

2011-2012 Assessment Report for CIS AAS Degree Outcomes

Submitted: June 22, 2012
SAC: Computer Information Systems
Outcomes Assessed: CIS AAS
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1. Describe changes to teaching practices implemented as a result of learning outcome assessments that were carried out in the previous academic year.

These changes have been implemented to courses based on the recommendations in the 2010-2011 report. All three courses that were assessed last year implemented changes that were listed in the previous report.

CIS 275 Database Design and Introduction to SQL

These changes were suggested in the previous report and implemented in the CIS 275 Database class.

1. A lesson on SQL standards was added to the course material.
2. An ER-diagram was added to the assignment using normalization.

CIS 179 Data Communication Concepts I

These changes were suggested in the previous report and implemented in the CIS 179 course.

1. Additional examples of roll playing were added to the assignments.

CIS 140M Operating Systems I: Microsoft

These changes were suggested in the previous report and implemented in the CIS140M course.

1. More time was spent having students do hands-on fixes to system problems.

2. Identify the outcomes assessed this year and describe the methods used.

In the previous report, five outcomes were assessed. This year all 12 outcomes were assessed. The table shows a mapping of the outcome to the course it is assessed in, as well as the type of assessment used in each course.

Degree Outcome Categories	Degree Outcomes	Class used for assessment	Type of assessment
	Apply computer technology to address business information system needs.	275	Lab assignments
Process	Develop and evaluate system requirements.	244	Lab/Paper
	Design, implement and deploy systems.	179	Lab assignments
	Evaluate, test, debug and troubleshoot systems.	140M	Lab assignments
Technology	Create effective databases and user interfaces.	275	Lab assignments
	Develop small programs.	233J	Lab assignments/ Exam
	Use network concepts and terminology to communicate with vendors and users.	179	Lab assignments
	Select appropriate technology tools by recognizing tool capabilities and limitations.	244	Lab assignments
Information Systems in Business	Apply operational business knowledge in addressing information systems needs.	244	Lab/Paper
Personal and Interpersonal	Communicate effectively in both oral and written form.	244	Lab/Paper
	Work effectively in teams.	244	Lab/Paper
	Manage time, tasks and projects	244	Lab/Paper

Design of the assessment methods

Two degree outcomes were assessed in the same course using the rubric shown below. A database course was used. The student sample size consisted of all students in the course who had submitted the assignment.

Degree outcome: *Create effective databases and user interfaces.*

This outcome was assessed on the ability of the students to understand the business needs of the customer and design a correct solution. On the rubric, the first 6 criteria apply to this outcome. They consist of performing a requirements analysis and designing a database that will deliver all the functionality requested.

A desirable outcome would be 4 points showing that a student could gather information and use it to create a correct design. This design would be used to create the database.

Degree outcome: *Apply computer technology to address business information system needs.*

This outcome was assessed by using the last 3 criteria in the rubric. These determine whether a student can correctly create or implement the database, based on the analysis and design.

A desirable outcome would be 4 points which would show that a student could correctly use the technology to create the database.

Criteria	1 point	2 points	3 points	4 points
Requirements Analysis	Data elements and entity classes not identified.	Some entities and attributes are identified.	Entities and attributes determined but business rules incomplete.	Has gathered enough information to begin design phase.
ER Design - Entities	Entities were not drawn or do not fulfill any requirements.	A few entities were drawn, but there are major problems with missing entities, non-existent entities, etc.	Most entities are present, but minor errors exist such as one entity being missing.	All entities are present with no unnecessary entities.
ER Design - Attributes	Attributes are missing or are not correct.	A few attributes are present, but most are missing, difficult to identify or misplaced.	Most attributes are present, but minor error(s) exist such as an attribute being misplaced.	All attributes are present and placed in the correct entities
ER Design - Relationships	Relationships are not drawn or are not drawn	A few relationship lines are drawn, but	Most relationship lines are drawn, but	All relationship lines are present and they connect

	correctly between entities	many are missing, or drawn between incorrect entities.	there are minor error(s) such as one missing line or one line drawn between the wrong entities.	the correct entities in a efficient manor given user requirements.
ER Design - Cardinality	Cardinalities are not present or are mostly incorrect.	A few cardinalities are correct, but many are invalid or missing.	Most cardinalities are correct, but minor error(s) exist such as one cardinality being one-to-many that should be one-to-one.	All cardinality are present and correct.
Normalization	None performed	Relations meet the requirements of first normal form. (entities are relations)	Functional dependencies identified. Normalized to 3NF.	Functional and multivalue dependencies identified. Normalized to 3NF & 4NF
Analysis of request	Doesn't read or hear question as shown by incorrect or missing list of items to be projected by query.	Knows what needs to be projected but conditions are not met. Little knowledge of database.	Translates request into basic query.	Questions were asked, requirements understood, and resulting query fulfilled users need.
SQL Syntax and Standards	SQL is poorly written and does not follow class syntax rules or standards.	SQL is somewhat correctly written, but has major flaws in class syntax rules and/or standards.	SQL mostly follows class syntax rules and standards with only minor error(s).	SQL follows class syntax rules and standards.
SQL Functionality	SQL does not execute and has serious errors.	SQL does not execute and has some major errors or executes but does not return requested data.	SQL executes with minor error(s) and returns mostly correct data.	SQL executes without error(s) and returns requested data.
SQL Efficiency	SQL is written with major efficiency problems.	SQL is written with a limited number of efficiency problems.	SQL is written with a few minor efficiency problems.	SQL is written in an efficient manor.

Six degree outcomes were assessed in the same course using the rubric shown below. A system analysis and design course was used. The course term project was used for the assessment. The project involved working on teams, a written report and an oral presentation. The student sample size consisted of all students in the course who had submitted the assignment.

Degree outcome: *Develop and evaluate system requirements.*

A desirable result would be a Strong (4) which would show that a student had a thorough understanding of the requirements of the system to be developed.

Degree outcome: *Select appropriate technology tools by recognizing tool capabilities and limitations.*

A desirable result would be a Strong (4) to show that a student understood the technological tools available to deliver the solution.

Degree outcome: *Apply operational business knowledge in addressing information systems needs.*

A desirable result would be a Strong (4) showing that a student understood business information systems.

Degree outcome: *Communicate effectively in both oral and written form.*

A desirable result would be a Strong (4) showing that a student could write a good report and communicate effectively.

Degree outcome: *Work effectively in teams.*

A desirable result would be a Strong (4) showing that a student could effectively work in teams.

Degree outcome: *Manage time, tasks and projects*

A desirable result would be a Strong (4) showing that a student could complete all the projects on time.

Outcome	Strong (4 pts)	Acceptable (3 pts)	Unacceptable (2 pts)	Weak (1 Pt)
Develop and evaluate system requirements.	Shows a thorough understanding of the business and IT needs	Shows an adequate understanding of the business and IT needs	Misses some very key points about the business and IT needs	Completely misunderstands the business and IT needs
Select appropriate technology tools by recognizing	Has a strong knowledge of the technological tools that are available	Has an adequate knowledge of the technological tools that are	Has a weak knowledge of the technological tools that are	Has little to no knowledge of the technological tools that are available or

tool capabilities and limitations.	and can present clear arguments on the pros and cons of the tools in the current system	available and can present some of the pros and cons of the tools in the current system	available or an present only one or two pros and cons of the tools in the current system	can present no arguments on the pros and cons of the tools in the current system
Apply operational business knowledge in addressing information systems needs.	Thoroughly understands how a business operates and applies that knowledge to the business's information systems	Adequately understands how a business operates and applies that knowledge to the business's information systems	Misunderstand one or two common business practices or is unable to apply that knowledge to the business's information systems	Doesn't understand common business practices or is unable to apply that knowledge to the business's information systems
Communicate effectively in oral form	Presentation to the class is well prepared and presented.	Presentation is generally well organized with a good set of slides that cover the main points; the presentation is generally effective with minimal distractions	Presentation is boring although it does cover most of the major topics. Delivery causes audience to be distracted	Organization is very poor with no logical thread tying it together. Slides and/or delivery are inconsistent
Communicate effectively in written form.	Writing is professional, well organized, logical with no spelling or grammar mistakes	Most ideas are well organized, the key points are presented, but the treatment is not thorough. However, there are no grammar or spelling mistakes	Some ideas are well organized, while others lack organization or there are many grammar or spelling mistakes	Writing is disorganized and unprofessional with many spelling or grammar mistakes
Work effectively in teams.	Greatly contributes to the success of the team. The team itself works well together	Somewhat contributes to the success of the team or the team has a few minor problems	Works independently from the team or the team has major disagreements	Doesn't contribute to the success of the team or the team is completely dysfunctional
Manage time, tasks and projects.	All projects are turned in on time. Projects are thoroughly done	Most projects are turned in on time. Projects are done well.	Few projects are turned in on time or the work that is done is missing vital steps	No projects are turned in on time or the work that is done is extremely incomplete

Degree outcome: *Develop small programs*

This outcome was assessed in a second term programming course using the rubric below. The student sample size consisted of all students in the course who had submitted the assignment.

The desirable outcome would be Strong (4) which would demonstrate that a student could write, test and document a program correctly and completely. A Poor (1) outcome would indicate major errors or omissions with the coding of the program or absence of testing and documentation.

Points	Strong (4)	Acceptable (3)	Unacceptable (2)	Poor (1)
Develop small programs	Code is correct and complete	Code is correct and complete	There is one major error or omission with the program code.	There are major omissions and errors in coding
	Testing is complete	Testing is incomplete	Testing is complete	Testing was not performed
	Documentation is complete	Documentation is incomplete	Documentation is complete	Documentation is missing

Two degree outcomes were assessed in the same course using the rubric shown below. A networking concepts course was used. The student sample size consisted of all students in the course who had submitted the assignment.

Degree outcome: *Design, implement and deploy systems.*

A desirable score would be 5 points which would show that a student understood all the system scenarios and data flows through the system.

Degree outcome: *Use network concepts and terminology to communicate with vendors and users.*

A desirable score of 5 points would show that the student understood network concepts and could use them effectively in communication.

	1 point	2 points	3 points	4 points	5 points
Outcome: Use network concepts and terminology to communicate with vendors and users	Unable to use network concepts adequately to find relevant sources	Uses some concepts accurately but unable to find relevant news sources	Uses concepts and applies them accurately, but unable to find relevant news sources	Uses concepts, applies them accurately and finds limited value news sources Limited ability to communicate results	Uses concepts, applies them to find relevant news sources and interprets the results accurately in a clear manner
Outcome: Design, implement and deploy systems	Unable to follow system definition	Limited ability to understand what is happening in the system	Understands the first scenario of the system and can follow the data flow	Understands most system scenarios and follows data flow with few errors	Understands all system scenarios and follows the data flow with no errors

3. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?

The results of the assessment for each outcome are shown below.

Degree outcome: *Apply computer technology to address business information system needs.*

Results

This outcome was measured in CIS275.

The data shows that slightly more than 65% of the students scored 4 points (on a scale of 1-4) meaning they could correctly apply database technology to implement the database. Their implementation had no errors and executed correctly. It returned the correct data.

Slightly more than 23% had minor errors in the implementation. Most of the data returned was correct.

Slightly more than 5% had major errors in the implementation. Data returned was not correct and the implementation did not execute correctly.

Slightly more than 5% had a non-working implementation. No data was correctly returned.

Degree outcome: *Develop and evaluate system requirements.*

Results

This outcome was measured in CIS244. On a scale of 1 to 4, the average score was 3.6. According to the rubric, students show an adequate or thorough understanding of business and IT needs.

Degree outcome: *Design, implement and deploy systems.*

Results

This was measured in CIS179.

According to the rubric, 50% of the students scored in the Strong category indicating that they understood all system scenarios and could follow the data flow with no errors. Almost 18% scored in the good category; slightly over 10% scored in the acceptable category.

Strong	Good	Acceptable	Unacceptable	Poor
50.0%	17.9%	10.7	7.1	14.3

Degree outcome: *Evaluate, test, debug and troubleshoot systems.*

Results

This outcome was measured in CIS140M . Over 82% of the students met the outcome. Students were evaluated in four areas: gather system performance data, process and evaluate the data, determine system bottlenecks, and make necessary system adjustments.

Degree outcome: *Create effective databases and user interfaces.*

Results

This outcome was measured in CIS275.

The data shows that slightly more than 65% of the students scored 4 points (on a scale of 1-4) meaning they could correctly understand user requirements and design the database correctly. All entities, attributes and relationships were identified. The database was normalized.

Slightly more than 23% had minor errors or omissions in the requirements, entities, attributes or relationships.

Slightly more than 5% had major errors or omissions in the requirements, entities, attributes or relationships.

Slightly more than 5% had no requirements, entities, attributes or relationships.

Degree outcome: *Develop small programs.*

Results

This outcome was measured in CIS233J. A programming assignment was used for the assessment of the ability of a student to develop a small program. Development included not only the coding but also testing and documentation.

The sample size consisted of the entire roster of the section of students who were actively participating in the course at that point. The assignment was given near the end of the term.

Nearly 71% scored in the Strong (4) range, meaning according to the rubric they could correctly and completely code, test and document small programs.

Nearly 13% scored in the Acceptable (3) range, meaning the code was correct and complete but there was a minor omission such as incomplete documentation.

About 6.5% scored in the Unacceptable (2) range, meaning there was one major error or omission in the code.

Almost 10% scored in the Poor (1) range, meaning there were major omissions and errors in the code, no testing and no documentation.

Points	Strong (4)	Acceptable (3)	Unacceptable (2)	Poor (1)	Total
	Code is correct and complete	Code is correct and complete	There is one major error or omission with the program code.	There are major omissions and errors in coding	
	Testing is complete	Testing is incomplete	Testing is complete	Testing was not performed	
	Documentation is complete	Documentation is incomplete	Documentation is complete	Documentation is missing	
Occurrences	22	4	2	3	31
Percent	70.97%	12.90%	6.45%	9.68%	

Degree outcome: *Use network concepts and terminology to communicate with vendors and users.*

This was measured in CIS179.

According to the rubric, 32% of the students performed in the Strong range and used concepts and applied them accurately.

Strong	Good	Acceptable	Unacceptable	Poor
32.1%	25.0%	3.6%	14.3%	25.0%

Degree outcome: *Select appropriate technology tools by recognizing tool capabilities and limitations.*

Results

This outcome was measured in CIS244. On a scale of 1 to 4, the average score was 3.6. According to the rubric, the student has an adequate or better knowledge of the technological tools that are available and can present some of the pros and cons of the tools in the current system.

Degree outcome: *Apply operational business knowledge in addressing information systems needs.*

This was measured in CIS244. On a scale of 1 to 4, the average score was 3.5. According to the rubric, the student adequately or better understands how a business operates and applies that knowledge to the business's information system.

Degree outcome: *Communicate effectively in both oral and written form.*

Results

This outcome was measured in CIS244. On a scale of 1 to 4, the average score for oral communication was 3.4 while it was 3.2 for written. According to the rubric, for the oral communication, the student presentation was between well prepared and generally well organized, with a good set of slides that covered the main points.

On a scale of 1 to 4, the average score for written communication was 3.2. The writing had most ideas

well organized and the key points were presented, but some of the treatment was not thorough. There were no grammar or spelling mistakes.

Degree outcome: *Work effectively in teams.*

Results

This outcome was measured in CIS244. On a scale of 1 to 4, the average score was 3.4. According to the rubric, the students either somewhat contributed to the success of the team or greatly contributed to its success. The team may have a few minor problems or work well together.

Degree outcome: *Manage time, tasks and projects*

Results

This outcome was measured in CIS244. On a scale of 1 to 4, the average score was 3.4. According to the rubric, the student managed most or all projects turned in on time. The projects were done well to thoroughly.

4. Identify any changes that should, as a result of this assessment, be implemented towards improving students' attainment of degree and certificate outcomes.

The following changes to teaching and learning and to the assessment strategies have been identified and should be implemented during the next year.

Changes to improve teaching and learning

CIS233J

The results show that students could do better in the testing and documentation of the software programs. More material should be provided for testing and documentation.

CIS244

There is a slight difference between student performance on the oral and written reports. More help should be provided on the written reports to get it to at least the level of the oral reports.

5. Changes to the assessment strategies

The CIS275 rubric should be split into two sections which clearly map the outcomes with how they are assessed in the class. There should be separate scores for each outcome. As it is, the scores for 2 outcomes are grouped. This makes it impossible to assess each outcome independently.

Rubrics

CIS244 Rubric

	Strong (4 pts)	Acceptable (3 pts)	Unacceptable (2 pts)	Weak (1 Pt)
Develop and evaluate system requirements.	Shows a thorough understanding of the business and IT needs	Shows an adequate understanding of the business and IT needs	Misses some very key points about the business and IT needs	Completely misunderstands the business and IT needs
Select appropriate technology tools by recognizing tool capabilities and limitations.	Has a strong knowledge of the technological tools that are available and can present clear arguments on the pros and cons of the tools in the current system	Has an adequate knowledge of the technological tools that are available and can present some of the pros and cons of the tools in the current system	Has a weak knowledge of the technological tools that are available or can present only one or two pros and cons of the tools in the current system	Has little to no knowledge of the technological tools that are available or can present no arguments on the pros and cons of the tools in the current system
Apply operational business knowledge in addressing information systems needs.	Thoroughly understands how a business operates and applies that knowledge to the business's information systems	Adequately understands how a business operates and applies that knowledge to the business's information systems	Misunderstand one or two common business practices or is unable to apply that knowledge to the business's information systems	Doesn't understand common business practices or is unable to apply that knowledge to the business's information systems
Communicate effectively in oral form	Presentation to the class is well prepared and presented.	Presentation is generally well organized with a good set of slides that cover the main points; the presentation is generally effective with minimal distractions	Presentation is boring although it does cover most of the major topics. Delivery causes audience to be distracted	Organization is very poor with no logical thread tying it together. Slides and/or delivery are inconsistent
Communicate effectively in written form.	Writing is professional, well organized, logical with no spelling or	Most ideas are well organized, the key points are presented, but the treatment	Some ideas are well organized, while others lack organization or there are many	Writing is disorganized and unprofessional with many spelling or

	grammar mistakes	is not thorough. However, there are no grammar or spelling mistakes	grammar or spelling mistakes	grammar mistakes
Work effectively in teams.	Greatly contributes to the success of the team. The team itself works well together	Somewhat contributes to the success of the team or the team has a few minor problems	Works independently from the team or the team has major disagreements	Doesn't contribute to the success of the team or the team is completely dysfunctional
Manage time, tasks and projects.	All projects are turned in on time. Projects are thoroughly done	Most projects are turned in on time. Projects are done well.	Few projects are turned in on time or the work that is done is missing vital steps	No projects are turned in on time or the work that is done is extremely incomplete

CIS140M Rubric

Outcome: Evaluate, test, debug & troubleshoot systems	1pt	2pt	3pt	4pt	5pts
Evaluate - (Deliverable 1) Gathering system performance data	Student is able to gather data for 2 or fewer counters outlined in the assignment	Student is able to gather data for 3 - 4 counters outlined in the assignment	Student is able to gather data for 5 counters outlined in the assignment	Student is able to gather data for 6 counters outlined in the assignment	Student is able to gather data on all 7 counters outlined in the assignment
Evaluate - (Deliverable 2) Processing & evaluating the gathered data	Student is unable to provide the recommended values for any of the counters outlined in the assignment	Student provided invalid recommended values for 4 or more counters outlined in the assignment	Student provided 5 recommended values for the counters outlined in the assignment	Student provided 6 recommended values for the counters outlined in the assignment	Student provided 7 recommended values for the counters outlined in the assignment
Debug - (Deliverable	Student is unable	Student was able compare	Student was able compare	Student was able compare	Student was able compare

3) Determining system bottlenecks (troubleshooting)	compare and contrast the gathered data with recommended data	and contrast the gathered data with recommended data for 3 to 4 counters outlined in the assignment	and contrast the gathered data with recommended data for 5 counters outlined in the assignment	and contrast the gathered data with recommended data for 6 counters outlined in the assignment	and contrast the gathered data with recommended data for 7 counters outlined in the assignment
Test & Troubleshoot - (Deliverable 4) Making the necessary system adjustments (reducing bottlenecks).	Student is unable to provide any interpretation and/or draw the necessary conclusions on what systems need to be upgraded (if any)	Student interpretation /conclusions are incorrect based on information provided in the assignment	Student is able to interpret the data and draw the necessary conclusions on what systems need to be upgraded (if any) and support the conclusion, two or more upgrade opportunity missed	Student is able to provide interpret the data and draw the necessary conclusions on what systems need to be upgraded (if any) and support the conclusion, one upgrade opportunity missed	Student is able to provide interpret the data and draw the necessary conclusions on what systems need to be upgraded (if any) and support the conclusion, non upgrade opportunity missed

CIS275 Rubric

CIS 275				
Criteria	1 point	2 points	3 points	4 points
Requirements Analysis	Data elements and entity classes not identified.	Some entities and attributes are identified.	Entities and attributes determined but business rules incomplete.	Has gathered enough information to begin design phase.
ER Design - Entities	Entities were not drawn or do not fulfill any requirements.	A few entities were drawn, but there are major problems with missing entities, non-existent entities, etc.	Most entities are present, but minor errors exist such as one entity being missing.	All entities are present with no unnecessary entities.
ER Design -	Attributes are	A few attributes	Most attributes	All attributes are

Attributes	missing or are not correct.	are present, but most are missing, difficult to identify or misplaced.	are present, but minor error(s) exist such as an attribute being misplaced.	present and placed in the correct entities
ER Design - Relationships	Relationships are not drawn or are not drawn correctly between entities	A few relationship lines are drawn, but many are missing, or drawn between incorrect entities.	Most relationship lines are drawn, but there are minor error(s) such as one missing line or one line drawn between the wrong entities.	All relationship lines are present and they connect the correct entities in a efficient manor given user requirements.
ER Design - Cardinality	Cardinalities are not present or are mostly incorrect.	A few cardinality are correct, but many are invalid or missing.	Most cardinalities are correct, but minor error(s) exist such as one cardinality being one-to-many that should be one-to-one.	All cardinality are present and correct.
Normalization	None performed	Relations meet the requirements of first normal form. (entities are relations)	Functional dependencies identified. Normalized to 3NF.	Functional and multivalue dependencies identified. Normalized to 3NF & 4NF
Analysis of request	Doesn't read or hear question as shown by incorrect or missing list of items to be projected by query.	Knows what needs to be projected but conditions are not met. Little knowledge of database.	Translates request into basic query.	Questions were asked, requirements understood, and resulting query fulfilled users need.
SQL Syntax and Standards	SQL is poorly written and does not follow class syntax rules or standards.	SQL is somewhat correctly written, but has major flaws in class syntax rules and/or standards.	SQL mostly follows class syntax rules and standards with only minor error(s).	SQL follows class syntax rules and standards.
SQL Functionality	SQL does not execute and has serious errors.	SQL does not execute and has some major errors or	SQL executes with minor error(s) and returns mostly	SQL executes without error(s) and returns requested data.

		executes but does not return requested data.	correct data.	
SQL Efficiency	SQL is written with major efficiency problems.	SQL is written with a limited number of efficiency problems.	SQL is written with a few minor efficiency problems.	SQL is written in an efficient manor.

CIS233J Rubric

Strong (4)	Acceptable (3)	Unacceptable (2)	Poor (1)
Code is correct and complete	Code is correct and complete	There is one major error or omission with the program code.	There are major omissions and errors in coding
Testing is complete	Testing is incomplete	Testing is complete	Testing was not performed
Documentation is complete	Documentation is incomplete	Documentation is complete	Documentation is missing

CIS179 Rubric

Outcome	1 point	2 points	3 points	4 points	5 points
Use network concepts and terminology to communicate with vendors and users	Unable to use network concepts adequately to find relevant sources	Uses some concepts accurately but unable to find relevant news sources	Uses concepts and applies them accurately, but unable to find relevant news sources	Use concepts, applies them accurately and finds limited value news sources. Limited ability to communicate results	Uses concepts, applies them to find relevant news sources and interprets the results accurately in a clear manner
Design, implement and deploy	Unable to follow system	Limited ability to understand	Understands the first scenario	Understands most	Understands all system scenarios and

systems	definition	what is happening in the system	of the system and can follow the data flow	system scenarios and follows data flow with few errors	follows the data flow with no errors
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