculum, the IS 2010 document should not be the only roadmap for curriculum development at CMU. In the foreword to the IS 2010 report, the authors state, "All aspects of the global computing field continue to face rapid and frequent change. As a result, university-level Information Systems curricula need frequent updating to remain effective" (Topi et al., 2010). On average, the ACM and AIS only update their model curriculum every 5-8 years. Given the rapid rate of technology innovation in recent years, it would be wise for CMU to consult a variety of sources for keeping current with industry trends. Ideally, program leaders at CMU will draw upon the expertise of internal faculty, professional associations, external reviewers, program alumni, and an advisory board comprised of local technology executives to validate course topics and technologies.

The past five years have brought an explosion of innovation and job opportunities in a variety of areas including big data, IT security, mobile application development, data center management and cloud infrastructure and services. Developing additional elective offerings in these areas will greatly enhance the knowledge and employability of CIS graduates from CMU. It is also recommended that the CIS program expand student familiarity with enterprise software (e.g., SAP) – plans are reportedly already in place to achieve this.

In 2013, the AACSB released revised business and accounting standards. Under the new standards, the AACSB has recommended that programs expand their focus from information systems foundations to also include coursework in information management, storage and analysis. According to the AACSB, "Data analytics and business analytics along with appropriate IT skills and knowledge development should be a key component of accounting curricula"

(AACSB, 2014). Although CMU does offer a handful of courses in business analysis (e.g. CISB 241and CISB 341) a more focused course on business intelligence and analytics would be preferable. Some of recommended topics for such a course include "data creation, data management and processing, data sharing, data analytics, data mining, data reporting, data security, and storage within and across organizations" (AACSB, 2014).

In addition to data analytics it is strongly recommended that CMU also provide students with an introduction to "Big Data". This will be an important curricular component should AACSB accreditation be pursued at CMU in the coming years. This can be accomplished as a standalone course or as part of two existing courses (CISB 241 and CISB 310). CISB 241 should introduce some of the analytical considerations for big data, and CISB 310 should introduce architectural demands of working in a big-data world.

Although the IS 2010 curricula removed application programming from the core requirements for the CIS undergraduate major, many CIS programs continue to require programming classes. This is likely due in part to the value that employers place on hiring CIS graduates who understand coding principles and can communicate effectively with software development teams. Current program requirements at CMU give students the option of choosing between Business DB App Programming (CISB 206), Beginning Programming (CSCI 110) or Foundations of Computer Science (CSCI 111). One of the areas of recommended improvement concerns the differentiation of these three options for CIS students. The catalog description for the CISB 206 course is too limited. Excellent learning objectives have been developed and incorporated into the prior program review document. Some of these learning objectives should be included in the course description. It is also noted that CSCI 110 and CSCI 111 have not yet been mapped to the stated learning objectives for the CIS major. Although there is a close relationship between information systems and other computing disciplines, there are also significant differences in terms of scope and approach. Advising staff for the CIS major are already likely helping prospective students to navigate contextual differences. Since CSCI 110 and CSCI 111 are possible choices for satisfying core requirements for the CIS major at CMU, it would be helpful to include an analysis of differences between these courses in program review materials.

One of the areas where an industry advisory board could assist the CIS program concerns selecting technologies for incorporation into the computer labs and course materials. Ultimately, incorporating technologies into the classroom that are valued by local employers will enhance the marketability of CIS graduates. CISB 331 (Advanced Business Programming) covers COBOL, Simulation, Java, HTML, CSS, PHP and MySQL. If not already covered, including Python and Visual Basic might also be helpful for students. CISB 451 (Database Administration) should also be expanded to include coverage of both RDBMS and NoSQL database technologies. Graduate and undergraduate course descriptions appear to be very similar (e.g. CISB 460 and CISB 560). Unless classes are being offered concurrently, it would advisable to differentiate more clearly between graduate and undergraduate classes.

Accreditation

The Business Department is reportedly planning to pursue AACSB accreditation within a couple of years. It is recommended that the CIS program postpone pursuit of ABET until a decision has been made about AACSB accreditation. Pursuing two different accreditations will likely require much more energy than the Business Department has the bandwidth to maintain at the present time.

Program Expansion Alternatives

The CIS program graduates roughly a dozen students per year which means that upper-level classes are of small size – this results in a favorable experience for students due to the personal attention but it also results in higher delivery costs per student. Given the growth of the University and with the positive job prospects for CIS graduates, it seems there may be the opportunity to grow the size of the graduating class, to possibly a doubling of its current level (i.e., to 25 per year). This would allow the program to better take advantage of economies of scale in teaching courses and administering the major. At the same time, additional resources will likely be required, as outlined below.

A core, stable, committed group of tenure-track faculty is key to the success of a program such as CIS – and CMU's CIS program is certainly not "bloated" in this regard. Thus as an external reviewer it is tempting to recommend the

hiring of additional tenure-track faculty to facilitate a possible expansion in the number of graduates – an external reviewer has no financial "skin in the game." Certainly, the program could benefit from additional tenure-track (and/or full-time) faculty.

At the same time, when one considers the shifting educational landscape along with demographic trends, it may no longer be appropriate to, as a first line of thought, simply advocate for more tenure track faculty. If CMU's CIS program is to be able to strengthen the educational program that it strives to deliver to a relatively smaller number of students enrolled in the major, it may need to consider other innovative approaches.

Possibly faculty with outside expertise can be hired for relatively short but intensive on-campus experiences. For example, during Fall semester, Molde University in Norway invites Professors from around the world to deliver one-week intensive seminars on a wide range of topics. Students take just one course during that week, and thus gain access to content and instruction that would otherwise be prohibitive for Molde to offer. This approach is very popular with the Molde students. Another example is that of the Indian School of Business in Hyderabad, who similarly contracts with Professors from top US and European Business Schools who deliver electives that would have otherwise been out of reach for the School to offer as it grew to prominence.

Yet another possible avenue for broadening course availability is to leverage the content available through external sources such as on-line courses available from other Universities. Such an on-line course (or even a MOOC) could be taken by CMU students to cover some of the basic materials – of course arrangements would have to be made to gain access to these courses and/or to make the courses available for course credit at CMU. A trade-off with this approach is that CMU may prefer not to dilute their brand by associating with other Universities – on the other hand, if done correctly, an alignment with a high-quality institution might even enhance the CMU brand.

See the Appendix for additional discussion of the changing educational landscape in Business Schools.

Hiring for Expansion and for Replacement

In addition to possible hiring needs for expansion of the number of students in the major, CIS faculty suggested there may be some attrition in the next several years due to retirement. With the small faculty numbers in CIS, any attrition will be felt directly and with significant force. Replacement hires will need to be carefully selected, and with a new hire there is always risk as well as opportunity.

Given the small size of the CIS faculty, the demands on teaching, and the fast-paced changes that occur in content taught by CIS faculty, it becomes paramount that any new hire is a good fit for the position. Thus it is recommended that particular attention be given to any hiring effort.

Appendix: The Changing Educational Landscape

The discussion herein related to innovations in delivery of courses for the CIS degree is framed by the larger evolving environment surrounding higher education. On-line courses and technological enhancements are changing the educational landscape and creating many opportunities for modifying the delivery of traditionally courses. It remains unclear as to the extent and speed with which education will change, however some of these issues are discussed below.

It has always been the case that a person could, in many disciplines, learn technical and scholarly material "on their own" without going to a University campus. In the past this would have meant acquiring textbooks and studying these texts independent of a classroom experience. Today, technology makes this autonomous achievement much easier – Terwiesch and Ulrich (2014) have coined a term for this new technology, calling it "SuperText." Many Universities are using SuperText as the basis for offering on-line courses for credit, and MOOCs (massive open online courses) are available for free from some of the world's most prestigious colleges. The course offered as a MOOC may be the equivalent of (or even a more rigorous version of) the course offered to the full-time students of an elite program delivering the MOOC. Of course, taking the course and learning the material does not give you the formal degree (i.e., the School's "stamp of approval"); however Schools that deliver MOOCs are considering offering a certificate of some kind for successful course completion (some may be doing this already). Effectively, these schools are to some extent unbundling the attributes of the degreed program – someone might choose to enroll at a prestigious school only in part for the content. They may also expect to gain value from rubbing elbows with their cohorts in the program, from participating in travel excursions organized by the School or by classmates, and by interacting with faculty and alumnae. By offering only the course content in the form of a MOOC, a School may not feel as though it is diluting its on-campus student experience because the on-campus experience is so much richer than the course content. See Terwiesch and Ulrich (2014) for a further discussion.

Many instructors who continue to teach in a classroom setting are using various components of SuperText technology (such as Camtasia software) to post videos which students are expected to watch outside of class, and these instructors are then using class time to enrich the learning experience in other ways, either with other activities or to answer student questions. One version of this is called a "flipped classroom" – rather than use class time for a lecture followed by students working problems outside of class, these activities are flipped – students watch the recorded "lecture" outside of class followed by working problems inside class so that student peers along with the instructor can offer feedback in those areas where students are struggling. Some instructors are convinced that there is no longer any reason to deliver a "traditional" class lecture – the lecture can be delivered more competently in recorded fashion, with enhanced learning because students can start and stop and rewind the video as needed. Questions and quizzes can be embedded in the videos to offer students feedback as they go through the material. In some sense (and to a limited degree), each student customizes the lecture to their own needs to enhance the learning process.

In fact, taking the argument one step further, there may be no reason to have instructors at every school delivering a lecture either live or via a recorded video – the SuperText format may spur the evolution of a limited number of "superstar" instructors who have the resources to create great video content, available for use by any instructor anywhere (presumably at a fee, although possibly in an "open" format). Effectively this is simply an extension of what is done today with textbooks – rather than have every instructor develop the textbook content there are a few instructors that write textbooks, which are then used worldwide by instructors who supplement the textbook with lectures and other learning activities. A similar thing may very well develop with video (lecture) content – a few sets of SuperText lectures can be created – let's call this a SuperTextBook – which are then picked up by instructors who supplement the video content with "flipped classrooms," for example. Instructors who use SuperTextBooks might be called "SuperTextFacilators." Presumably, SuperTextFacilitators will be hired at lesser salaries than tenured/tenure-track professors.

While many courses could be delivered electronically via SuperText to an undergraduate (as well as graduate) population, many (if not most) students may still prefer a campus experience in order to gain something beyond the learning of the material delivered via the courses. They may choose the campus experience rather than an on-line program to gain further access to job placement services, for opportunities to participate in clubs and student organizations, and for the social community. It is conceivable that a School could offer an on-campus experience

minus the educational experience, but if students are going to sign up for such an on-campus experience it seems natural that students may want to bundle that experience with an educational degree. Thus this bundled package may likely continue to be quite an attractive product to prospective students. In other words, in spite of SuperTextBooks, it is not obvious that demand for the on-campus undergraduate educational experience will dramatically wane. At the same time, the on-campus undergraduate educational experience may evolve to incorporate SuperTextFacilitators using SuperTextBooks, in response to cost pressures (as well as the desire to deliver a learning experience of highest quality).

In addition to the aforementioned factors, many students may not have the discipline and motivation to complete a course on-line, let alone to complete a full on-line degree (or to acquire knowledge without the achievement culminating in a degree). Joining a campus academic setting allows students to plug into a "support community" which helps keep the student engaged and current with the material. The community also offers more direct feedback as to performance and offers a "sounding board" against which the student can interact to identify their major and minor courses of study. In fact, these may be the strongest argument for the continued viability of Colleges at all levels of selectivity. Undergraduates that are admitted to the most selective Schools may be more motivated and have the support and resources to be able to actually complete an on-line program but may prefer to attend a physical campus in order to take advantage of the other attributes the School has to offer, such as establishing a professional network. Other undergraduates may not have had access to a background that promotes delayed gratification, and may not have developed the rigorous study habits and diligence that are demanded by an autonomous program. These students will still greatly benefit from an on-campus experience. To further illustrate how important it may be for some students to physically participate in an educational community, consider what it takes to rigorously follow an exercise routine – no matter how self-motivated a person may with regard to an exercise regimen, it will likely be advantageous for that person to join a running club or to participate in some kind of a fitness program, for the comradery and accountability that the group helps facilitate. Students may similarly benefit from being physically present in a campus setting.

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