COLORADO MESA UNIVERSITY

Program Review
2015-2021

Computer Information Systems

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1. Introduction and Program Overview

a. Program description by level

The Computer Information Systems (CISB) faculty support students and programs from the certificate level to the baccalaureate and master's level through degree programs, coursework, advising and mentoring, as well as team and individual experiences in the information systems arena. The programs currently supported by the CISB faculty include:

- BS in CISB – central degree in the program
- BAS in CISB – a completer degree for students who possess an AAS upon entering
- BBA in Business Analytics (BA) – a new addition to the CISB program (Fall 2018)
- AA in CISB – an associate degree for students who intend to continue their education
- Minors in CISB and BA – designed for complementing students degree selection
- Minor in Cybersecurity administered jointly with Computer Science
- Certificate in Decision Support Systems – designed for the working professional.

The CISB faculty also support all BBA programs with CISB 210, 241, and 341 along with MBA electives CISB 500, 505, and 560.

b. Brief history of the program

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"
2015 – SAP distribution attempted
2016 – Course in Enterprise Systems, CISB 309, added to update curriculum
2017 – BBA in Business Analytics proposed, begun in Fall 2018, two courses added
CISB 101 removed from BBA core curriculum
MANG/CISB 341 cross-listed became CISB 341 to reflect faculty teaching the course
2018 – CISB faculty assist in pursuit of AACSB accreditation (ongoing)
2019 – Cybersecurity minor added jointly with CS faculty, three classes added in CISB
2021 – Catalog entries cleaned up, CISB curriculum checked for alignment with CC 2020 model by ACM and IEEE-CS professional societies – curriculum is in alignment

c. Recommendations from the previous external review

The previous (2015) external reviewer made numerous comments about the program and can be found in their entirety here on pages 242-249. The activities accomplished in response to these comments are contained in Table 1.1.

Table 1.1
External reviewer comments and responses from 2014

External Reviewer Comments	Responses/Actions Taken
Expand student familiarity with enterprise software, e.g. SAP	SAP distribution attempted
Continue to encourage programming skills in graduates of the CIS major	CISB 206 and CISB 331 are still on the program sheet, with opportunities in CS also
Expand CISB 451 to include coverage of both RDBMS and NoSQL database technologies.	NoSQL component added to CISB 451 along with a lab for install of Mongo, upload of data and analysis of data in Mongo
Provide students with an introduction to "Big Data Analytics"	BBA in BA added along with a course in Big Data – CISB 343
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	Minor in cybersecurity added in conjunction with CS faculty (3 courses are CISB, 3 courses are CSCI)
Staff the CISB 210 course with dynamic instructors (preferably tenured/tenure track or full-time faculty) to ensure that students with the interest and aptitude will be drawn into the CIS major	CISB 210 is staffed with adjunct faculty
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).	Dr. Snyder is the program director, there is no teaching relief available for the position

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.	Brochures and website updated on a periodic basis
Seek accreditation in conjunction with the Business Department's pursuit of AACSB accreditation (or independently via ABET accreditation, within the Computing Accreditation Commission).	CISB is assisting with AACSB accreditation, and will be under the AACSB accreditation umbrella
Continue with (and possibly expand) participation in nationwide competitions.	Students were participating in the AITP's NCC until its cessation. Students have participated in the "new" United States Information Technology College Competition (USITCC). Students have been participating in GoCode Colorado with great success
Consider the costs/benefits of launching an AIS (Assoc. for Info. Sys.) vs. AITP Assoc. of Info. Tech. Professionals) student chapter at CMU.	As AITP is no longer in existence, we are working toward identifying and implementing another student club

d. Mission statement and goals for the program

CMU's Institutional Mission Statement is:

- 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 DSB mission and vision statements are:

- As a student-focused teaching and research department, Colorado Mesa University's Davis School of Business prepares students to be sound decision makers and serves businesses in the Rocky Mountain region, the nation, and the world. We strive to

develop prepared students who demonstrate strong ethical principles, superior critical thinking, effective communication, and robust business acumen.

- While Colorado Mesa University continues to mature into an institution of higher education that successfully prepares students from diverse backgrounds to enter careers of their choice, the Davis School of Business has the following vision:

- To be the premier school of business in Western Colorado, providing excellence in education by focusing on students through engagement, experiential learning, and community involvement.

The CISB 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, nation, and world. CISB faculty focus on student success, quality teaching, and research threads germane to the discipline.

The goals for the CISB program include:

- continuation of the delivery of a quality information systems program adhering to national curriculum standards
- continuation of faculty scholarship germane to the discipline
- continuation of the support of student success (in the classroom as well as extra-curricular activities such as student competitions or the production of scholarship)
- having the ability to adapt and pivot according to curriculum or environmental changes.

e. CISB curriculum support for other programs

The CIS faculty support other programs as follows:
CISB 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 courses can be used as electives in the BBA and the BS in Computer Science.
CISB 211, 221, and 311 comprise half of the cybersecurity minor (the other courses are in CS)
CISB 101 is a required course for some degree programs across campus (computer literacy)

f. Locational/comparative advantage

The Grand Valley is quickly becoming the hub of information systems activity on the Western Slope of Colorado. Companies such as Kaart Mapping Group, Networks Unlimited, and many other IT support companies routinely hire CMU's CISB graduates. Additionally, due to Covid, many remote workers have been relocating to the Grand Valley from areas such as California and Texas.
The CISB program, 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 and information technology needs.

g. Other information

CMU's CISB curriculum follows nationally normed curriculum models (IS 2002, IS 2010, and most recently, Computing Curricula 2020 (CC 2020) – available in the program review folder). CMU's CISB students do exceptionally well on one of the program's assessment metrics, the ICCP's ISA exam, data on which is presented later in this report. The survey of graduates of the CISB program (done by CMU's Institutional Research Department) indicate satisfaction with how the program prepares them for the business world and indicates that an overwhelming majority of those surveyed are working in the information systems field.

2. Curriculum

a. Breadth, depth, and level of the discipline

The CISB program aligns its curriculum with nationally accepted curriculum models. In the past, CISB has used the IS 2002 and IS 2010 models which have recently been upgraded to the CC 2020 model published by the ACM and IEEE-CS professional societies. By following these national curriculum models, the CMU CISB students have the same competitive skills as graduates from other universities for the national job market. The course recommendations in the CC 2020 were compared to the current CISB courses as illustrated in Table 2.1.

Table 2.1: CC 2020 Curriculum and CMU's course offerings

Skill Set/Knowledge Area in the 2020 curriculum model	**CISB course where addressed (or alternative)**
Information Systems Foundations	210
Data and Information Management	451, 471
Data and Business Analytics Data/Info Visualization	241, 341
IT Infrastructure	315
Secure Computing	210, embedded in coursework, Cybersecurity Minor (211, 221, 311)
Emerging Technologies	embedded in Jr/Sr level coursework
Systems Analysis and Design	442
Application Development and Programming	206, 331, (442, 451, 471) or CSCI 110, 111
Object Orientation	206, 331
Web Development	471, CSCI 106 if selected as an elective
Mobile Development	471, CSCI 405 if selected as an elective
User Interface Design	471, CSCI 337 if selected as an elective
IS Ethics, Sustainability, Use and Implications for Society	210, 470
IS Management and Strategy	210, 315, 470

Digital Innovation	210, 470
Business Process Management	471, MANG 201
Project Management	410
IS Practicum	471

b. Program currency and curricular changes

The CISB program was recently compared to the CC 2020 curriculum model to assure its currency. The results of this comparison are given in Table 2.1. Other curricular changes in the past six years are:

- replace CISB 400 (Data Communications and Network Management) with CISB 315 (IT Infrastructure)
- update CISB 341 to include more data analytics, visualizations, and an ethics exercise
- replace CISB 392 (Information System Theory and Practice) with CISB 470 (Management of Information Systems)
- incorporate NoSQL discussions and hands-on lab into CISB 451 (Database Administration)
- BBA concentration and minor in Business Analytics added
- minor in cybersecurity added (joint program with computer science)

c. Description of program delivery and formats and changes in delivery

The primary delivery format is face-to-face, based on student preference. Many of the 300-400 level CISB courses are offered on TR to facilitate student work schedules. The service courses, CISB 101, 210, 241, and 341 are also available in an online format, along with CISB 460 and 470, depending on the instructor and the semester. All MBA classes have moved to an online format, so CISB 500, 505, and 560 are online when offered.

CMU also offers CISB 101face-to-face at the Montrose campus.

3. Analysis of Student Demand and Successes

a. Number of majors

Table 3.1: Number of majors by concentration and year

Major/Concentration	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Pre-CISB			9	12	15	15
Provisional Baccalaureate CISB	1	1	1	3	4	0
BS in CISB	34	48	54	49	44	48
BAS in CISB	7	5	7	4	2	4

BBA in MI (phased out beginning 2017)	5	9	4	3	0	0
BBA in IS (phased out beginning 2017)	4	11	17	4	4	2
BBA in BA (begun in 2018)				4	15	21
AA in CISB	18	12	12	13	8	8
Minor in CISB	5	9	10	13	11	11
Minor in MI	3	1	2	4	3	0
Minor in BA					8	9
Minor in Cybersecurity						4
Prof Cert in Decision support	7	3	0	6	2	0
Totals	84	99	116	115	116	122

Table 3.1 illustrates that the CISB program is exhibiting steady growth in the number of students selecting CISB as a major, minor, associate, or certificate option.

b. Student credit hours by student level

Table 3.2: Number of student credit hours by student level

Student Level	2015-16 SCH	2016-17 SCH	2017-18 SCH	2018-19 SCH	2019-20 SCH	2020-21 SCH
FR	741	660	**441**	**132**	159	135
SO	1275	1068	1072	834	735	762
JR	897	753	900	921	759	987
SR	985	842	**901**	**1430**	1497	1567
GRAD	24	18	21	15	6	21
ND	6	3	9		6	6
Total	3928	3344	3344	3332	3162	3478

c. Student credit hours subtotal by course level

Table 3.3: Number of student credit hours by course level

Course Level	2015-16 SCH	2016-17 SCH	2017-18 SCH	2018-19 SCH	2019-20 SCH	2020-21 SCH
100	1767	1464	**1416**	**828**	624	609
200	1659	1422	1464	1410	1413	1746
300	235	182	**173**	**737**	816	834
400	237	252	267	321	291	253
500+	30	24	24	36	18	36
Totals	3928	3344	3344	3332	3162	3478

Tables 3.2 and 3.3 show the impact of removing CISB 101 from the BBA core. This is the drop of SCH production by 100 level courses, taken by freshmen, exhibited between 2017-18 and 2018-19. During the same period the cross-listed courses MANG 341/CISB 341 became CISB 341 to reflect where the faculty teaching CISB 341 were housed in the Davis School of Business. This change resulted in the increase of SCH production for the 300-level coursework, taken by upper-division (JR and SR) students. All other levels remained relatively constant.

d. Number of graduates by concentration

Table 3.4: Number of graduates by concentration and year

Major/Concentration	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
BS in CISB	7	9	9	13	10	9
BAS in CISB		1		2	1	0
BBA in MI (phased out beginning 2017)	2	3	3	1	1	0
BBA in IS (phased out beginning 2017)	1		6		2	2
BBA in BA (Begun in 2018)					1	4
AA in CISB		1	1	3	0	0
Minor in CISB	1	2	2	3	2	5
Minor in MI	4	2		1	4	0
Minor in BA					1	3
Minor in Cybersecurity						1
Prof Cert in Decision support	5	2		6	1	0
Totals	20	20	21	29	23	24

CISB graduate numbers have been relatively constant over the past six years.

e. Student successes/recognitions

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, participating in the USITCC competitions, finalist selections in the Colorado Secretary of State's GoCode Colorado Competition, and participating in CMU's Student Showcase, where semester or yearlong projects are exhibited in an open forum for the community. Table 3.5 lists the student successes.

Table 3.5: Student success and recognition

Student/Student Group	Event	Outcome
Zach Horrall	AITP NCC	First Place, Microsoft Office Solutions Second Place, Business Analysis
Jordan Fisher	AITP NCC	Second Place, PC Troubleshooting
Mark Boomgaard	AITP NCC	First Place, Microsoft Office Solutions Second Place, Business Analysis
Colorado Restaurant Assistant (student/faculty team)	GoCode Colorado, 2019	Statewide Finalists
Maverick Housing Analysis (student team)	GoCode Colorado, 2021	Statewide Finalists
Unmasking the Data (student team)	GoCode Colorado, 2021	Statewide Finalists
Mavucation (student team)	GoCode Colorado, 2021	Statewide Finalists 3rd Place, Analytics Track, $5,000 prize
WhoCares (student team)	GoCode Colorado, 2021	Statewide Finalists 2nd Place, Analytics Track, $10,000 prize People's Choice Award
CISB 471 Teams	Student Showcase	Present semester project every year

4. Program Resources

a. Faculty

1) Table 4.1 shows the ratios of full-time equivalent students (FTES) to full-time equivalent faculty (FTEF). The ratio has been steady over the self-evaluation period, closely aligning with the departmental averages.

Table 4.1: Ratio Information for FTES to FTEF

Year	FTES	FTEF	FTES:FTEF
2015-16	130.9	7.4	17.8
2016-17	111.5	6.1	18.3
2017-18	111.5	5.7	19.7
2018-19	111.1	6.2	17.9
2019-20	105.4	5.8	18.1
2020-21	115.9	6.7	17.4

2) The course credit hours (CCH) and student credit hours (SCH) taught by the four faculty types are listed in Table 4.2.

Table 4.2: Course Credit Hours/Student Credit Hours by Faculty Type, CCH/SCH

Year	T/TT	FT non-T/TT	PT	Admin/Coach
2015-16	75/1408	0/0	90/2205	12/315
2016-17	50/890	6/132	81/2088	9/234
2017-18	22/455	36/867	69/1797	9/225
2018-19	68/1322	24/624	51/1245	6/141
2019-20	71/1419	9/264	54/1341	6/138
2020-21	70/1213	15/363	60/1566	15/336

3 & 4) Faculty successes/quality/recognition are listed in the curriculum vitas in Appendix A.

b. Financial Information

The budget for CISB and Accounting are grouped together under one account number. This is an artifact of the previous configuration of the department (pre-2004) when CISB and Accounting were one department. Currently, the CISB program has one full time faculty member, while Accounting has six. In the past, CISB has had more full-time faculty members, and is presently trying to hire a T/TT line in CISB. Regarding the budget, CISB accounts for approximately 25% of the expenses while Accounting accounts for approximately 75%. The budget data are given in Table 4.3.

Table 4.3: CISB and Accounting budget (Totals assume a 25%/75% share distribution between CISB/Accounting)

Account	Account Title	FY15/PD14 Adjusted Budget	FY15/PD14 Year to Date	FY16/PD14 Adjusted Budget	FY16/PD14 Year to Date	FY17/PD14 Adjusted Budget	FY17/PD14 Year to Date	FY18/PD14 Adjusted Budget	FY18/PD 14 Year to Date	FY19/PD14 Adjusted Budget	FY19/PD 14 Year to Date	FY20/PD14 Adjusted Budget	FY20/PD 14 Year to Date
5086	STATE CLASSIFIED OVERTIME WAGES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5146	STATE CLASSIFIED MEDICARE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5166	STATE CLASSIFIED PERA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5168	STATE CLASSIFIED PERA AED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5169	STATE CLASSIFIED PERA SAED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5226	STATE CLASSIFIED LIFE INS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07
5255	FACULTY REGULAR FT WAGES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	514,124.53	713,995.00	591,688.85	731,130.00	593,920.44
5256	ADMIN REGULAR FT WAGES	789,552.00	730,971.11	811,458.00	679,430.52	695,829.00	631,802.52	737,139.00	11,414.84	12,240.00	12,611.31	12,534.00	11,054.30
5258	DEPT HEAD STIPENDS	0.00	0.00	0.00	0.00	0.00	0.00	4,763.00	1,542.00	4,008.00	1,588.23	4,008.00	2,968.03
5285	FACULTY TEMP FT WAGES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47,739.50	47,858.00	98,510.33	49,007.00	49,006.98
5295	FACULTY TEMP PT WAGES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79,841.16	62,000.00	59,975.36	60,000.00	63,648.00
5366	FACULTY OVERLOAD	0.00	6,348.00	0.00	7,266.00	0.00	2,250.00	0.00	9,187.50	0.00	3,199.98	0.00	16,400.00
5376	ADMIN OVERTIME WAGES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5386	FACULTY/ADMIN ANNUAL LEAVE	0.00	1,450.37	0.00	1,855.56	0.00	1,678.36	0.00	4,885.62	0.00	564.92	0.00	1,166.07

5396	FACULTY/ADMIN SICK LEAVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	934.49	0.00	164.77	0.00	313.33
5416	FACULTY/ADMIN DCPP - TIAA	0.00	54,211.92	0.00	56,070.75	0.00	52,577.49	0.00	32,526.06	0.00	37,261.47	0.00	57,805.25
5446	FACULTY/ADMIN MEDICARE	0.00	11,315.72	0.00	11,178.82	0.00	11,957.61	0.00	9,111.41	0.00	9,065.75	0.00	9,989.28
5456	FACULTY/ADMIN OTHER RETIREMENT PLAN	73,057.00	0.00	75,093.00	0.00	61,061.00	0.00	62,282.00	0.00	41,355.00	0.00	51,920.00	0.00
5466	FACULTY/ADMIN PERA	38,298.00	14,908.39	40,953.00	17,943.98	56,414.00	17,906.78	60,951.00	24,493.49	95,780.00	20,618.80	81,852.00	19,920.94
5468	FACULTY/ADMIN PERA AED	0.00	5,951.00	0.00	7,775.68	0.00	8,480.59	0.00	12,065.67	0.00	10,148.00	0.00	9,577.48
5469	FACULTY/ADMIN PERA SAED	0.00	5,589.39	0.00	7,509.56	0.00	8,395.40	0.00	12,065.67	0.00	10,148.00	0.00	9,577.48
5506	FACULTY/ADMIN DENTAL INSURANCE	0.00	4,392.96	0.00	3,994.48	0.00	5,894.00	0.00	4,121.85	0.00	4,604.97	0.00	5,018.86
5516	FACULTY/ADMIN HEALTH INSURANCE	145,468.00	72,082.56	111,972.00	63,391.52	126,196.00	71,599.04	115,960.00	79,028.37	149,850.00	91,187.96	153,645.00	93,181.04
5526	FACULTY/ADMIN LIFE INSURANCE	0.00	2,316.80	0.00	2,147.13	0.00	2,349.98	0.00	1,765.07	0.00	1,861.43	0.00	1,965.83
5536	FACULTY/ADMIN DISABILITY	0.00	1,565.20	0.00	1,451.32	0.00	1,373.75	0.00	948.27	0.00	1,001.28	0.00	1,055.89
5706	STUDENT ASSISTANTS	4,500.00	0.00	2,000.00	0.00	2,000.00	243.00	2,000.00	0.00	2,000.00	1,418.75	2,200.00	2,003.36
5816	STUDENT MEDICARE CONTRIBUTION	0.00	0.00	0.00	0.00	0.00	2.13	0.00	0.00	0.00	0.00	0.00	2.33
6100	PROFESSIONAL FEES EXTERNAL	0.00	100.00	0.00	200.00	0.00	396.85	0.00	130.00	0.00	3,073.88	0.00	69.00
6150	EMPLOYEE TRAVEL - IN STATE	5,400.00	579.12	6,000.00	796.40	6,000.00	380.64	6,000.00	0.00	6,000.00	487.99	6,000.00	914.88
6170	EMPLOYEE TRAVEL -	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	INTERNATIONAL												
6201	SUPPLIES	10,400.00	2,574.81	10,400.00	7,479.71	10,400.00	2,716.58	10,138.44	4,177.41	10,400.00	4,631.64	10,400.00	1,725.25
6215	SOFTWARE - ACADEMIC	0.00	990.00	0.00	619.99	0.00	29.12	0.00	33.10	0.00	0.00	1,119.00	1,119.00
6230	PRINTING OFF-CAMPUS	0.00	18.63	0.00	243.85	0.00	294.58	0.00	43.70	0.00	28.90	0.00	0.00
6310	SUBSCRIPTIONS & BOOKS	0.00	279.61	0.00	274.22	0.00	993.20	0.00	56.78	0.00	351.73	790.00	789.39
6360	PERSONNEL RECRUITING - OUT OF STATE	0.00	171.36	0.00	220.98	880.00	0.00	0.00	1,353.96	0.00	0.00	0.00	462.80
6401	TELEPHONE CALLS	10.00	14.47	10.00	19.11	10.00	12.49	10.00	8.97	10.00	7.16	10.00	28.35
6410	TELEPHONE EQUIPMENT	3,368.00	3,168.00	3,368.00	3,168.00	3,368.00	3,168.00	3,368.00	2,970.00	3,368.00	2,772.00	2,772.00	2,772.00
6430	POSTAGE	0.00	23.23	0.00	0.00	0.00	12.08	0.00	0.00	0.00	42.05	0.00	0.00
6470	DUES & MEMBERSHIPS	0.00	1,185.45	0.00	1,303.00	0.00	944.95	0.00	470.00	0.00	970.00	2,251.00	4,588.00
6761	RENT/LEASE EQUIPMENT - COPIER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,000.00	2,749.12	4,000.00	2,469.08
6840	OFFICIAL FUNCTION MEETINGS SEMINARS	0.00	0.00	0.00	0.00	0.00	34.20	0.00	169.18	0.00	49.92	0.00	1,119.61
6850	OFFICIAL FUNCTIONS	200.00	48.60	1,540.00	141.95	200.00	506.92	200.00	61.25	200.00	641.58	200.00	330.90
7150	PROFESSIONAL DEVELOPMENT	0.00	1,024.00	0.00	915.00	0.00	605.00	0.00	159.00	0.00	405.00	0.00	1,763.00
8860	ROLLFORWARD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96,085.36	0.00
5296	ADMIN TEMP PT WAGES	60,000.00	73,893.34	60,000.00	109,969.35	55,000.00	127,146.04	46,920.00	0.00	0.00	9,655.81	0.00	3,483.33
5426	FACULTY/ADMIN DCPP - FIDELITY	0.00	16,178.56	0.00	10,221.99	64,763.00	98,158.28	60,000.00	0.00	0.00	843.37	0.00	153.60
6120	FOOD SERVICE	0.00	1.73	0.00	1,800.00	0.00	19,867.50	0.00	11,134.65	0.00	2,382.32	0.00	45.50

6160	EMPLOYEE TRAVEL - OUT OF STATE	0.00	2,880.03	0.00	690.00	0.00	135.60	0.00	888.39	0.00	234.00	0.00	327.58
6211	SOFTWARE	0.00	983.54	0.00	28.21	0.00	722.78	0.00	80.00	0.00	181.34	0.00	904.00
6760	RENT/LEASE EQUIPMENT	4,000.00	2,045.10	4,000.00	2,068.34	0.00	291.16	0.00	2,660.14	0.00	106.89	0.00	4,533.36
6830	OFFICIAL FUNCTIONS STUDENT RELATED	0.00	72.90	0.00	302.19	4,000.00	3,234.63	4,000.00	0.00	0.00	610.00	1,468.89	928.00
8885	BUDGETED CHANGE TO FUND BALANCE	63,131.00	0.00	74,848.00	0.00	81,603.00	0.00	91,772.00	0.00	96,455.00	0.00		
	Totals:	**1,197,384.00**	**1,017,335.90**	**1,201,642.00**	**1,000,477.61**	**1,167,724.00**	**1,076,161.25**	**1,205,503.44**	**870,192.03**	**1,249,519.00**	**985,844.86**	**1,271,392.25**	**977,102.59**

	CISB Portion:	**299,346.00**	**254,333.98**	**300,410.50**	**250,119.40**	**291,931.00**	**269,040.31**	**301,375.86**	**217,548.01**	**312,379.75**	**246,461.22**	**317,848.06**	**244,275.65**

c. Library Assessment

Library Program Assessment
John U. Tomlinson Library
Colorado Mesa University

Date of Assessment: November 6, 2021

Program under review: Program Review

Description of Program: Computer Information Systems

Program Level/s: Bachelor of Science

Liaison: Laureen P. Cantwell

1. Collection Assessment

The assessment covers five areas: Reference sources, Monographs, Electronic resources, Periodicals and Media. The assessment methodology, supporting data and resource lists are included in the Appendices.

Appendix A: Reference Sources	p. 3	Appendix D: Periodicals	p. 6-8
Appendix B: Monographs	p. 3-5	Appendix E: Media	p.8-9
Appendix C: Electronic Resources	p. 5-6	Appendix F: Additional Resources	p. 9

2. Evaluation of the total collection

a. Strengths: The Library's reference collection for CIS content is likely slim for good reason (as the field changes so quickly), but the collection could benefit from investment in more recently-published content. With regard to monographic content, acquisitions efforts have focused on e-book content (e.g., through databases like SpringerLink, though print monographs are still purchased as well. Finally, regarding electronic resources and periodical content, we are quite strong here, due in particular to our Business-related subscriptions and Computer Science-related holdings in Business Source Complete, Science Direct, SpringerLink, and other databases.

b. Weaknesses: As may be evident from the individual sections of the assessment, the Library collection may benefit from current reference additions in the very current/recent topics of the field. That said, we do not have many weaknesses in this collection due to investments in scholarly and e-book databases.

3. Recommendations

The Library should continue to acquire resources for Computer Information Systems based on current topics of relevance to the field and curricular interests and developments. Ongoing conversation with program faculty will prove beneficial in continued understanding of the field, our program, and its Library support needs.

Library Director:
Sylvia Real
Date: November 10, 2021

APPENDIX A: Reference sources (green = ebook)

- Springer, P. J. (2017). Encyclopedia of cyber warfare. ABC-CLIO, an Imprint of ABC-CLIO, LLC.
- Alhajj, R., & Rokne, J. (2014). Encyclopedia of social network analysis and mining. Springer.
- Peterson's. (2013). Peterson's graduate programs in biological/biomedical sciences & health-related medical professions. Peterson's Pub.
- Peterson's. (2013). Peterson's graduate programs in business, education, information studies, law & social work. Peterson's Pub.
- Friedman, J. P., & Barnhill, S. S. (2012). Dictionary of business and economics terms. 5th ed. Barron's Educational Series, Inc.
- Floridi, L. (2010). The Cambridge handbook of information and computer ethics. Cambridge University Press.
- Himma, K. E., & Tavani, H. T. (2008). The handbook of information and computer ethics. Wiley.
- Schultz, D. A, & Vile, J. R. (2005). The encyclopedia of civil liberties in America. Sharpe Reference.

APPENDIX B: Monographs

A. Method of analysis: The following table displays a view of representative results found when searching the Tomlinson Library catalog for relevant CISB content. It displays the number of titles since 2010 (for print items) and the number of items found for print and/or electronic items.

Age/Format Analysis:

Search tactic: Print Books
e-Books
(since 2010)

“computer information systems” OR “business information technology” OR "business information systems" OR "business systems" OR "business analyst" OR "business systems analyst" OR "information system analysis" OR "database administration" OR "network administration" OR "information systems management" OR "systems administration” (keyword search) 31
(11 since 2010) 1,091
(many conference papers and proceedings)

- Nocentino, A. E., & Weissman, B. (2022). SQL server on Kubernetes: Designing and building a modern data platform. Apress.
- Al-Emran, M., & Shaalan, K. (2021). Recent advances in technology acceptance models and theories. Springer.
- Alareeni, B., Hamdan, A., & Elgedawy, I. (2021). The importance of new technologies and entrepreneurship in business development: In the context of economic diversity in developing countries: The impact of new technologies and entrepreneurship on business development. Springer.
- Hassan, N. R., & Willcocks, L (2021). Advancing information systems theories: Rationale and processes. Palgrave Macmillan.
- Hovestadt, C., Recker, J., Richter, J., & Werder, K. (2021). Digital responses to COVID-19: Digital innovation, transformation, and entrepreneurship during pandemic outbreaks. Springer.
- Kryvinska, N., & Poniszewska-Marańda, A. (2021). Developments in information & knowledge management for business applications. Springer.
- Kumar Pani, S., & Pandey, M. (2021). Internet of Things: Enabling technologies, security, and social implications. Springer.
- Seaman, J. (2021). Protective security: Creating military-grade defenses for your digital business. Apress.
- Skyrius, R. (2021). Business intelligence: A comprehensive approach to information needs, technologies, and culture. Springer.
- Zaramenskikh, E., & Fedorova, A. (2021). Digital transformation and new challenges: Changes in business and society in the digital era. Springer.
- Davenport, T. H., & Harris, J. G. (2017). Competing on analytics: The new science of winning (Updated). Harvard Business Review Press.
- Ruparelia, N. (2016). Cloud computing. The MIT Press.
- Siegel, E. (2016). Predictive analytics: The power to predict who will click, buy, lie, or die (Revised and updated edition.). John Wiley & Sons, Inc.
- Carlson, J., & Johnston, L. (2015). Data information literacy: Librarians, data, and the education of a new generation of researchers. West Lafayette, Indiana: Purdue University Press.
- Keenan, S. C. (2015). Financial institution advantage & the optimization of information processing. John Wiley & Sons, Inc.
- Mitchell, J. M. (2015). Staying the course as a CIO: How to overcome the trials and challenges of IT leadership. John Wiley and Sons, Inc.

- Ohlin, J. D., Govern, K., & Finkelstein, C. O. (2015). Cyber war: Law and ethics for virtual conflicts (1st edition.). Oxford University Press.
- Qudrat-Ullah, H. (2015). Better decision making in complex, dynamic tasks: Training with human-facilitated interactive learning environments. Springer.
- Upasta, V. (2015). Managing your outsourced IT services provider: How to unleash the full potential of your global workforce. Apress.
- Winters-Miner, L. A. (2015). Practical predictive analytics and decisioning systems for medicine: Informatics accuracy and cost-effectiveness for healthcare administration and delivery including medical research. Academic Press.
- Glass, R., Callahan, S. (2014). The big data-driven business: How to use big data to win customers, beat competitors, and boost profits. Wiley.
- Rhoads, C. (2014). The entrepreneur's guide to running a business: Strategy and leadership. Praeger.
- Roberts, D. D. (2014). Unleashing the power of IT: Bringing people, business, and technology together. Second edition. Wiley.
- Davenport, T. H. (2013). Enterprise analytics: Optimize performance, process, and decisions through big data. FT Press.
- Elleithy, K., & Sobh, T. (2013). Innovations and advances in computer, information, systems sciences, and engineering. Springer.
- Erl, T., Puttini, R., & Mahmood, Z. (2013). Cloud computing: Concepts, technology, & architecture. Prentice Hall.
- Bovée, C. L., & Thill, J. V. (2012). Business communication essentials. 5th ed. Pearson Prentice Hall.
- Carr, J. (2012). Inside cyber warfare (2nd ed.). O'Reilly.
- Hwang, K., Fox, G. C., & Dongarra, J. J. (2012). Distributed and cloud computing: From parallel processing to the Internet of things. Morgan Kaufmann.
- Linington, P. F. (2012). Building enterprise systems with ODP: An introduction to Open Distributed Processing. CRC Press.
- Oatway, J. (2012). Mastering story, community, and influence: how to use social media to become a socialeader. Wiley.
- Passerini, K., El Tarabishy, A., & Patten, K. (Online Service). (2012). Information technology for small business: Managing the digital enterprise. Springer.
- Kroenke, D. M. (2011). Using MIS. (3rd ed.) Prentice Hall.
- Lawson, J., Kroll, J., & Kowatch, K. (2010). The new information professional: Your guide to careers in the digital age. Neal-Schuman Publishers.
- Tapscott, D., & Williams, A. D. (2010). MacroWikinomics: Rebooting business and the world. Portfolio Penguin.

APPENDIX C: Electronic Resources

Indexes/Databases and Journal Articles

Business Source Complete [searched: “computer information systems” OR “business information technology” OR "business information systems" OR "business systems" OR "business analyst" OR "business systems analyst" OR "information system analysis" OR "database administration" OR "network administration" OR "information systems management" OR "systems administration”] – over 106,000 search results, nearly 35,000 of which were published since 2010 and are available full-text. Publications returning a significant number of full-text available results include: Modern Healthcare; CIO; Health Management Technology; Information Systems Management; International Journal of Information Management; MIS Quarterly; Computer Weekly; Information Management Journal; Journal of Management Information Systems; Information Systems Journal; Information Sciences; CIO Insight; Information Today; KM World; the Journal of Journal of Information Systems Education; Behavior & Information Technology; and Decision Support Systems.

ScienceDirect [searched: “computer information systems” OR “business information technology” OR "business information systems" OR "database administration" OR "network administration" OR "information systems management" OR "systems administration”] – nearly 13,000 search results returned, over 8,000 of which are research articles or are open access; review articles, encyclopedia entries, and book chapters make up another 2,000 results. Publications returning a significant number of full-text available results include: Information & Management; Procedia Computer Science; Computers & Security; Decision Support Systems; International Journal of Information Management; Journal of Systems and Software; Information and Software Technology; Expert Systems with Applications; Procedia Social and Behavioral Sciences; Future Generation Computer Systems; the Journal of Strategic Information Systems, and Computers in Human Behavior.

SpringerLink [searched: “computer information systems” OR “business information technology” OR "business information systems" OR "business systems" OR "business analyst" OR "business systems analyst" OR "information system analysis" OR "database administration" OR "network administration" OR "information systems management" OR "systems administration”] – over 980,000 search results, over 900,000 of which are articles or book chapters. Nearly 35,000 of these fall into the “Business & Management” subject area, with popular subdisciplines of information systems applications, artificial intelligence, computer communication networks, and more (the Computer Science discipline returns over 500,000 results). Publications returning a significant number of full-text available results include: Encyclopedia of Wireless Networks; Communication and Smart Technologies; Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship; Data Governance and Data Management; Digital Entrepreneurship; Palgrave Handbook of Corporate Social Responsibility; Responsible Design, Implementation and Use of Information and Communication Technology; and Knowledge Management in Organizations. It’s worth noting that their eBooks can be printed on demand (usually for about $30-$50 dollars, often far less than the expense of textbooks), or downloaded for free, as PDFs, in their entirety or as individual chapters. It may be worth exploring SpringerLink for potential assigned readings and texts, but also worth student exploration for content of use to research projects and more.

Wiley Online Library [searched: “computer information systems” OR “business information technology” OR "business information systems" OR "business systems" OR "business analyst" OR "business systems analyst" OR "information system analysis" OR "database administration" OR "network administration" OR "information systems management" OR "systems administration”] – over 5,600 results published between 2010 and 2021 (and more than 3,800 are from journals). Journal titles from these full-text available results include the Journal of Consumer Psychology; Electronic Journal of Information Systems in Developing Countries; Information Systems Journal; Health Services Research; Business Ethics, the Environment & Responsibility; Systems Research and Behavioral Science; Journal of Industrial Ecology; International Journal of Communication Systems; Information Systems Journal; and Expert Systems.

Search results from these databases indicate abundant material available in periodical resources, much with immediate full-text. Journal literature not available in full-text through Colorado Mesa University can be obtained by the Interlibrary Loan Department. Article requests submitted through Interlibrary Loan are usually filled within 24 hours; the average turn-around time is 12 hours.

APPENDIX D: Periodicals

A search of the CMU Tomlinson Library collection of print and electronic periodical subscriptions highlights a number of very relevant titles. We show journals and other periodicals for the subjects “Business – Data Processing,” “Computers,” and more. A selection of useful titles for Computer Information Systems to which we subscribe include:

- Academy of Business Journal (Business Source Complete, 2011-present)
- ACM Transactions on Programming Languages and Systems (Business Source Complete, 2009-current; some print holdings)
- ACM Transactions on Database Systems (Business Source Complete, 1996-current)
- ACM Transactions on Computer Systems (Business Source Complete, 2009-current)
- Advances in Business-Related Scientific Research Journal (Business Source Complete, 2013-present)
- Advances in Human-Computer Interaction (EBSCO Open Access Computer Science Collection, 2008-present)
- Annals of Operations Research (Business Source Complete, 1984-current, 12-month embargo)
- Applied Computational Intelligence and Soft Computing (EBSCO Open Access collections, 2009-current)
- BMC Bioinformatics (Academic Search Complete, EBSCO Open Access collections: 2000-current)
- CD Computing News (NexisUni: 1996-current)
- Communications of the ACM (Business Source Complete, 1999-current; Print @ CMU, 1974-present)

- Computer Protocols (Business Source Complete & LexisNexis, 1996-current)
- Computer Science and Information Systems (EBSCO Open Access Computer Science Collection, 2004-current)
- Computer Weekly (Business Source Complete, 2002-current)
- Database Trends and Applications (OMNI File Full Text Select, 2009-current)
- Educational Technology, Research and Development (Academic Search Complete, 2004-current, 1-year embargo; Education Full Text, 1999-present, 1-year embargo)
- Electronic Commerce Research (Business Source Complete, 2004-current, 1-year embargo)
- Health Management Technology (EBSCO Open Access Computer Science Collection, 2010-current; Nexis Uni, 1998-present)
- Information Processing & Management (ScienceDirect, 1975-current)
- Information Society (Business Source Complete, 1997-current, 18-month embargo)
- Information Systems Management (Business Source Complete, 1991-current, 18-month embargo)
- Information Systems Research (Business Source Complete, 1990-current, 5-year embargo)
- Information Today (Business Source Complete, 1996-current; LISTA Abstracts with Full Text, 1983-current)
- Journal of Computer and System Sciences (ScienceDirect, 1967-current)
- Journal of Computer Science & Technology (EBSCO Open Access collections, 1999-current)
- Journal of Information Security and Applications (ScienceDirect, 2014-current)
- Journal of International Technology and Information Management (Business Source Complete, 2010-current; EBSCO Open Access Technology Collection, 2004-current)
- Journal of Management Information Systems (Business Source Complete, 1984-present)
- Journal of Strategic Information Systems (ScienceDirect, 1991-current)
- Journal of the Association for Information Systems (Business Source Complete, 2003-current, 1-year embargo)
- Journal of the ACM (Business Source Complete, 2004-current; some print holdings)
- MacWorld (Nexis Unit, 2017-current; Business Source Complete, digital edition, 2015-present)
- MIS Quarterly (Business Source Complete, 1977-current, 6-year embargo)
- MIS Quarterly Executive (Business Source Complete, 2006-current, 1-year embargo)
- Simulation & Gaming: An International Journal of Theory, Design, & Research (Sage Journals, 1999-current)
- Software and Systems Modeling (Academic Search Complete, 2003-current, 1year embargo)
- Streaming Media Magazine (Business Source Complete, 2007-current)
- Theory of Computing Systems (Business Source Complete, 1997-current, 1-year embargo)
- Wired (Science Reference Center, 2008-current; some print holdings)

APPENDIX E: Media

The Library subscribes to Films on Demand – a streaming video service from Films Media Group. This service includes educational videos, documentaries, and PBS productions. The library also purchases DVDs to support the curriculum. Some Films on Demand titles that might be appropriate for this program are:

- Data mining: Big data's increasing challenge and payoff (25 min.)
- IT networks (20 min.)
- ICT in organizations (21 min.)
- IT in business (21 min.)
- The future of the internet (30 min.)
- Computers at work (27 min.)
- Apple and Google compete to build and maintain more perfect digital mapping system (9 min.)
- Cracking the code (43 min.)
- Preserve net neutrality: All data is created equal: A debate (90 min.)
- Automation will crash democracy: A debate (95 min.)
- Silicon Valley has lost its soul: A debate (65 min.)
- Coding life (47 min.)
- Beyond Innovation Series (24 min. episodes) -- "Beyond Innovation" uncovers the world's new and emerging technologies changing the way we live and do business. Venture capitalist and entrepreneur Anthony Lacavera travels the globe in search of investors and founders who are taking risks and betting big on our future. Journalist Michael Bancroft unearths the latest advancements in technology across industries, including artificial intelligence and gene editing, and discovers innovators creating the probable from the once-impossible.

APPENDIX F: Additional Resources

Journal literature not available through Colorado Mesa University, including those titles not available because of publisher embargo, can be provided by the Interlibrary Loan Department. Article requests are provided through 2 programs, RapidILL and OCLC Resource Sharing. RapidILL gives access to journal collections in many academic libraries of all sizes. The average amount of time it takes to fill an article request is 12 hours. Most requests are filled through this program. Beyond that, OCLC Resource Sharing gives access to library collections world-wide. Both of these programs also provide book chapters as scanned documents.

Books and government documents owned by the library but housed in storage may be requested from storage and will be available within a day. Items not owned by Colorado Mesa University can be borrowed from other libraries through Prospector – Colorado libraries plus University of Wyoming, MOBIUS – Missouri libraries plus Tulsa City & County, or OCLC Resource Sharing – libraries worldwide. Books from Prospector and MOBIUS arrive in about 3 and 5 working days respectively via the statewide library courier service.

d. Physical Facilities

The Davis School 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 four computer classrooms used for instruction of CIS classes (DH 203, DH 204, DH 303, DH 304). DH 203 and 204 each have 25 computer stations, while DH 304 has 30 and DH 303 (where the majority of the upper division CISB courses are taught) has 20. Any specialty software is housed in DH 303 where students can be granted key-card access for team and/or individual 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.

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 Program Operation

The main expense with the CISB program is that of personnel. One efficiency, albeit a negative one, is that of running many courses with adjunct faculty. While adjunct faculty bring a wealth of experience to the classroom, they are not expected to produce scholarship, advise students, or serve on committees, leaving these duties to the shrinking pool of tenured and tenure track faculty in the CISB program. By not having the full-time faculty in the lower level courses, it is difficult to attract and retain CISB majors into the program

Software is another area where the CISB faculty are running an efficient program. The CISB faculty utilize the Microsoft suite (licensed by CMU) to teach spreadsheets (CISB 205, 305, 241, 341) and databases (CISB 205, 306). The open-source MySQL is used for the senior level database course (CISB 451), and one-year licenses are obtained, for free, for Tableau, the visualization tool used in CISB 342.

5. Student Learning Outcomes and Assessment

a. Student Learning Outcomes

The CISB program recently (Davis School of Business faculty meetings in Spring 2021 semester) approved aligning the BS and BAS in CISB SLO's to the BBA SLO's. These are listed in Table 5.1, along with the courses in which each SLO is assessed.

Table 5.1: CISB Program SLO's

1	Analyze business issues critically utilizing appropriate research methodologies. (Critical Thinking)	ECON201; ECON202; ACCT201; CISB241; MANG201; CISB210; FINA301; MANG301; HRMA371; CISB341; MANG471; MANG491	Course embedded; exam questions
2	Apply business knowledge and skills in appropriate business contexts. (Critical Thinking)	ECON201; ECON202; BUGB231; CISB210; FINA301; MANG301; HRMA371; CISB341; MANG471; MANG491	Course embedded case study; Rubric
3	Communicate clearly, appropriately, and persuasively to the audience in writing. (Communication Fluency)	BUGB211; MANG301; HRMA371; CISB341; MANG471	Course embedded case study; Literature reviews; Rubric
4	Communicate clearly, appropriately, and persuasively to the audience orally. (Communication Fluency)	BUGB211; CISB341; MANG471; MANG491	Demonstration; Final Presentations, F2F & Virtual
5	Differentiate various functions of teams within organizations. (Specialized Knowledge/Applied Learning)	BUGB211; MANG201; MANG301	Course embedded; exam questions
6	Demonstrate behaviors consistent with effective teamwork. (Specialized Knowledge/Applied Learning)	BUGB211; CISB341; MANG471; MANG491	Demonstration; observation during team scenario; rubric
7	Analyze an issue within an ethical framework. (Specialized Knowledge/Applied Learning)	ACCT202; MANG201; FINA301; MANG301; HRMA371; BUGB440; MANG491	Embedded simulation; ELI inventory
8	Recommend a solution based on an ethical framework. (Specialized Knowledge/Applied Learning)	ACCT202; MANG201; FINA301; MANG301; HRMA371; BUGB440; MANG491	Embedded simulation; ELI inventory

The current curriculum map can be found in Appendix B, and each of the eight program SLO's contribute to the CMU SLO's as listed in the parenthetical statement in Table 5.1, column 2.

b. Direct and Indirect Measurements of SLO's

Outcome 1 for the CISB program is:

> Demonstrate a mastery of the computer information systems body of knowledge appropriate for the bachelor's degree level.

This outcome has been the same since 2003 when the CISB program faculty decided to follow a nationally normed curriculum model, then, the IS 2002, later, the IS 2010, currently the CC 2020. Each of these curriculum models had a nationally normed exam (aligned with the curriculum model) which reports aggregate (percentile student scored in nationally) as well as disaggregated data (percentage of CMU students who missed base level SLOs from the curriculum model). This exam is the ISA's ICCP exam.

- Note: The outcomes document is included as Appendix F, and is in need of rewrite/adjustment as the CISB program continues to evolve and assess program and course SLOs in more than two classes as listed in the document in Appendix F.

The CISB program at CMU participates in the Institute for Certification of Computing Professionals (ICCP) Information Systems Analyst (ISA) exam each year. This exam measures course-level SLOs as well as program level SLOs in an information systems program. This exam aligns with the curriculum model (CC 2020) followed by the CISB program. This exam is administered as an end-of-program evaluation of the CISB graduates. If a student passes the exam, they are entitled to an industry recognized certification to begin their career. An example of the report (CMU's 2021 performance) is given as a spreadsheet accompanying this program review. The percentage pass rate for the Davis School of Business CISB seniors is given in Table 5.2. The overall percentages from 2003 – 2021 are given as Appendix D.

Table 5.2: CMU's CISB graduates pass rate on the ICCP ISA exam

Year	Percent of CISB 471 Students Passing the ICCP ISA Certification Exam
2015-16	7/8 = 87.5%
2016-17	6/8 = 75.0%
2017-18	9/13 = 69.2%
2018-19	8/13 = 61.5%
2019-20	13/16 = 81.3%
2020-21	5/9 = 55.6%

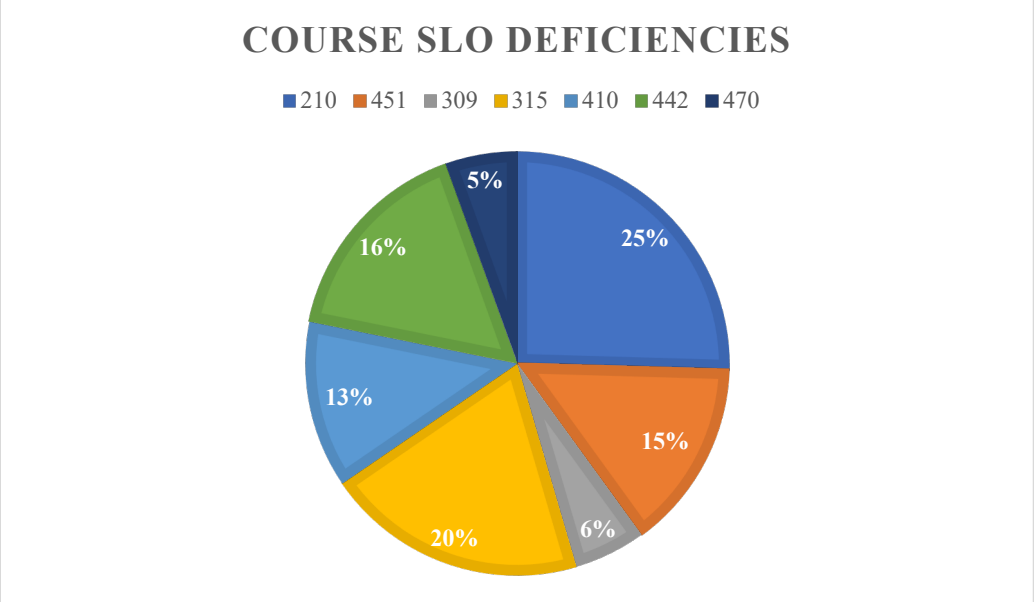
The benchmark for Outcome 1 since 2003 is that at least 50% of CMU CIS students will qualify for ISA-Practitioner certification. That qualification requires an average score of 50% on the two parts of the ISA Exam (Parts A and B taken on two separate days). CMU's CISB students are accomplishing the 50% pass rate consistently as can be seen in Table 5.2 and Appendix D.

In addition to the overall certification exam pass rate, summative analysis of how students performed on each question is reported. This data is rank ordered (putting the most missed

questions first), then aggregated by CISB course then analyzed by the department faculty teaching the course for deficiencies in students' understanding of the SLO's. This enables the incorporation of low performing SLO topics to be reinforced in coming semesters. Graph 5.1 illustrates the results of aggregation of the most missed questions on the Spring 2021 ISA exam. Interpretation notes include:

- 20% (for example CISB 315 in Graph 5.1) is approximately seven questions
- The ISA exam covers seven core topics in the curriculum model with 266 questions taken over two days
- The missed questions have the associated learning units mapped, so that faculty can analyze where weaknesses in understanding are occurring (the CISB course mapping is done by the CISB faculty)
- An example of the spreadsheet used for this analysis is given as Appendix C

Graph 5.1: Aggregated data from the ISA exam by course



Outcomes 2-6 align with the DSB BBA SLOs which the CISB program recently aligned to as well (by a faculty vote in Spring 2021). These are given in Table 5.1 and are an ongoing component of our school wide CiC (Continuous improvement Committee). CISB has a committee position on the CiC and CISB courses are routinely used to evaluate the DSB SLOs as can be seen in Appendix E.

Outcome 7 states:

Properly and appropriately use information systems tools and techniques within functional business areas.

The benchmark for Outcome 7 is given as:

For CISB 471, 80% of students should score at the proficient level.

This outcome is evaluated via a rubric for the team project in CISB 471 and the rubric is scored by all CISB faculty.

Overall, the CISB program monitors its breadth of program SLO's by aligning the program SLOs with the departmental (BBA) SLOs and by participating on the CiC. The CISB program monitors the depth of program SLOs by aligning the curriculum with a nationally normed curriculum model, and an end-of-program certification exam (the ICCP's ISA exam). The CISB students are hitting all targets set for them, indicating a strong curriculum and delivery method.

Finally, one of the strongest indicators of a program's success is the employment rate of its graduates and if program graduates feel prepared once in the professional workplace. Tables 5.3 – 5.4 illustrate the employment and preparedness of the CISB graduates, from the past six years, surveyed by CMU's Institutional Research Department. The data shows that 90% felt prepared for their careers, with 95% reporting full-time employment.

Table 5.3: Employment status of CISB graduates

Are you working now?	**n**	**%**
Yes, full-time	19	95.0%
Yes, part-time	0	0.0%
No	1	5.0%

Table 5.4: Preparedness of graduates for work life

How well did CMU prepare you for your current career?	**n**	**%**
Very Well	2	10.5%
More than Adequately	9	47.4%
Adequately	6	31.6%
Less Than Adequately	2	10.5%
Very Poorly	0	0.0%
NA	0	0.0%

Graduates surveyed also took the time to provide written comments which can be seen in the overall report in the supporting documents folder. Some of the comments included:

* a need for more Tableau and/or BI (data analytics)
* a need for more programming – Python was specifically mentioned
* a need for more project management
* the favorable class size
* AITP (student club) and Computer Heroes helped in employability
* CISB 471 project helped in employability

These comments align with the current trajectory of the CISB curriculum and course additions for the CISB program.

The CISB program will continue to monitor the program level SLO's along with the BBA assessments and will continue to utilize the ICCP ISA exam to analyze individual course SLO's.

c. Program improvements resulting from assessment of SLO's

Ethics lecture and assignment added to CISB 341 in response to the new CMU ethics SLO. Course SLO's addressed by faculty in response to ICCP ISA exam results and analysis on an annual basis.

d. Indicate if SLO's are being refined or data collection is being modified

The BS in CISB recently aligned its SLO's with the BBA SLO's. Refinement of the SLO's is an ongoing process in the Davis School of Business. Collection of data for assessment can be seen in Table 5.1 and is ongoing in the DSB.

6. Future Program Plans

a. Vision for program

The CISB program strives to maintain currency in the ever changing and evolving landscape of information systems and data analytics. By aligning the CISB course offerings with the nationally accepted curriculum models presented in the CC 2020, DSB graduates are able to compete in the national employment market.
The need for graduates in the CISB arena continues to grow and has been increasing due to the ongoing pandemic and the lack of visas for technology workers.
Given more faculty members in the CISB area would enable the program to keep pace with the rapid evolution of the discipline. Classes in NoSQL could be added to enhance the students understanding of non-relational databases, programming courses could be tuned to business needs, courses in Emerging Technology as well as IS Strategy, Management & Acquisition could be offered to our students. Having more faculty in the program would give the CISB students breadth of topic coverage from multiple viewpoints.

b. Strengths and challenges facing program

Strengths:

- Current relevant curriculum model
- Quality facilities and instruction
- Quality faculty who update their skill sets and participate in scholarly activities
- Quality students who participate in extracurricular activities

Challenges:

- Attracting and retaining quality faculty (SA qualified per AACSB)
- Keeping faculty skill levels aligned to industry trends and needs
    - Python and Big Data
    - Tableau
    - NoSQL databases (Hadoop and Mongo)

Appendix A – Faculty Vitas

Johnny Snyder

Colorado Mesa University • Davis School of Business
1100 North Avenue • Grand Junction • Colorado • 81501
(970) 248-1722 • Faculty Profile
josnyder@coloradomesa.edu
February 2021

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; Davis School of Business, Computer Information Systems and Business Analytics, 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, Department of Business, 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 assistant manager, ski lift operator and ski patrol, warehouse (shipping/receiving), construction trades and remodel work, restaurant and kitchen work.

Teaching:

Master's Committees/Advisement:

Megan Lewin (MBA), 2018
Factors Influencing Intention to Choose a Business Analytics Program
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:

Student Showcase, 2021
Sponsored four teams in the Analytics track
GoCodeColorado, 2021
Supervised four student teams who qualified into the Statewide Finals
The teams placed as:
Mavucation – 3rd place ($5,000 prize)
WhoCares – 2nd place ($10,000 prize)
WhoCares – People's Choice Award (Bragging Rights!)
GoCodeColorado, 2019
Student/Faculty team - Statewide Finalists
CISB 471 Teams (13 students, 2 teams), 2019
Student Showcase Presentation
CISB 471 Team (13 students), 2018
Student Showcase Presentation
Megan Lewin (3+2 MBA), 2018
Student Showcase Paper
Corey Jimerson (Finance/Economics), 2015
Student Showcase Paper
***Best in Track Award**

Mark Boomgaard (Computer Information Systems), 2015
***First Place, Microsoft Office Solutions, Second Place, Business Analysis, AITP National Collegiate Conference**
Jordan Fisher (Computer Information Systems), 2015
***Second Place, PC Troubleshooting AITP National Collegiate Conference**
Zach Horrall (Computer Information Systems), 2015
***First Place, Microsoft Office Solutions, Second Place, Business Analysis, AITP National Collegiate Conference**
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 CS 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), Chihuahua, Mexico 2003-2005	GBA 5309, Quantitative Analysis and Decision Theory (MBA) GBA 5304, Management Information Systems (MBA)
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 CISB 210, Fundamentals of Information Systems CISB 241, Business Analysis CISB 305, Solving Problems Using Spreadsheets CISB 306, Solving Problems with Databases CISB 315, Information Systems Infrastructure CISB 341, Quantitative Decision Making CISB 342, Data Mining and Visualization CISB 395, Independent Study – Computer Heroes 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) EDUC 497, Methods of Teaching Secondary Mathematics EDUC 580, Secondary Instructional Methods for Mathematics
University of the Philippines, Cebu City Fall 2017	MGT 197, Data Analytics

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 – 2020	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.
Colorado Mesa University 2017 - 2020	FYI – Freshman Year Initiative Instructor for incoming freshmen on "how to survive" in the university. Topics include study skills and habits, time and money management, learning styles, career options, ethics in the academy, degree options, and independent living.
University of the Philippines Lahug, Cebu City, Cebu Fall 2017	While on sabbatical, I taught a course in Data Analytics (MGT 197) to 38 fourth year (senior) management students. This was a challenging assignment, as the economic situation in the Philippines necessitated teaching without a textbook, so I used online resources as well as lecture notes, examples, and PowerPoints.

University of Cebu, Cebu City, Philippines Fall, 2017	Evaluator for PhD candidates at this 60,000+ student institution. A panel of three evaluators scored the presentations of six PhD candidates after they presented their dissertation research.
Mindanao State University Bolton, Davao City, Philippines January, 2019	Delivered two invited lectures to student groups of business majors. This lecture discussed the current state of data analytics in business and the emerging tools and methods for data analysis.
Cebu Normal University, Cebu City, Philippines July, 2019	Delivered a three-day seminar on the use of Talbeau, a data visualization tool, to faculty from the Institute of Applied Mathematics and Physics. This workshop was intended to stimulate research and grant writing activities within the Institute, as well as the university.
National Autonomous University of Nicaragua (UNAN) May, 2021	Delivered a series of lectures and workshops on data, data visualization and the use of Tableau (software package) to do data visualizations.
GoCode Colorado 2019 - Present	As a component of my data mining and visualization course, student teams are required to submit their projects, using publicly available date, to the GoCode Colorado competition. I have coached/led many teams to the finals competition in this state-wide crowd-sourced competition. **2019 – One team** Colorado Restaurant Assistant – Informing restaurant decision makers for success Utilizing public data on restaurants, private data from the Colorado Restaurant Association, Yelp! and Google Maps ratings by consumers, and other data, an analytic and geospatial model is created to better inform restaurant decision makes as to where to locate, as well as which variables are germane to restaurant success. **2020 – Covid!** **2021 – Four teams** MaverickHousingAnalysis - Investigating rising home prices in Mesa County. Home prices in Mesa county have risen drastically since 2014. This analysis investigates how estimated population, state goods, and state personal expenditures influence the average sale price of a home over time. The analysis shows prices differ based on location and home prices

	increase when state goods and estimated population increase. Mavucation - Assessment of Mesa County Valley School District 51 Performance Team Mavucation compares Mesa County Valley School District 51's high school performance to schools across Colorado seeking prospects for improving teacher performance while simultaneously fostering student learning but find inconclusive results suggesting current data collection approaches may be misdirected and should be further developed. **3rd place in this statewide competition ($5,000 prize)** UnmaskingTheData - The Continuing Need for Broadband: COVID-19's Influence Broadband availability, capabilities, and access have been prevalent issues in the state of Colorado. The emergence of COVID-19 exemplifies the need for broadband and further intensified its demand. With new lifestyle changes brought about by COVID-19, broadband is needed now and, in the future, more than ever. WhoCARES - PPP Loan Distribution and Effectiveness in the Age of COVID-19 The Payroll Protection Program (PPP) loan was introduced to assist small businesses in paying employees, rent, and other allowable expenses during the COVID-19 pandemic. This submission will analyze loan distribution and effectiveness throughout Mesa County using data from Colorado Information Marketplace and the Small Business Administration (SBA) websites. **2nd place in this statewide competition ($10,000 prize)** **&** **People's Choice Award!**

Scholarly Achievements:

Articles appearing in Journals:

Snyder, J. and Tan, T. (2020). Ethical Awareness in the Age of Analytics: Views from

the United States and the Philippines. *Review of Integrative Business and Economics Research*, 9(s4), 340-357. (AACSB IC: T&L, PRJ, Fall 2020)

Baldo, C., Snyder, J., and Holguin, A. (2020). Revisiting the Online vs. Face to Face teaching evaluations. *International Journal of Education and Development Using Information and Communication Technology*, 16(2). (AACSB IC: T&L, PRJ, Spring 2020)

Snyder, J. (2019). Data Cleansing: An Omission from Data Analytics Coursework. *Information Systems Education Journal*, 17(6), p. 22-29. (AACSB IC: T&L, PRJ, Fall 2019)

Snyder, J. (2019). Teasing Information out of a Time Series: Index Numbers and the Multiplicative Model. Sage Research Methods Cases Part 2. doi: 10.4135/9781526466488 (October, 2019) (AACSB IC: T&L, PRJ, Fall 2019)

Snyder, J. and Slauson, G. (2016). Differences in Males and Females in When and Why They Become Interested in Information Systems Majors. *Information Systems Education Journal,* 14(1), p. 4-14. (AACSB IC: T&L, Spring 2016))

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,* 12(3), p. 59-66.

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. (2018). Data Cleansing: An Omission from Data Analytics Coursework. EDSIG/CONISAR (AACSB Applied)

Snyder, J. (2016). Evidence of Wikipedia usage during the school year: A numerical study. CONISAR (AACSB Applied)

Snyder, J. (2015). Numerical Evidence of Students' Use of Wikipedia. IABPAD 2015.

Snyder, J. and Slauson, G. (2015). Differences in Males and Females in When and Why They Become Interested in Information Systems Majors. EDIGSIG 2015.
***Distinguished Paper Award**

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

"Not necessarily what you think: Comparing candidates' expectations and perception in relationship with executive recruiters", Southwest Academy of Management virtual conference, March 2021

"Data Cleaning: Enhancing the integrity of the Cities and Municipalities Competitiveness Index (CMCI) database", October 27, 2020 **Third Place Award** at the 2020 CMCI Academic Symposium (Co-authored with Dr. Gretchen Chaves of the University of the Philippines, Lahug, Cebu) (AACSB Applied)

"Numerical Evidence of Students' Use of Wikipedia" October, 2015
The International Academy of Business and Public Administration Disciplines (IABPAD) Conference Las Vegas, Nevada (AACSB Applied)

"Report on the National Collegiate Conference" May, 2015
Mile High Chapter of the AITP Monthly Meeting; Denver, Colorado
(Invited presentation including student presenters: Kaemen Chiles, Mark Boomgaard, Jordan Fisher)

"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; October 2015
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
The International Academy of Business and Public Administration Disciplines (IABPAD) Conference, October, 2015
EDSIG/CONISAR
November, 2018
INFORMS Analytics Conference (virtual)
May, 2020

Professional Affiliations:

EDSIG AITP Education Special Interest Group

INFORMS Institute for Operations Research and the Management Sciences

Educational Activities:

Tableau (Visualization Software)
Analyst Skills Assessment, March, 2020
Data Scientist Skills Assessment, March, 2020
Desktop I, II, III Certificate, Jan. – March, 2020

Structural Equation Modeling – an introduction, UP API
October, 2017

Introduction to data mining with R, UP API
September, 2017

Going Places with Spatial Analysis, ESRI MOOC
October 2015

Location Advantage, ESRI MOOC
June 2015

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
Summer 2016	US Fulbright Teaching/Research Grant	Not Awarded	
Fall 2016	Vice President of Academic Affairs, Colorado Mesa University; Faculty Professional Development Fund	Awarded	$650
Fall 2018	Vice President of Academic Affairs, Colorado Mesa University; Faculty Professional Development Fund	Awarded	$1,000

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
2015	Track Chair, Mountain Plains Management Association Annual Conference, CIS Track
2016	Track Chair, Conference for Information Systems Applied Research
2017	Evaluator for PhD Candidate Defense Presentations, University of Cebu
2019-2022	Fulbright Specialist Roster

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 - 16	Search Committees (Computer Science, two positions; Computer Information Systems, two positions)
2012 - 21	Faculty Senate (Vice-President 2013-2015; President Elect 2015-2016; President 2016-2017; President Elect 2018-2019; President 2019-2020)
2015 -	Departmental Retention Committee (Chair)
2016 -	AACSB Departmental Steering Committee
2017 -	AACSB SA Committee Chair
2018	Search Committees (Computer Information Systems, Entrepreneurship)
2019	Search Committees (Computer Science, Quant/OpsMgt)
2021	Search Committee Chair (Computer Information Systems)

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 - 17	Member, Board of Directors, Little Mavericks Learning Center
2018	Judge, Fourth Grade Science Fair, Dual Immersion Academy

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 year-long 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 – 2019)

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/D2L 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)

Graduate (MBA) Admissions Working Group, University of the Philippines, Cebu City

As a member of this working group, we formulated admissions standards, tests, and interviews in an attempt to stem the attrition from the MBA program (most attrition is attributed to job and family changes). In doing so, the working group hopes to accept candidates into the MBA program who will stay until completion of their degree.
(Fall, 2017)

Curriculum Development at University of the Philippines, Cebu City

I was asked to develop and deliver a course on data analytics to the fourth year students in the management program. This course consisted of utilizing real-world data sets to illustrate how tools such as Excel, the data analytics add-in in Excel, and PHStat can be used to gain business insight and information from raw data. The class was run utilizing web-based resources.
(Fall, 2017)

Software Proficiencies:

Programming: Fortran, Pascal, VRML, Java, VBA, R, Python
Operating Systems: Windows, Mac, UNIX, LINUX, Dos
Software: Word Processor, Presentation Tools, Spreadsheet Tools, SPSS, Stat View, PhasePlane, LocBif, ArcGIS, Oracle/SQL, MySQL, Tableau…
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 fellow faculty member for Distinguished Faculty Award,
2013-2014, 2018-2019
Distinguished Paper Award, ISECON 2015

Appendix B – CISB Curriculum Map

BBA Degree - Curriculum Map

COURSES		Credit Hrs	SLO #1 Critical Thinking		SLO #2 Effective Communication Skills		SLO #3 Teamwork		SLO #4 Ethical Awareness		AACSB General Business Skills (GS) (See legend below)								AACSB General Business Knoweldge (GK) (See legend below)						
			1.1	1.1	2.1	2.2	3.1	3.2	4.1	4.2	GS1	GS2	GS3	GS4	GS5	GS6	GS7	GS8	GK1	GK2	GK3	GK4	GK5	GK6	GK7
Essesntial Learning Courses		37																							
Foundation Courses																									
ECON 201	Prin. Of Macroe	3	X	X									X					X	X		X			X	
ECON 202	Prin. Of Microec	3	X	X									X				X	X	X		X			X	
ACCT 201	Accounting I	3	X	X								X	X					X	X	X	X			X	
ACCT 202	Accounting II	3							X	X		X	X					X	X	X	X			X	
BUGB 211	Bus Comm	3			X	X	X	X			X				X	X		X							
BUGB 231	Business Law	3	X	X							X	X	X					X	X	X				X	
CISB 241/Sta	Bus Analysis	3	X	X									X	X				X	X		X			X	
Core Courses																									
MANG 201	Prin of Managm	3	X	X			X		X	X		X			X	X	X	X		X			X	X	
MARK 231	Prin of Marketin	3														X		X			X	X		X	
CISB 210	Fund. of Info	3	X											X				X	X			X		X	
FINA 301	Managerial Fina	3	X	X					X	X		X	X					X	X	X	X			X	
MANG 301	Org Behavior	3	X		X		X	X	X	X	X	X			X	X	X	X		X			X	X	
HRMA 371	HRM	3	X		X				X	X	X	X	X		X	X		X	X	X				X	
CISB 341	Quant Decision	3	X	X	X	X		X					X					X			X			X	
BUGB 440	Business Ethics	3	X						X	X	X	X				X		X	X	X				X	
MANG 471	Op Managemt	3	X	X	X	X	X	X			X		X	X	X			X				X		X	
MANG 491	Strategy	3	X	X		X	X	X	X	X	X	X	X		X		X	X	X	X		X		X	
Concentration Courses		15																							X
General Electives		17																							
Total Credits >>>>>>>>>>>>>>>>		**120**																							

AACSB General Skills (GS)

- Written & oral communication (able to communicate effectively orally and in writing) **(GS1)**
- Ethical understanding and reasoning (able to identify ethical issues and address the issues in a socially responsible manner) **(GS2)**
- Analytical thinking (able to analyze and frame problems) **(GS3)**
- Information Technology (able to use current technologies in business and management contexts) **(GS4)**
- Interpersonal relations & teamwork (able to work effectively with others and in team environments) **(GS5)**
- Diverse & multicultural work environments (able to work effectively in diverse environments) **(GS6)**
- Reflective thinking (able to understand oneself in the context of society) **(GS7)**
- Application of knowledge (able to translate knowledge of business and management into practice) **(GS8)**

AACSB General Business Knowledge (GK)

- Economic, political, regulatory, legal, technological, and social contexts of organizations in a global society **(GK1)**
- Social responsibility, including sustainability, and ethical behavior and approaches to management **(GK2)**
- Financial theories, analysis, reporting, and markets **(GK3)**
- Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution **(GK4)**
- Group and individual behaviors in organizations and society **(GK5)**
- Information technology and statistical / quantitative methods impacts on business practices to include data creation, data sharing, data analytics, data mining, data reporting, and storage between and across organization including related ethical issues **(GK6)**
- Other specified areas of study related to concentrations, majors, or emphasis areas **(GK7)**

Appendix C – ICCP ISA questions analyzed for SLO comprehension (shortened for illustration)

Local	National	Delta	CISB Course Where Topic Covered	Q#	Course Outline area	Knowledge Area	LU	LU DESCR
0	26.4	-26.4	470	119b	7.2.5	Determining Staffing Skills and Allocation Models	5	Structure IS-related activities to maximize the business value of IS within and outside the company.
22.2	47.9	-25.7	470	117b	7.2.2	Managing the Information Systems Function	1	Understand the various functions and activities within the information systems area, including the role of IT management and the CIO, structuring of IS management within an organization, and managing IS professionals within the firm.
0	12.4	-12.4	470	41b	7.1.2	IS Strategic Alignment	2	View an organization through the lens of non-IT senior management in deciding how information systems enable core and supportive business processes as well as those that interface with suppliers and customers.
0	35.3	-35.3	451	54	2.2.2	Entity-Relationship Model	6	Use at least one conceptual data modeling technique (such as entity-relationship modeling) to capture the information requirements for an enterprise domain.
33.3	54.2	-20.9	451	47	2.1.1	Types of Database Management Systems	1	Understand the role of databases and database management systems in managing organizational data and information.
22.2	43.1	-20.9	451	62	2.2.8	Normalization	9	Understand the purpose and principles of normalizing a relational database structure.
11.1	30.8	-19.7	451	127	2.4.3	Database Administration	13	Perform simple database administration tasks.

Appendix D – ICCP ISA exam pass rates, 2003 – 2021

Spring	CMU CIS ISA takers	Info Systems Analyst-Practitioner	Info Systems Analyst-Mastery
2003	19	15	3
2004	28	18	0
2005	8	1	0
2006	21	13	3
2007	6	5	1
subtotal	82	52 (63.4%)	7 (8.5%)
2002-2007 program review		59 (72%)	
2008	4	2	0
2009	6	5	0
2010	11	7	2
2011	8	8	0
2012	12	9	0
2013	5	4	0
2014	11	11	0
subtotal	57	46 (80.7%)	2 (3.5%)
2008-2014 program review		48 (84.2%)	
2015			
2016	8	7	0
2017	8	6	0
2018	13	9	0
2019	16	13	0
2020	16	13	0
2021	9	5	0
Subtotal	70	53 (75.7%)	0 (0%)
2016-2021 Program Review		53 (75.7%)	
Total	**209**	**151 (72.2%)**	**9 (4.3%)**
Total Qualified		**160 (76.6%)**	

Appendix E – Most recent assurance of learning report from the DSB CiC

Semester:	**Fall 2020 – Spring 2021**	**Date of this document:**	**June 6, 2021**	**Status**
Contacts:	Continuous Improvement Committee:			
	Dr. Sanders Via (Chair); Dr. Perry; Dr. Lee; Dr. Chapman; Dr. Hatten; Dr. Ongaki; Dr. Walter; Dr. Stone; Christine Noel (ex officio)			

Mission (Adopted Spring 2016): As a student-focused teaching and research department, Colorado Mesa University's Business Department prepares students to be sound decision makers and serves businesses in the Rocky Mountain region, the nation, and the world. We strive to develop prepared students who demonstrate strong ethical principles, superior critical thinking, effective communication, and robust business acumen.

Student Learning Outcomes BBA, BAS, BS (Revised and Adopted 03/10/2021)

SLO #1: Critical Think

- **1.1-** Apply business knowledge and skills in appropriate business contexts. (Specialized Knowledge/Applied Learning)
- **1.2-** Analyze business issues critically utilizing quantitative research methodologies. (Quantitative Fluency)
- **1.3-** Analyze business issues critically utilizing qualitative research methodologies. (Critical Thinking)

SLO #2: Effective Communication S s

- **2.1-** Communicate clearly, appropriately, and accurately to the audience in writing. (Communication Fluency, Information Literacy, Specialized Knowledge/Applied Learning)
- **2.2-** Communicate clearly, appropriately, and accurately to the audience orally. (Communication Fluency)

SLO #3: Teamwor

- **3.1-** Differentiate various functions of teams within organizations. (Specialized knowledge/applied learning)
- **3.2-** Demonstrate behaviors consistent with effective teamwork. (Specialized knowledge/applied learning)

SLO #4: Ethical Awareness and Societal Impact

- **4.1-** Analyze an issue within an ethical framework. (Personal and Social Responsibility)
- **4.2-** Recommend a solution based on an ethical framework. (Critical Thinking)
- **4.3-** Engage in a local, regional, national, and/or international activity that positively impacts society. (Personal and Social Responsibility)

Narrative:

As a part of a campus-wide focus on aligning departmental student learning outcomes more closely with institutional student learning outcomes the Davis School of Business addressed the following updates:

SLO #1: Quantitative Fluency

To better reflect the CMU learning outcome *Quantitative Fluency*, the department edited SLO #1 to specifically include the words "Quantitative or Qualitative" in January 2021. However, we based on a review from VPAA Bridge, concerns were highlighted regarding the option for quantitative OR qualitative, thus revisions were made to clarify the SLO which ultimately reverted to our SLO from 2018-2019, naming qualitative and quantitative in separate SLO's and moved 1.2 to the 1.1 slot to help keep reporting streamlined.

SLO #1: Critical Thinking

- **1.1-** Apply business knowledge and skills in appropriate business contexts. (Specialized Knowledge/Applied Learning)
- **1.2-** Analyze business issues critically utilizing quantitative research methodologies. (Quantitative Fluency)
- **1.3-** Analyze business issues critically utilizing qualitative research methodologies. (Critical Thinking)

SLO #2: Effective Communication Skills

To better reflect the CMU learning outcome *Communication Fluency*, the department edited the SLO to specifically replace the word "persuasively" with the word "accurately", as not all communications are intended to be persuasive.

SLO #2: Effective Communication Skills

- **2.1-** Communicate clearly, appropriately, and accurately to the audience in writing. (Communication Fluency, Information Literacy, Specialized Knowledge/Applied Learning)
- **2.2-** Communicate clearly, appropriately, and accurately to the audience orally. (Communication Fluency)

SLO #4: Ethical Awareness and Societal Impact

With the adoptions of the 2020 AACSB standards, the new Standard 9 focusing on "Societal Impact" has been integrated into our "Ethical Awareness? And will allow the DSB to intentionally dedicate resources to this important area.

SLO #4: Ethical Awareness and Societal Impact

- **4.1-** Analyze an issue within an ethical framework. (Personal and Social Responsibility)
- **4.2-** Recommend a solution based on an ethical framework. (Critical Thinking)
- **4.3**- Engage in a local, regional, national, and/or international activity that positively impacts society. (Personal and Social Responsibility)

Note: The color code used for the status updates indicate a level of confidence that SLO's are being met consistently and are sustainable.

🔴 = SLO not met or shows inconsistency thus unreliable.
🟡 = SLO outcomes are moving in the right direction; showing consistency but not reliable.
🟢 = SLO outcomes met expectations; show consistency and are reliable.

Recommended actions:

The DSB intended to measure progress in this area via several metrics. As this is a new standard, the DSB will establish a baseline this year and ensure we are making progress year over year. Each metric should be geared towards a specific activity. Rather than relying on boiler-plate metrics, we will measure progress on a case-by-case basis with an eye towards whether, and to what extent, that activity results in improved economic, social, diversity, or inclusion opportunities for individual segments within our community. These measurements could include:

- Post-project stakeholder surveys;
- Number of external stakeholders served and region of impact;
- Number of students engaged in societal impact projects;
- Number of class projects working with external stakeholders; and
- Community/regional surveys (each 5-year accreditation period).

Summary of Close Loop Activities:

SLO#1 Critical Thinking –

- *Moved SLO 1.2 into the 1.1 position*
- *Reverted to the 2018-2019 wording for SLO 1.2 and 1.3, which will require separate evaluation of qualitative and quantitative methodologies.*
- *Assessed SLO 1.1 Critical Thinking Fall 2020 and DID NOT MEET expectations.*

SLO#2 Communication –

- *Updated the SLOs to replace the word "persuasively" with the word "accurately" in both SLOs.*
- *Review and update rubrics to accommodate for online presentations to be evaluated against the same standards as face-to-face presentations.*
- *Assessed 2.2 Oral Communication and MET expectations.*

SLO#3 Teamwork –

- There was no assessment of SLO#3 during the Fall 2020- Spring 2021 academic year.
- SLO 3.2 will be assessed in Spring 2022.

SLO#4 Ethical Awareness and Societal Impact –

- *Added the words "Societal Impact" to SLO#4 to align with AACSB Standard 9.*
- *Created SLO 4.3 and developed a survey to capture DSB faculty and student activities that impact society.*
- *Assessed SLOs 4.1 and 4.2 and MET expectations.*

COLORADO MESA UNIVERSITY
DEPARTMENT OF BUSINESS

Assurance of Learning Report
AY20-21 – BBA, BAS, BS Degree Programs

Goal:	**1. Critical Thinking**		Current status
Objective:	1.1 - Apply business knowledge and skills in appropriate business contexts.		
Semester:	Fall 2020	Date of this document: June 6, 2021	
Contacts:	Nathan Perry		

Last 3 assessments, oldest first

Semester	Course	Method	Artifact	Results	Status
FA15	MANG471	Course Embedded	H&S Motors	55% Met or Exceed	
FA17	MANG341	Course Embedded	Exam Question	62% Met or Exceed	
SP18	MANG471	Course Embedded	Southwest Airlines Case	80% Met or Exceed	
FA18	MANG471-003 MANG471-001	Course Embedded	Southwest Airlines Case Study	57% Met or Exceed	
SP19	CISB341	Course Embedded	Exam Questions	83% Met or Exceed	
FA19	MANG471	Course Embedded	Southwest Airlines Case	81% Met or Exceed	
FA20	ECON201 ECON202	Course Embedded	Exam Questions	67% Met or Exceed	

Target for this SLO is at least 70% Meet or Exceed.

FA18 Sample Size = 30
SP18 Sample Size = 15
FA19 Sample Size = 21 (MANG 471-003; MANG 471-002)
FA20 Sample Size = 105

Narrative: This SLO was previously listed as 1.2 but moved to 1.1 during the spring 2020 term as part of several SLO revisions to bring the BBA SLO's into better alignment with the CMU institutional SLO's.

The assessment activity was administered in 3 ECON 201 classes in the final exam for each course. The problem was assigned in MacMillan's Sapling Plus and is a four-part question that asks about modeling recessionary activity with the aggregate supply/aggregate demand model. This is a model that students should feel comfortable using by the end of the semester. This was a four-part question, with shifts of the curve within the model and 2 multiple choice questions regarding inflation, deflation, and unemployment that results from the model.

Class 1 had an average of 75.8 with 33 students.
Class 2 had an average of 59.2 with 30 students.
Class 3 had an average of 65.5 with 42 students.
The weighted average was 66.94, which does not meet expectations.

Next Assessment: SPRING 2023
Recommended actions: Improve integration of concepts into the course and choose a question to evaluate that doesn't require students to get the first part correct in order to give the correct answer on the second part.
Close Loop Activities: After discussion with the ECON faculty, there were 2 points that came across: 1. This assessment exercise was a four-part problem, where missing the first part can cause students to miss the second part. Although we all felt the topic of the problem was reasonable, we may have selected a problem that had a lower-than-normal score due to the 4 parts. 2. We discussed as an ECON faculty how we could improve our integration of these concepts into the class, with the agreement to increase our exposure and emphasis on the topic.

COLORADO MESA UNIVERSITY
DEPARTMENT OF BUSINESS

Assurance of Learning Report
AY20-21 – BBA, BAS, BS Degree Programs

Goal: **1. Critical Thinking**		Current status
Objective: 1.2 - Analyze business issues critically utilizing quantitative research methodologies.		
Semester: Fall 2021	Date of this document: June 6, 2021	
Contacts:		

Last 3 assessments, oldest first

Semester	Course	Method	Artifact	Results	Status
SP16	ECON201 BUGB401 ECON202 MANG341	Course Embedded Course Embedded Course Embedded Course Embedded	Economic Systems Int. B-Case	31% Met or Exceed	
SP17	MANG341	Course Embedded	Exam Question	65% Met or Exceed	
FA18	CISB341-001 CISB341-002 CISB341-003	Course Embedded	Exam Questions	73% Met or Exceed	

Target for this SLO is at least 70% Meet or Exceed.
SP16 Sample Size = 267
SP17 Sample Size = 45
FA18 Sample Size = 112

Narrative:

Spring 2021- This SLO was revised again to better align with the CMU institutional SLO's and divided back into two SLO's that assess quantitative and qualitative data separately.

See below 'close loop activities' for details.

No assessment occurred on this AY20-21. In past assessments, students were given two embedded questions on their final exam. The first question had them match descriptions of business scenarios to the appropriate analytical technique. Thus, they had to analyze the scenario as well as synthesize information from the current course as well as the prerequisite. The second question asked them to solve a linear programming solution in a new context.

Next Assessment: Fall 2021

Recommended actions: Review and update the rubric previously used to assess the SLO quantitatively to ensure that it is still valid and use it to assess this SLO in Fall 2021.

Close Loop Activities:

To better reflect the CMU learning outcome *Quantitative Fluency*, we edited the SLO to specifically include the words "Quantitative or Qualitative" in January 2021. However, we received feedback from the VPAA that the word 'or' in the SLO might send the message that quantitative research is optional. Therefore, we resorted to the 2018-2019 version of the DSB SLO #1 which named qualitative and quantitative in separate SLO's and moved 1.2 to the 1.1 slot to help keep reporting streamlined.

Goal:	**1. Critical Thinking**		Current status
Objective:	1.3 - Analyze business issues critically utilizing qualitative research methodologies.		
Semester:	Fall 2019	Date of this document: June 6, 2021	
Contacts:	Nathan Perry, Thomas Chapman, Kyle Stone		

Last 3 assessments, oldest first

Semester	Course	Method	Artifact	Results	Status
SP16	ECON201 BUGB401 ECON202 MANG341	Course Embedded Course Embedded Course Embedded Course Embedded	Economic Systems Int. B-Case	31% Met or Exceed	
SP17	MANG341	Course Embedded	Exam Question	65% Met or Exceed	
FA18	CISB341-001 CISB341-002 CISB341-003	Course Embedded	Exam Questions	73% Met or Exceed	

Target for this SLO is at least 70% Meet or Exceed.

SP16 Sample Size = 267
SP17 Sample Size = 45
FA18 Sample Size = 112

Narrative: Spring 2021- This SLO was revised again to better align with the CMU institutional SLO's and divided back into two SLO's that assess quantitative and qualitative data separately.

See below 'close loop activities' for details.

No assessment occurred on this AY20-21. In past assessments, students were given two embedded questions on their final exam. The first question had them match descriptions of business scenarios to the appropriate analytical technique. Thus, they had to analyze the scenario as well as synthesize information from the current course as well as the prerequisite. The second question asked them to solve a linear programming solution in a new context.

Next Assessment: Spring 2022

Recommended actions: Review and update the rubric previously used to assess the SLO qualitatively to ensure that it is still valid and use it to assess this SLO in Spring 2022.

Close Loop Activities:

To better reflect the CMU learning outcome *Quantitative Fluency*, we edited the SLO to specifically include the words "Quantitative or Qualitative" in January 2021. However, we received feedback from the VPAA that the word 'or' in the SLO might send the message that quantitative research is optional. Therefore, we resorted to the 2018-2019 version of the DSB SLO #1 which named qualitative and quantitative in separate SLO's and moved 1.2 to the 1.1 slot to help keep reporting streamlined.

Goal:	2. **Effective Communication Skills**		Current status
Objective:	2.1 - Communicate clearly, appropriately, and accurately to the audience in writing.		
Semester:	Fall 2019	Date of this document: June 6, 2021	
Contacts:	Suzanne Owens, Johnny Snyder, Georgian Jouflas		

Last 3 assessments, oldest first

Semester	Course	Method	Artifact	Results	Status
SP16	HRMA371	Course Embedded	Literature Review	92% Met or Exceed	
SP18	MANG471; FINA301	Course Embedded	SW Airlines Case Financial Market Paper	87% Met or Exceed	
FA19	MANG 201; MANG 491	Course Embedded	Article Review; Netflix Case	97% Met or Exceed	

Target for this sub-goal is at least 70% Meet or Exceed.

Spring 2016 Sample Size = 24
Spring 2018 Sample Size = 31
Fall 2019 Sample Size = 34 (MANG201 = 25, MANG 491 = 9)

Narrative: This outcome was met the last two assessment cycles. The Rubric used has been validated numerous times over the past few years and the assessment of writing has remained consistent. The lowest area of performance was Sources with an overall mean 2.47 (SD .89). Overall, all the mean scores were higher in all areas with the exception of "Sources" this assessment cycle than previous cycle.

Next Assessment: FALL 2021

Follow-up from previous semesters - The assessment has shown a slight improvement with "sources" being the lowest two out of three assessment cycles.

Recommended actions: Spring 2019 – A sub-committee (Owens, Snyder, Jouflas) reviewed previously collected data and brainstormed on ways to improve writing in the curriculum. Syntax and mechanics seem to be the weakest areas. Investigation revealed syntax and mechanics ARE NOT covered in ENGL 111 or 112. These two areas are covered in BUGB 211 and students must pass test on it pass the course. Many students stake BUGB 211 as juniors or seniors. It was probably too soon to see an impact this assessment cycle based on the improvements implemented in BUGB 211. The next assessment cycle in SP21 will provide more detail.

Close Loop Activities:
For written communication, the sub-committee presented recommendations during our Department meeting (4/17/2019) regarding improving writing. Specifically, we encouraged faculty to advise students to take BUGB211 as sophomores. In addition, faculty were asked to hold students accountable for not just content, but mechanics of the writing. Discussion occurred to consider making BUGB211 a prerequisite for another core business course in order to get students in the course earlier however, no decision was made.

Goal:	2. **Effective Communication Skills**		Current status
Objective:	2.2 - Communicate clearly, appropriately, and accurately to the audience orally		
Semester:	Spring 2021	Date of this document: June 6, 2021	
Contacts:	Richard Vail		

Last 3 assessments, oldest first

Semester	Course	Method	Artifact	Results	Status
FA14 / SP15	MANG491; MANG301; CISB341; BUGB211;	Demonstration Demonstration Demonstration Demonstration	Group Sim Pres. Lit Review Pres. Regression Pres. Elevator Pitch	63% Met or Exceed	
FA17	MANG301	Demonstration	Manager Pres.	98% Met or Exceed	
SP19	MANG471 MANG491	Demonstration	Final Presentations	100% Met or Exceed	
SP21	MANG491	Demonstration	Final Presentations	100% Met or Exceed	

Target for this sub-goal is at least 70% Meet or Exceed.

FA14 / SP15 Sample Size = 155
FA17 Sample Size = 43
SP19 Sample Size = 34
SP21 Sample Size = 42

Narrative: Business Strategy Game Team's Company Presentation which was posted in a D2L class discussion to be viewed by each class member. Team presentations were evaluated using the SLO 2.2 Rubric. The individual oral contributions of students were evaluated based on the Language and Delivery items on the Rubric.

Due to a COVID-19 related administrative decision to put the final week of the semester fully online, in-class presentations did not occur. The two online sections of MANG 491 had posted presentations planned into the schedule. These posted presentations were assessed.

All teams posted a good presentation. These presentations were recorded by the students, so the experience was different than a presentation in front of a class. Questions were handled through a D2L threaded discussion, which is different from answering questions in front of an audience.

Recorded team presentations do allow for the evaluation of individual team contributions.

Recordings were evaluated a significant time after grading the presentations. The focus was on rubric items, rather than on content. The evaluation of Delivery was limited by the fact that nearly all individual presentations were voiced over slides. This meant that "posture, gesture, eye contact" were not available to the evaluator.

Ensuring that these items are part of the assigned recorded presentations will require much more detailed instructions to the teams.

The assessed activity was in MANG 491 sections 001 and 005. This covered nine teams and a total of 42 students.

Next Assessment: FALL 23

Follow-up from previous semesters – The transition to online for the final week of the semester provided an opportunity to experiment with the issues raised in the 2019-2020 report by using recorded presentations. This allowed for evaluation of both team presentations and individual presenters.

Recommended actions: - Review and update rubrics to accommodate for online presentations to be evaluated against the same standards as face-to-face presentations.

Close Loop Activities: Initially, this assessment was intended to be done in two in class sessions of MANG 491. The activity to be assessed was the final BSG team oral reports to the class. The activity is scheduled during the final week of the semester. Due to COVID-19 related administrative decision to put the final week of the semester full online in class presentations did not occur. The two online sections of MANG 491 had posted presentations planned into the schedule. These posted presentations were assessed.

Goal:	3. **Teamwork**		Current status
Objective:	3.1 - Differentiate various functions of teams within organizations		
Semester:	Fall 2019	Date of this document: June 6, 2021	
Contacts:	Kyle Stone, Deb Parman, Christi Sanders, Steve Norman		

Last 3 assessments, oldest first

Semester	Course	Method	Artifact	Results	Status
SP18	MANG301	Embedded Exam	Quiz on Teamwork	70.4% Met or Exceed	
FA19	MANG301	Embedded Exam	Quiz on Teamwork	55% Met or Exceed	
SP20	MANG301	Embedded Exam	Quiz on Teamwork	95% Met or Exceed	

Target for this sub-goal is that average students score is at least 70% to Meet or Exceed.

SP18 – MANG301 Sample Size = 31
FA19 – MANG 301 Sample Size = 47 (MANG301-001 = 11; MANG301-002 = 11; MANG-005 = 25)
SP20 – MANG301 Sample Size = 41 (MANG301-001=21; MANG301-003=20)

Narrative: This was the second time we administered the same quiz on teamwork to our Organizational behavior courses. This was embedded within the three MANG301 courses at the end of the semester. Our original findings from SP18 assessment were adequate however, this assessment did not demonstrate our students ability to meet the minimum expectations of this SLO. A sub-committee will be formed SP 2020 to evaluate this SLO closely and formulate an action plan for improvement. Based on discussion within the sub-committee a new teamwork quiz was developed and deployed that was aligned with the new textbook changes made Fall 2019. This resulted in an improved the overall performance of this SLO. Lesson learned…when course materials are changed…..be sure to update the assessment documents too!

Next Assessment: Fall 2022

Follow-up from previous semesters: We repeated the same assessment with worse results in Fall 2019. Spring 2020 we modified the assessment quiz to reflect the new course materials with an improved expectation.

Recommended actions: A sub-committee was formed SP 2020 to evaluate this SLO closely and formulate an action plan for improvement.

Close Loop Activities: Continue to measure using revised quiz to ensure sustainability of this SLO.

In an effort of continuous improvement and based on the input of various stakeholders the wording of this SLO has been modified to be more measurable. The CiC committee also discussed the difference between “roles” and “functions” of teams and determined there could be confusion surrounding role of team members (e.g., note taker; task master; leader) vs. functions of team (e.g., cross-functional; problem-solving; self-directed; virtual).

COLORADO MESA UNIVERSITY
DEPARTMENT OF BUSINESS

Assurance of Learning Report
AY20-21 – BBA, BAS, BS Degree Programs

Goal: 3. **Teamwork**		Current status
Objective: 3.2 - Demonstrate behaviors consistent with effective teamwork		
Semester: Spring 2020	Date of this document: June 6, 2021	
Contacts: Christi Sanders, Steve Norman, Deb Parman, Richard Vail		

Last 3 assessments, oldest first

Semester	Course	Methods	Artifact	Results	Status
FA15	MANG491	Indirect – Survey	CATME – ENTR	95.4% Met or Exceed	
FA15	MANG471	Indirect – Survey	CATME – Site Visit	93.4% Met or Exceed	
SP19	MANG491-003 MANG491-002	Demonstration	Google Walkout Group Scenario	69% Met or Exceed	
SP20	MANG231; MANG491; MANG301	Demonstration	Semester-long team project	100% Met or Exceed	

Target for this sub-goal is at least 70% Meet or Exceed.

FA15 MANG471 Sample Size = 31
SP19 Sample Size = 9 teams (4 people per team)
SP20 Sample Size = 16 teams (3 – 5 students per team)

Narrative: After years of struggling with measuring the Teamwork SLO we finally were able to assess a demonstration of teamwork over the past two years. Much has been learned about the assessment process and outcomes. This Spring our assessment was limited due to the COVID-19 Pandemic. We were unable to observe teamwork on an in-person basis as we normally would, so it would be valuable to compare these results with the results of this SLO the next assessment cycle to determine how much COVID-19 impacted our ability to assess this SLO.

Of the 16 teams evaluated (made up of groups of students from 3-5), 100% of the teams evaluated met expectations. This was an extremely challenging semester for both students and faculty. Since our classes were completely online following the outbreak of the COVID-19 Pandemic, observing teamwork was particularly challenging. Moving forward, we will need to develop better ways to measure teamwork in a virtual environment.

The rubric used has five factors ranked 2, 1, 0. See the following breakdown of each factor:

- Team Role Identification = Mean (1.13) SD (.34)
- Contributions of Team Member = Mean (1.69) SD (.48)
- Maintains Constructive Team Climate = Mean (1.88) SD (.34)
- Team Communication = Mean (1.56) SD (.51)
- Conflict Resolution = Mean (1.25) SD (.45)

Next Assessment: SPRING 2022

Recommended actions: Continue to use new Teamwork rubric for assessment of behaviors during activity.

Close Loop Activities:

- The new approach incorporating observation along with pulling course embedded data (SLO 3.1) is working well and will continue to be refined during the next assessment cycle.

COLORADO MESA UNIVERSITY
DEPARTMENT OF BUSINESS

Assurance of Learning Report
AY20-21 – BBA, BAS, BS Degree Programs

Goal:	4. **Ethical Awareness and Societal Impact**		Current status
Objective:	4.1 – Analyze an issue within an ethical framework		
Semester:	Spring 2021	Date of this document: June 6, 2021	
Contacts:	Yen-Sheng Lee		

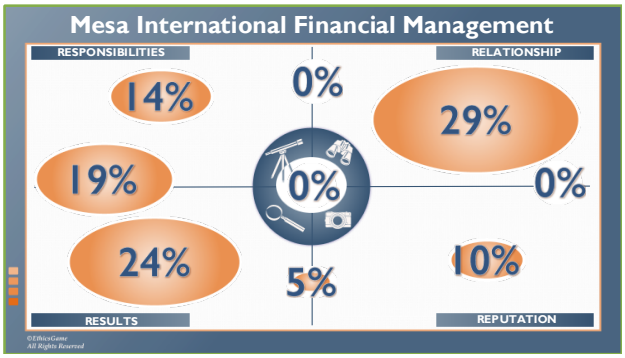
Last 3 assessments, oldest first

Semester	Course	Methods	Artifact	Results	Status
SP17	MANG201	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	MANG201	Direct	Case w/ Quiz	88% Met or Exceed	
SP17	MANG201	Direct	Case w/ Quiz	80% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
FA16	ACCT201	Direct	Case w/ Quiz	100% Met or Exceed	
FA16	ACCT201	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	HMGT470	Direct	Case w/ Quiz	100% Met or Exceed	
FA18	MANG301	Indirect + Direct	ELI w/ Simulation	94% Met or Exceed	
SP21	FINA431	Indirect + Direct	ELI w/ Simulation	90% Met or Exceed	

Narrative: Supported by the Daniels Fund Ethics Initiative all FINA431 classes had the opportunity to administer the Ethical Lens Inventory and an extensive Ethics simulation within their classes. The population sample was 23 students.

The '*ethical framework*" used to analyze an ethical dilemma was the Ethical Lens Inventory and associated instructional materials.

The Ethical Lens Inventory consists of 36 pairs of statements or words. Students will choose the most important statement or word, or how they would act in a specific ethics situation. The learning goals of the Ethical Lens Inventory are two folds; that is, to introduce students to the major ethical theories that are part of human experience, and to increase ethical awareness. Upon completion, students discover which of the four major ethical perspectives represents their preferred world view. In addition, students receive a five-page report of their ethical strengths and weaknesses.



The figure to the left shows the distribution over the four ethical lenses. 33% (14%+19%) of the students embrace or have a leaning toward a responsibility-based ethical worldview. 10% of the students have an ethical preference for the Reputation Lens, traditional virtue-based ethics. 24% prefer the Results Lens that correlates with consequentialism, and 29% select Relationship Lens that relate with Justice Theories, respectively. The remainder 5% falls on the edge between the Reputation Lens and the Results Lens.

Hot Topics Simulations are an immersive role play exercise where students work through a decision model to resolve two ethical dilemmas using all four of the ethical perspectives. Students have to comprehend ethical situations, scrutinize multiple options for ethical action, seek for the optimal route, and communicate the best solution to interested stakeholders.

The Hot Topics simulations have three features. The first is a five-step decision making model that is replicated in each simulation. Each simulation has an A dilemma, using the Responsibilities Lens (deontology) and the Results Lens (consequentialism) to resolve the dilemma and a B dilemma using the Relationship Lens (justice theories) and Reputation Lens (virtue ethics) to solve the problem. The pedagogical goal is to master the process through repetition. The second feature is that each simulation features two real-world ethical dilemmas. In this way, students experience ethical decision making in multiple contexts, enhancing their ethical awareness and decision-making skills. Finally, the simulations are scaffolded for differing levels of difficulty, thereby assuring that the role and complexity of the problem are appropriate. Mastering the decision process is crucial while getting the correct answer is not the goal of the simulation. The process includes identifying the ethical issue, stakeholders, and using the value priorities of all four ethical perspectives to resolve the dilemma.

The first simulation is called "Sagging Stock", the problem of which is that you run a large, publicly traded bio-technology firm. During a difficult period following the introduction of multiple competitive products to your company's "cash cow" product, your firm's earnings and share price fall. Wall Street analysts downgrade the outlook on your company, and you realize you need to boost near-term earnings

estimates for the coming quarter well beyond the current plan-of-record. Swift action is required, for you're about to have the quarterly conference call with investors and investment analysts. The issue of the "Sagging Stock" simulation is how to balance the interests of the company's investors in immediate earnings growth with the need of the company to follow a sound, realistic, and achievable business plan. About 90% of the students earned a B- or better in the "Sagging Stock" simulation.

Next Assessment: FALL 2023

Recommended actions: Dr. Lee may utilize Ethical Lens Inventory and Hot Topics Simulations in the future and enhance the percentages of students who can recommend an ethical solution. The aggregate data will allow him to compare the SLO of finance students over time and analyze the difference of SLO results between finance and management majors.

Close Loop Activities:

COLORADO MESA UNIVERSITY
DEPARTMENT OF BUSINESS

Assurance of Learning Report
AY20-21 – BBA, BAS, BS Degree Programs

Goal:	**4. Ethical Awareness and Societal Impact**		Current status
Objective:	4.2 - Recommend a solution based on an ethical framework		
Semester:	Fall 2018	Date of this document: June 6, 2021	
Contacts:	Kyle Stone, Christi Sanders		

Last 3 assessments, oldest first

Semester	Course	Methods	Artifact	Results	Status
SP17	MANG201	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	MANG201	Direct	Case w/ Quiz	88% Met or Exceed	
SP17	MANG201	Direct	Case w/ Quiz	80% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	CISB241	Direct	Case w/ Quiz	100% Met or Exceed	
FA16	ACCT201	Direct	Case w/ Quiz	100% Met or Exceed	
FA16	ACCT201	Direct	Case w/ Quiz	100% Met or Exceed	
SP17	HMGT470	Direct	Case w/ Quiz	100% Met or Exceed	
FA18	MANG301	Indirect + Direct	ELI w/ Simulation	76% Met or Exceed	
SP21	FINA432	Indirect + Direct	ELI w/ Simulation	76% Met or Exceed	

Narrative: The Ethical Lens Inventory consists of 36 pairs of statements or words. Students will choose the most important statement or word, or how they would act in a specific ethics situation. The learning goals of the Ethical Lens Inventory are two folds; that is, to introduce students to the major ethical theories that are part of human experience, and to increase ethical awareness. Upon completion, students discover which of the four major ethical perspectives represents their preferred world view. In addition, students receive a five-page report of their ethical strengths and weaknesses.

Hot Topics Simulations are an immersive role play exercise where students work through a decision model to resolve two ethical dilemmas using all four of the ethical perspectives. Students have to comprehend ethical situations, scrutinize multiple options for ethical action, seek for the optimal route, and communicate the best solution to interested stakeholders.

The Hot Topics simulations have three features. The first is a five-step decision making model that is replicated in each simulation. Each simulation has an A dilemma, using the Responsibilities Lens (deontology) and the Results Lens (consequentialism) to resolve the dilemma and a B dilemma using the Relationship Lens (justice theories) and Reputation Lens (virtue ethics) to solve the problem. The pedagogical goal is to master the process through repetition. The second feature is that each simulation features two real-world ethical dilemmas. In this way, students experience ethical decision making in multiple contexts, enhancing their ethical awareness and decision-making skills. Finally, the simulations are scaffolded for differing levels of difficulty, thereby assuring that the role and complexity of the problem are appropriate. Mastering the decision process is crucial while getting the correct answer is not the goal of the simulation. The process includes identifying the ethical issue, stakeholders, and using the value priorities of all four ethical perspectives to resolve the dilemma.

The second simulation is called "Clever Pitch", the problem of which is that you're putting together a proposal for funding from a key venture capital firm. If successful, you'll raise $32 million to complete testing and market a promising new product. You have data and projections to paint an enticing picture for potential investors. However, you're aware of potential problems with the research results. You're also aware that the sales projections include off-label sales, although your sales team can't directly promote off-label use of prescription drugs. The issue of the "Clever Pitch" simulation is whether to include all the information you have in the proposal to the venture capitalists. About 62% of the students earned a B- or better in the "Clever Pitch" simulation. On average, 76% of the students earned a B- or better in both simulations.

Next Assessment: SP2023

Recommended actions: Dr. Lee may utilize Ethical Lens Inventory and Hot Topics Simulations in the future and enhance the percentages of students who can recommend an ethical solution. The aggregate data will allow him to compare the SLO of finance students over time and analyze the difference of SLO results between finance and management majors.

Close Loop Activities:

Goal:	4. **Ethical Awareness and Societal Impact**	Current status
Objective:	4.3 – Engage in a local, regional, national, and/or international activity that positively impacts society.	
Semester: Fall 2021	Date of this document: June 6, 2021	
Contacts: Christi Sanders Via		

Last 3 assessments, oldest first

Semester	Course	Methods	Artifact	Results	Status

Narrative: This is a new SLO the DSB has adopted in response to the AACSB Standard Nine requirements. We developed a survey instrument to capture data about activities that DSB faculty and students are already participating in to help us determine what method we will use to evaluate this SLO.

Next Assessment: FA2021
Recommended actions: Develop and deploy assessment method.
Close Loop Activities:

Appendix F - Program Outcome and Assessment Plan Template

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
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.
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.
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.
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.
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.
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.

External Review
CISB
Colorado Mesa University
Submitted March 25, 2022
Paul M. Leidig, Ph.D.
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I visited the Colorado Mesa University campus in Grand Junction February 27-28, 2022 to review the Computer Information Systems (CISB) program. The visit began Sunday with Dr. Johnny Snyder who provided a tour of the city and campus, followed by dinner with Business Department Head Christine Noel and Assistant Vice President for Academic Affairs Chad Middleton. A full day of meetings on Monday included; President John Marshall, Vice President for Academic Affairs Kurt Haas, VP for Information Technology Jeremy Brown, Library Director Sylvia Real and the Business Liaison Laureen Cantwell, and Business Assessment Chair Christie Sanders. The visit included meeting with a group of students in the CISB 342 class and lunch with several CISB alumni. Prior to the visit I was provided a program review self-study and CISB course schedules for the current semester.

The CISB faculty offer BS and BAS degrees in computer information systems, BBA in business analytics, minors in CISB and a minor in cybersecurity jointly administered with the computer science faculty. A certificate in decision support systems is designed for working professionals. CISB faculty also support all BBA students with information systems courses.

Mission, Objectives and Learning Objectives

The CISB program has appropriate student outcomes and its program mission and vision statements are consistent with the university's mission. The CISB program supports the mission of CMU by providing professional and career-oriented degrees. CISB faculty focus on student success, quality teaching, and research threads germane to the discipline.

The goals for the CISB program include:

- continuation of the delivery of a quality information systems program adhering to national curriculum standards
- continuation of faculty scholarship germane to the discipline
- continuation of the support of student success
- having the ability to adapt and pivot according to curriculum or environmental changes.

  Recommendation: Publish student outcomes (measurable results) and program objectives on the program's website. This publicly informs current students, prospective students and other stakeholders of the desired and delivered outcomes of the program.

Student Feedback

I met with students enrolled in Dr. Snyder's CISB 342 class, and with recent CISB alumni. Overall, the students value and appreciate the mentorship provided by Dr. Snyder throughout the program. They also appreciate small classes, the informal and supportive nature in the tutoring and high standards exhibited by faculty.

Students were very complimentary of the experience provided in two courses; CISB 341 - Quantitative Decision Making and CISB 471 - Advanced Information Systems. CISB 341 was identified as the best (most beneficial) course in the program, and the capstone experience was instrumental in instilling confidence in student abilities. Based on my familiarity with many information systems programs, CISB 341 is somewhat unique and a strength of the program.

Students would like to see more diversity provided by additional faculty. While admiration of the instruction and mentoring of Dr. Snyder was a common theme, an equal sentiment was the desire for multiple viewpoints and experiences missing from a lack of full-time CISB faculty.

Other observations provided by students included:

- Too much dependency on software platforms (Cengage, Pearson) in courses like CISB 205 and 306. Claims of adjuncts relying on the learning software systems to substitute for instruction by faculty.
- Some instructors just present another instructor's material without contributing to the course.
- Students wish that more programming languages were covered (Python etc.)
- Students wish they could integrate CS and CIS programming courses more often.
- Wish they had a more hands-on instruction from faculty.
- Would like to meet with administration for a two-way dialog about the program.

CISB program alumni also complimented the capstone project as a beneficial experience, realizing how valuable it was 5 years removed from the program. They also provided suggestions for improving the program, including:

- A desire for an "internship" type experience
- Provide more programming, specifically scripting languages like Powershell - Help students see how it all fits together

Recommendation: Consider adding an internship requirement to the CISB curriculum. Also, provide more instruction support and training to help adjuncts deliver direct faculty knowledge instead of relying on software instruction. Enhance the programming languages offerings for students.

Curriculum

Computing is an evolving field and the curriculum continues to evolve as well. The CISB faculty effectively compare CMU's curriculum with national standards, continually making adjustments

when necessary to align with model curricula, and assessing student outcomes via industry normed examinations. It is the observation of this reviewer that the courses offered in CISB majors are in line with similar peers and accepted model curriculum, and the quality of the program matches the overall academic standards of the university.

Students appreciate joint ventures with other academic units, such as the cybersecurity program offered jointly with computer science. This would help the CISB program offer programs desired by students for which the business faculty lack expertise. In addition, adding more evolving programs such as the business analytics major, would help expand interest in CISB offerings.

Recommendation:

- Consider aligning the curriculum with IS2020, the latest model information systems curriculum, and assess whether the curriculum matches ABET accreditation criteria.
- Add industry-based experiential learning and internships.

Facilities

The CMU campus is attractive with excellent overall facilities. The Davis School of Business is housed in the second and third floors of Dominguez Hall (DH). In DH there are four computer classrooms used for instruction of CIS classes. Classrooms are modern and computer labs support courses, student tutoring and workspace. Any specialty software is housed in DH 303 where students can be granted key-card access for team and/or individual projects. Students have an opportunity to use the Computer Heroes lab and provide direct customer service in an experiential learning environment. This is a benefit to students in the program. All CIS faculty have private office space in DH as well as a computer along with network and printing support.

The Tomlinson Library is a heavily used resource and provides both hard copies of journals and books, as well as subscriptions to multiple databases in support of the academic mission. The 24-hour open access room is an appreciated aspect of the library.

Recommendation: Given the applied industry focused approach of most CISB courses, I suggest evaluating the addition of Safari online books with O'Reilly technical support materials.

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.

Faculty

Currently, all CISB courses are covered primarily with 11 adjuncts or borrowed faculty from other disciplines and one single full-time faculty member dedicated to the CISB program. The sole full-time instructor has an appropriate terminal degree for the discipline. In recent years,

there have been four dedicated full-time CISB faculty. At the time of this campus visit, the Business School was in the process of trying to hire two full-time faculty in CISB and Business Analytics. CISB right now is a one-man faculty shop. It is amazing that CMU can offer the current number of course sections and variety of programs, delivered primarily with adjunct staffing.

If CMU is successful filling the two posted positions, the situation will be improved, but will still be below peers in full-time to adjunct ratio. Challenges remain regarding adequate faculty needed to deliver a quality program:

- Diversity in backgrounds, expertise and quality of faculty
- Based on the advertised open positions, faculty salaries are well below national norms. While these salaries may be in line with local (CMU) salaries, and regional cost of living, the posted salaries are not attractive when viewed from a national competitive perspective. This may pose a threat to recruiting and retaining qualified faculty.
- Faculty normally teach four courses per semester which often includes three unique preparations. Concerns about the teaching load of faculty may also pose a challenge to recruiting and retaining qualified faculty.
- While the faculty are currently taking part in scholarship, this appears due to the interest and commitment of the current professor. Newly hired faculty may not be able to take part in scholarship and research with the existing teaching load expectations.

  Observation: This faculty concern is an issue remaining from the 2014 external review, and the situation is more dire than it was in 2014:

- CISB 210 is still staffed with adjuncts, therefore missing an opportunity to draw students into the CIS major with an engaging and consistent presentation of information systems to students often looking to determine their future career.
- The entire CIS program is managed on the back of one primary faculty (Johnny Snyder) who teaches an overload of 5 courses, serves as the program director, mentor and advisor etc. with no teaching load reduction for these activities.

A strength of the faculty was recognized for student-faculty engagement in leading extracurricular opportunities such as programming competitions and other showcases organized by great mentoring from the faculty.

Recommendation: It is imperative that CMU be successful hiring additional tenure-track faculty to adequately serve the existing curricular needs of the CISB program, and allow for program growth. It is my assessment that filling the two open positions only makes progress in closing the faculty gap, but does not completely get the program to where it should be. Also, while the self-study uses full-time equivalent faculty (FTEF) numbers to address faculty coverage, FTEF made up primarily with adjunct faculty is not the same thing as having dedicated qualified faculty leading the program. This issue is the primary threat to a sustainable quality program. Reducing teaching loads and improving salaries could be necessary to improve this situation.

Assessment (Continuous Improvement)

The department uses direct and indirect measurements of SLO's. The CISB faculty decided to follow established model curriculum guidelines since 2003, and measure outcomes against a nationally normed exam which reports aggregate as well as disaggregated data of CMU students by ICCP's ISA exam. This exam measures course-level SLOs as well as program level SLOs in an information systems program. CMU CISB students have consistently performed well on this benchmark.

CMU's CISB curriculum follows accepted curriculum models (IS 2002, IS 2010, and CC 2020). There is evidence of recent and ongoing changes to keep curriculum current with national standards.

Recommendation:

- Consider measuring the program against the latest model curriculum IS2020.
- Create a more robust documentation system that helps track articulated recommended actions, in process, or completed status.

Summary

The CMU CISB program has many strengths. This conclusion summarizes key observations and high priority recommendations.

Key Observations and Program Strengths

- Students identify the capstone experience as valuable and a strength of the program.
- Students report faculty are student-centered, support experiential opportunities and enforce high expectations.
- The curriculum of the CISB program is in general compliance with national standards.
- The assessment process is enhanced with the use of industry normed exams matched to learning units of model curriculum. This is a highly validated benchmark in the continuous improvement process.
- The CMU campus is attractive with excellent modern facilities.

Highest Priority Recommendations

- The highest priority for the CISB program should be the addition of tenure-track faculty, in addition to the two open positions.
- Decrease the teaching load of CISB faculty and work on improving salaries to improve hiring and retaining faculty
- Consider adding an internship requirement to the CISB curriculum.
- Enhance the programming languages offerings for students

Additional Recommendations

- Provide more original faculty instruction instead of relying on software instruction for foundational courses. This could improve with the addition of full-time faculty.
- Consider aligning the curriculum with IS2020, the latest information systems model curriculum, and assess whether the curriculum matches ABET accreditation criteria.
- Given the applied industry focused approach of most CISB courses, I suggest evaluating the addition of Safari online books with O'Reilly technical support materials.
- Publish student outcomes (measurable results) and program objectives on the program's website. This publicly informs current students, prospective students and other stakeholders of the desired and delivered outcomes of the program.

Potential Opportunities:

It is the assessment of this reviewer that CMU is missing unmet demand for technical talent in the Grand Valley. The technical skills needed for an expanding IT industry indicates an opportunity to appeal to a large population of students who have not considered a baccalaureate degree. Enrollment opportunities might be found via several opportunities, including:

- Expanding program opportunities via additional emphases, minors, or certificates in high-demand areas.
- Expand delivery modalities, to include:
  - offering short, articulated programs for adult learners and degree completion
  - packaging existing programs into stackable micro-credentials, certificates, or digital badges.

Executive Summary of External Reviewer's Observations

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 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			While the program's resources are currently stretched to meet enrollment, it appears there is unmet demand for the geographic footprint of CMU.
The program's teaching-learning environment fosters success of the program's students.		X			The existing faculty (currently only one FTE) provide an excellent learning environment. However, existing faculty are not adequate to foster success of the program's students.
Program faculty members are appropriately credentialed.	X				
Program faculty members actively contribute to scholarship, service and advising.	X				Program faculty could be contributing more in scholarship with a more balanced workload.
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				While the program faculty are involved in ongoing assessment activities, the process would be improved with a better articulated

					documentation system to foster continuous improvement.
The program's articulation of its strengths and challenges is accurate/ appropriate and integral to its future planning.	X				