

An On-Line Multi-Disciplinary Computer Information Systems Minor: Responding to Declining Enrollments in CIS Majors

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Abstract

The purpose of this paper is to bring attention to the need to develop new, innovative and quality programs that reverse the decline in CIS enrollments. The multi-disciplinary minor in CIS has proven to be successful in attracting students into the CIS arena. A brief review of the authors' research on declining enrollments is presented as a rationale for this minor. During the 2007-08 academic year, the authors attended National Science Foundation Title III training in preparation for developing the new courses. In order for the new courses to pass the Title III requirements the courses had to meet the expectations of the *Quality Matters (QM) Rubric* by 2006 MarylandOnline, Inc. This paper discusses how the courses were chosen for the minor. The training modules the authors attended are summarized and how this training was used in the development of the new courses for the minor. An overview of the QM Rubric is given and how it was used as a measuring rod (rubric expectations) for the quality of the new minor courses. Example rubrics are presented. An example course syllabus is used to illustrate how various QM rubric expectations are mapped to sections of the syllabus. Pictures of Blackboard folders from one of the courses within the minor are used to illustrate a quality structure and sequence that addresses the QM Rubric expectations. The QM Rubric expectations can be found at <http://www.qualitymatters.org>.

Key Words: Declining CIS enrollments, CIS minor, multi-disciplinary CIS minor, Quality Matters Rubric, QM Expectations, QM Standards

1. THE PROBLEM: DECLINING CIS ENROLLMENTS NOT SEEN SINCE THE EARLY 1990S

The students who choose Computer Information Systems, Management

Information Systems or Computer Science as a major has plummeted to levels not seen since 1997. There was an exponential increase in CIS enrollment between 1997 and 2002. Since the year 2002, the CIS undergraduate enrollment has continued to

decline in the U.S. (Zweben, 2007). Both small and large computing programs alike are in sharp decline with some programs being forced to close (Patterson D. 2005). The decline in CIS enrollment at the authors' university has declined sixty-five percent (65%) since 2001 (Pollacia, Lomerson 2006). Carnegie Mellon, one of the leading CIS programs in the country, has experienced a significant drop in CIS freshman applications (Chabrow, 2004).

2. A PROPOSED SOLUTION: AN ON-LINE MULTI-DISCIPLINARY CIS MINOR

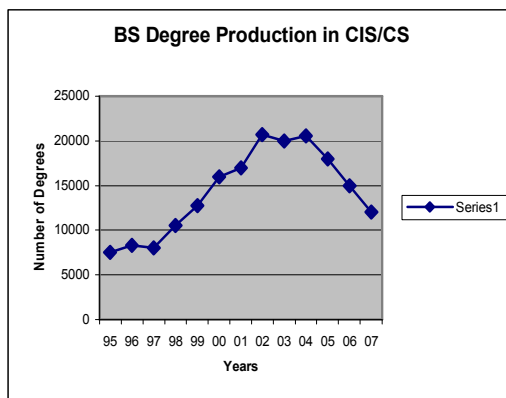
The authors' CIS department developed an on-line, multi-disciplinary minor in CIS, working through the Library Science and Art departments, for the purposes of: 1) providing a stronger computer literacy background for university students at large and 2) to aim at reversing the decline in CIS enrollment at our university. It is hoped that this minor will increase the student head count and Full Time Equivalent (FTE). Furthermore, it is hoped that lower-level students choosing to minor in CIS will also see the benefit to possibly double major in CIS or possibly change their major to CIS. New courses for the minor were developed in conjunction with a grant from the National Science Foundation's Title III program. The university's Electronic and Continuing Education and Distance Learning department provided the Title III training. This training involved several instructional design modules along with a number of technology training and media training modules. All of the training was founded on the Quality Matters Rubric that was developed under a grant from the U.S. Department of Education. The training that was provided enabled the potential courses to be developed that would follow the Quality Matters Rubric. More will be described later about this rubric. The on-line CIS minor courses developed will be discussed, but prior to this discussion the authors want to provide a brief overview of the research that led up this CIS minor.

3. A SHORT REVIEW OF THE AUTHORS' PREVIOUS RESEARCH ON DECLINING ENROLLMENT IN CIS

AND THE NEED FOR A MULTI-DISCIPLINARY MINOR

Declining CIS enrollment is occurring at a paradoxical time with the IS job market in the best growth period in several years (Bureau 2006). Figure 1 illustrates the research on Baccalaureate degree production from 1995 to 2007 (Sweben, 2007).

Figure 1: BS Degree Production from



The U.S. Department of Labor reports that high-level jobs that combine technical and business skills are still abundant in the U.S. The Bureau of Labor Statistics supports this by projecting that the number of IT positions in the industry sector Computer Systems Design And Related Services will increase by 54.6% from 2002 to 2012 (Patterson D. 2005).

It is believed that there that there is a way the numbers can be increased: **increase service-related courses for the general student body.** A department may offer multi-disciplinary minors that incorporate computer-intensive courses taught by other departments. It is believed that new and innovative minors can offer immediate enrollment increases. Reaching a new audience is critical. The development of "computer-centric" minors can restore enrollment into our CIS programs (Patterson, L. 2005). The results of the authors' previous study (Pollacia, Russell, 2007) on this same subject includes information about: 1) Minor Title, 2) Minor Category, 3) the number of credit hours, 4) the various courses offered in the minor and 5) the number of elective hours associated

with the minor. The 2006 Blue Book of Universities was studied for programs with computer-related majors or minors and web site information. In this study the authors extended the survey sample and researched 137 web sites for information about their respective minors especially hoping to find more Composite or Multi-disciplinary minors since these are the types that reach out to other departments.

4. A MULTI-DISCIPLINARY MINOR NEEDED TO MEET UNIVERSITY-WIDE COMPUTER LITERACY

Evidence supports the need for a multi-disciplinary minor in CIS. With a preponderance of disciplines of study now including stronger emphasis on the use of computer technology it seems logical that either the CIS or computer science areas (the university units who are most likely to be adept at teaching computer and information technology) architect minor curricula that addresses this university need. The term, multi-disciplinary, designates minors that focus on the study of information technology through its application in three or more fields. Departments offering technology-centered courses may include art, computer science, English, journalism, biology, etc. (Patterson, Laurie, 2005).

A determination was made of the specific courses included in the minors of the research sample. The following generic course titles were used that either matched or closely matched the university web sites:

1. Introduction to Information Technology (Intro. To IT)
2. Programming I
3. Management Information Systems (MIS)
4. Database Systems (DB or DBMS)
5. Systems Analysis and Design (SAD)
6. Telecommunications
7. Internet and Web Design/Development (Web Design)

A Rationale for More Non-Computer Electives

Figure 2 below illustrates a comparison of the average credit hours with elective credit hours by minor category (Traditional,

Composite and Multi-disciplinary). The Multi-disciplinary category has a higher proportion of elective hours to the number of total credit hours than the other two categories, as would be expected.

Figure 2: Comparison of Average Credit Hours with Elective Credit Hours by Minor Category

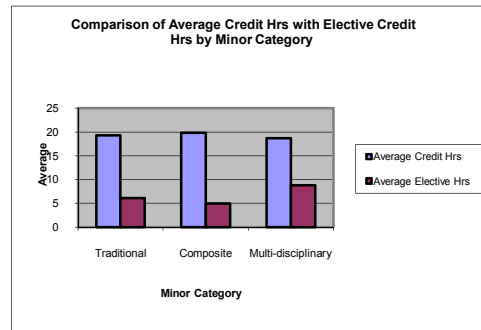
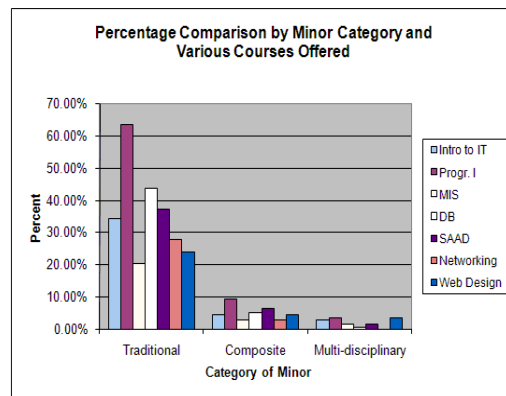


Figure 3 compares the three minors as percentage of the total number of programs researched. It is easy to see that there are fewer multi-disciplinary programs.

Figure 3: Percentage Comparison by Minor Category and Various Courses Offered



The CIS faculty agreed that the new multi-disciplinary minor would consist of the following CIS courses: 1) A required library science course, 2) Introduction to Visual Programming, 3) Introduction to Databases, 4) three elective courses from a specific list. The faculty followed the guideline that these courses should provide an elementary coverage of each subject, but sufficient

course substance to enable the student to function adequately within their own discipline. These courses would not be allowed for CIS/MIS/CS major students.

6. NATIONAL SCIENCE FOUNDATION TITLE III TRAINING:

The NSF Title III training began in the Fall Semester of 2007, and consisted of Instructional Design training and Technology training. There were two levels of training that was required.

Instructional Design and Technology Level 1 Training:

The Level 1 training consisted of topics such as addressing faculty concerns about on-line delivery in general. The instructional design theories were covered including Bloom's Taxonomy (Bloom, 1956). The instruction that faculty received made it very clear that a quality course would cover the various levels of learning outlined by Bloom. From the outset, the faculty learned that a new course would include 1) excellent navigational instructions to make the organization of the course easy to understand; 2) a statement introducing the student to the course and to the structure of the student learning activities; 3) etiquette expectations with regard to discussions, email etc.; 4) self-introduction by the instructor; required introduction of each student via discussion board, minimal technology requirements and minimum student skills needed; 5) learning objectives that describe learning outcomes that are measurable and consistent with the course-level objectives written in a clearly stated format so students could clearly understand the learning outcomes.

The technology training covered many and various topics ranging from simple Windows file management, Adobe Photoshop, Microsoft Audicity (creating MP3 files), Photo Story (creating a picture guided story) and Camtasia (creating podcasts of lectures). The faculty learned how to create a story from PowerPoint slides using Photo Story software. Some faculty also learned Camtasia to create both "voice over" presentations with either PowerPoint presentations or "voice over" with live demonstrations of software demonstrations.

Some faculty learned how to develop podcasts with Camtasia that included Web Cam demonstrations to add a personal touch to the discussions. Faculty learned how to create banners to "brand" the course material, and how to create "pdf" documents for handouts.

Instructional Design and Technology Level 2 Training:

The Title III Level 2 training focused on building course modules that were founded on quality learning outcomes using the Bloom's Taxonomy. This training also focused on how to build rubrics and checklists. The faculty had to build example rubrics that would be used in their classes. The courses were built with the assumption that they pass the *QM Rubric (Quality Matters Rubric for Online and Hybrid Courses, FY 06/07)*. The new courses were submitted for review to a certified instructional design instructor. If the course did not meet expectations according to the rubric then the course was revised until it passed. Only courses that pass the expectations of this Rubric become a part of the NSF Title III online course offerings.

Figure 4: Continuous Improvement Model for Assuring the Quality of Online Courses



Quality Matters created a set of forty specific elements, distributed across eight broad standards, by which to evaluate the design of on-line and hybrid courses. The web-based, fully interactive rubric is complete with annotations that explain the application

of the standards and relationship between them. The eight broad standards include:

1. Course Overview and Introduction
2. Learning Objectives
3. Assessment and Measurement
4. Resources and Materials
5. Learner Engagement
6. Course Technology
7. Learner Support
8. Accessibility

The reader can check out the web site at: <http://www.qualitymatters.org>. Figure 4 illustrates how one's course is evaluated according to the Quality Matters Rubric

Appendix 1 illustrates the basic rubric template that could be followed for measuring a criteria list for an assignment or project. This is a table that includes a column for stated objectives. The columns that follow in Appendix 1 represent the level of mastery of the stated objective. A narrative follows within each successive column that best describes the level of mastery. Typically, four (4) or five (5) levels of mastery are specified with titles such as "Beginning", "Developing", "Accomplished", "Exemplary." Or, possibly the columns can be annotated with "Poor", "Fair", "Good," and "Excellent." The process of identifying the task or performance that the rubric is designed to evaluate should be stated very clearly. There should be at least one measurable difference in the performance list for each objective measured. Appendix 2 is an example rubric from the CIS 3070 (Introduction to Systems Development) course.

7. THE ONLINE MINOR COURSES

Using their previous research, the authors developed a new 18 hour minor with new courses as its core. The highlighted courses are the new courses developed via the Title III Grant. These are the courses that had to meet the Quality Matters Rubric.

- 1) Library Science – Information Sources and Services
- 2) Introduction to Application programming (CIS 1010)
- 3) Introduction to Database Systems (CIS 2070)

- 4) Multimedia Communication and Presentation (CIS 3050)
- 5) Fundamentals of Systems Development (CIS 3070)

The minor curriculum requires students to take the Information Services (LIB 1030). Students may then select one (1) course from CIS 1010, CIS 1030 or CSC 1060. The CIS 1010 is the most rudimentary coverage of visual programming and is the one designed and recommended for the minor who does not plan to pursue a career as a computer programmer. CIS 1030 and CS 1060 are existing rigorous programming courses. Students who have completed the more rigorous can apply them to the minor. The student must select (1) database course from CIS 2070 or CIS 2980. The CIS 2070 is an elementary coverage of MS Access and is the one recommended for minors who have no plans of majoring in CIS. The CIS 2980 is designed for CIS majors, but a minor could take this one instead if she/he had the right background and motivation. This would especially be an alternative for the CIS minor thinking of changing over to a CIS major.

A student would then select three (3) courses from CIS 3020 (Web Page Development), CIS 3050 (Multimedia Communication and Presentation), CIS 3070 (Fundamentals of Software Development) CIS 3100 (Information Systems and Technology in Business), CIS 3980 (Introduction to Information Security), CIS 4030 (Web Applications – Client Side), ART 1110 (Graphic Communication I), and ART 1120 (Graphic Communication II, and). For example, the Art major may choose the ART 1110 and ART 1120 along with, let's say, the Multimedia Communication and Presentation course; while, on the other hand, the business administration major may, for example, select the Web Page Development and the Fundamentals of Systems Development and Information Systems and Technology. This program offers a great degree of flexibility or choice for various majors. Appendix 9 describes some of these new courses.

8. THE QUALITY MATTERS RUBRIC: INSURING QUALITY IN COURSE DEVELOPMENT

The Minor Curriculum Syllabi Examples: How They Support the QM Rubric

Appendices 4 and 5 illustrate two of the syllabi used in the courses. In addition to reviewing the course content for the courses, please pay attention to the rhetoric used in the syllabus related to course objectives, course outcomes, grading and grade evaluation. The syllabi were developed from the *Quality Matters Rubric* previously discussed. Observe the call outs pointing to places that address the *QM Rubric* assessment alignment.

An Example Rubric for a Data Modeling Assignment

Appendix 2 represents a rubric from the Fundamentals of Systems Development course. The stated performance category is, for example, "display of entities." An identifiable performance characteristic for this category is "All entities are correctly displayed with correct rectangular symbol with proper naming convention." This one is rated Excellent. Varying and distinctive levels of performance are shown in each successive column of that row.

9. AN EXAMPLE SYLLABUS AND BLACKBOARD EXAMPLES

How a Syllabus Demonstrates Certain Rubric Standards for a Course

Appendix 3 represents example syllabi from the on-line minor. Notice the "call outs" addressing various rubric standards or requirements.

How Blackboard Folders/Links Demonstrate Rubric Compliancy

Appendix 4 illustrates a Blackboard [Start Here](#) Page that includes a welcome message from the instructor along with a general introduction to the course. This includes a *Photo Story* (podcast) welcoming students to the class along with an introduction to the course. Appendix 5 is the [Course Information](#) folder that contains links to a podcast of the instructor discussing the syllabus. Appendix 6 illustrates the [Module and Assignments](#) folder, and it contains the links to specific modules. The page has step by step instructions on how to complete the

module. Appendix 7 illustrates an example module sub-folder link. It contains links to the actual hard copy document (PDF) that describes the module objectives, notes, assignments and so forth. This appendix also illustrates a link to a *Photo Story* podcast titled "A Systems Analysis Perspective is Critical to the Success of a Project." After the student launches the link to the hard copy module coverage the student will then see the next screen (Appendix 8). Appendix 8 is the hard copy PDF that contains a module overview, module objectives, opening remarks, content, study notes, assignments, activity directions, discussion board postings of assignment and evaluation (the assignment rubric table). "Call Outs" have been placed on the example syllabus (Appendix 3) and on Appendices 4 through 8 to point to specific places within a course where it maps to a specific expectation of the QM Rubric (Appendix 10). Appendix 9 provides a course description of the new courses for the minor. Appendix 10 includes an abbreviated Quality Matters Rubric table. The table lists six of the eight standards previously listed along with an identifying number and description of the criteria. Only six are listed for brevity. Appendix 10 is helpful if the reader wants to associate a rubric referenced in a "call out" on one of the other appendices. For example, the first call out on Appendix 4 says, "Navigational instructions, intro to course, etiquette expectations, instructor introduction and addresses Rubric Standard I.1, I.2, I.4 and I.5". The reader can locate the meaning of this standard in Appendix 10 by examining the second column of the document and locating Standards I.1, I.2, I.4 and I.5.

10. CONCLUSION

From a "lessons learned" perspective, the development of an on-line, Internet class is a lengthy process requiring many hours. For example, the CIS 3070 Fundamentals of Software Development course took approximately 250 hours of dedication outside the office. It is also noted that this did not include class preparation (choosing the textbook, reading the textbook, working the exercises, making up exams etc). This was an arduous process requiring a significant amount of time. As faculty we have lived with a PC and a microphone for

an entire year. As a result of this effort, five quality on-line courses are ready and faculty will begin teaching the first four of these classes (LIB 1010, CIS 1010 Introduction to Programming, CIS 2070 Introduction to Database, and CIS 3050 Multimedia and Presentation) in fall 2008. The CIS 3070 Fundamentals of Systems Development will be offered in the spring 2009. Some of the lessons learned regarding one-line course development include:

1. On the average the faculty devoted approximately three to five times the amount of time normally devoted to the same classroom class.
2. On the average the faculty required 50 to 75 hours to master Camtasia well enough to start producing quality productions.
3. On the average a 15 minute quality Camtasia presentation takes one full day (8 hours) of preparation time. A good ratio to apply is 30 minutes of development time is needed for each minute of a rendered production file.
4. The use of Photo Story added a level of quality to Powerpoint presentations through its multimedia qualities (sound and special effects).
5. The software package, Audicity, enables the teacher to add a personal touch (voice narration) to transcend from one lesson to the next.

Blackboard Organization	<ol style="list-style-type: none"> 3. Provide grading turnaround information 4. Put assignments and modules together within same link
Organizing Presentations	<ol style="list-style-type: none"> 1. Keep presentations short (15 minutes or less) 2. Engage the student with ample hands-on tutorials to solicit immediate feedback 3. Map presentations and tutorials to learning outcomes.
Creating Pod Casts	<ol style="list-style-type: none"> 1. Always create a skit first 2. Always test the microphone before recording. 3. Experiment with Camtasia using trial presentations to verify proper resolution and sound quality.
Testing	<ol style="list-style-type: none"> 1. Use multiple testing features of Blackboard 2. Consider using the "hot spot" testing feature for competency based testing 3. Test more often with short exams (< 20 minutes).

Figure 5 illustrates some suggestions to consider when teaching an on-line class. They come from our "lessons learned" in either teaching prior on-line classes or from the training we received during the Title III classes. The suggestions are categorized by Blackboard organization, organizing presentations, creating pod casts and testing. staff and educators

Figure 5: Suggestions To Consider when Teaching an On-Line Class: Some Lessons Learned

Lesson Learned Category	Action to Take
	<ol style="list-style-type: none"> 1. Require a Start Here button 2. Require submittal

Certainly, the CIS faculty is excited at the possibility of increasing our CIS student head count as well as making a significant difference in the computer literacy level of our university students at large. The authors' next paper will report on the success or progress of this new online minor.

REFERENCES

Bureau (2006) *Occupational Outlook Handbook, 2006-07 Edition*, Bureau of Labor Statistics, U.S. Department of Labor, retrieved from the Bureau of

- Labor Statistics web site on 1/4/2007:
<http://www.bls.gov/oco/oco2003.htm>.
- Chabrow, E., (2004, Aug 16) "By the Book: Declining computer-science enrollments should worry anyone interested in the future of the U.S. IT industry". *InformationWeek*, August, 2004, retrieved from Information Week website on 12/5/2005:
<http://www.informationweek.com/share/d/printableArticleSrc.jhtml?articleID=29100069>.
- Patterson, David A. (2005, September) "Restoring the popularity of Computer Science", *Communications of the ACM*, Vol 48, Issue 9, Sept. 2005, pages 25-28.
- Patterson, Laurie J. (2005, June) "Reaching a New Audience: Development of Computer-Centric Minor", Proc. 2005 ASCUE Conference, Myrtle Beach, South Carolina, www.ascue.org.
- Pollacia, Lissa and Lomerson, William. (2006, October) "Analysis of factors affecting declining CIS enrollment", *Issues in Information Systems*, October 2006, International Association for Computer Information Systems Vol. VII(1), 2006, p. 220-225.
- Pollicia, Russell (2007, October) "Addressing the Decline in CIS Enrollment", *Issues in Information Systems Journal*, International Association of Computer Information Systems, October 2007 (accepted for publication).
- Zweben, Stuart (2005, May) 2003-2004 "Taulbee Survey: Record Ph.D. Production on the Horizon; Undergraduate Enrollments Continue in Decline". *Computing Research News*, Vol. 17/No. 3, retrieved from Computing Research Association web site 7/2/2005:
www.cra.org/CRN/articles/may05/taulbee.html.
- Bloom B. S. (1956) "Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain". New York: David McKay Co Inc.
- QM "Quality Matters Inter-Institutional Quality Assurance in Online Learning, Quality Matters Rubric for Online and Hybrid Courses", Annotated FY 06/07, 2006 MarylandOnline, Inc.
<http://www.qualitymatters.org>

Appendix 1:

A Rubric Template for Developing a Course.

(Describe here the task or performance that this rubric is designed to evaluate.)

	Beginning	Developing	Accomplished	Exemplary
	1	2	3	4
Stated Objective or Performance	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of identifiable performance characteristics reflecting the highest level of performance.
Stated Objective or Performance	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of identifiable performance characteristics reflecting the highest level of performance.
Stated Objective or Performance	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of identifiable performance characteristics reflecting the highest level of performance.

Appendix 2**Data Modeling Rubric from Fundamentals of Software Development Course**

Criteria	Excellent (4 pts)	Very Good (3 pts)	Good (2 pts)	Needs Improving (1 pt)
Display of entities	All entities are correctly displayed with correct rectangular symbol with proper naming convention	All entities are displayed but may not follow proper naming conventions.	Most entities are displayed properly but at least 10 percent are displayed improperly or not at all shown.	Few of the entities have been identified or have been improperly displayed.
Display of Relationships	All relationships are laid out with correct Gane and Sarson relationship lines with proper relationship membership names.	All relationships are displayed but may not have relationship names shown on the relationship lines.	Most relationships are displayed properly but at least 10 percent are displayed improperly or not at all shown.	Few of the relationship lines have been identified or have been improperly displayed.
Display of Cardinalities	All cardinalities are laid out with proper crows feet notation for "many" and hash mark for "one"	90% of the cardinalities are laid out with proper crows feet notation for "many" and hash mark for "one"	80% of the cardinalities are laid out with proper crows feet notation for "many" and hash mark for "one"	Less than 80% of the cardinalities are noted properly on the relationship lines.
Display of Modalities	All modalities are laid out with proper Gane and Sarson (zero to indicate sometimes and a 1 to indicate always.	90 % of the modalities are laid out with proper Gane and Sarson (zero to indicate sometimes and a 1 to indicate always.	80 % of the modalities are laid out with proper Gane and Sarson (zero to indicate sometimes and a 1 to indicate always.	Less than 80% f the modalities are laid out with proper Gane and Sarson (zero to indicate sometimes and a 1 to indicate always.
Display of Associative Entities	All associative entities have been identified, and proper cardinality and modality is shown.	All associative entities have been identified, and proper cardinalities have been shown with some errors relating to modality.	Most associative entities have been identified, and proper cardinalities have been shown with possible errors relating to modality.	Few associative entities have been identified, with proper cardinalities not shown along with possible errors relating to modality

Appendix 3

Example Syllabus for the Minor

(A Few "call outs" are shown to simply illustrate how the syllabus is mapped to the QM Rubric



CIS 2070 – Introduction to Database Systems

Professor: Dr. Lissa Pollacia
Office: 114 -D, Russell Hall
Phone: (318) 357-5718
Fax: (318) 357-5990
Email:

Course Description: Introduction to the database concepts and software skills necessary for the design and development of a basic database system. This includes the tables, queries, forms, reports, and web pages within the database.

Prerequisite: CIS 1010, CIS 1030 or CSC 1060.

II.2 Rubric Expectation

Course Objectives: Upon completion of the course the student will be able to:

1. Define fundamental database concepts.
 2. Create a new database based on the Relational model.
 3. Create and utilize database tables, queries, forms, and reports.
- Develop a complete database application from the design stage to implementation.

IV.4 Rubric Expectation

Required Textbooks:

New Perspectives on Microsoft Office Access 2007, Brief Edition, Joseph J. Adamski and Kathleen T. Finnegan, Course Technology Publishing. (ISBN-13: 978-1-4239-0587-5)

I.6 Rubric Expectation

Technology Requirements

- A computer** with the following minimum configuration:
- Microsoft Windows 2000, XP or later version
 - 800 MHz processor
 - 512 MB of RAM (main memory)
 - 40 MB of hard-disk space for program installation



- **Microsoft Access 2007** for completing the required tutorials and case studies. Access 2007 is included in Office Professional 2007. (Many computers only have Office Standard or Small Business, which does NOT include Access, so you have to check.)
- To check a computer for Access 2007: click **Start | All Programs | Microsoft Office**, and you should see **Microsoft Office Access 2007**. If you do not see this listed, then Access is not installed on that computer.)
- **Optional: USB flash drive or CD-RW** for saving/backing-up large assignment files. Your assignments can, of course, be saved to your hard drives, but with the advent of the USB drive (thumb drive); it is very inexpensive and convenient for making a backup copy.

You must obtain the textbook and have a computer with Access 2007 as soon as possible. You may download free version of Access 2007, by sending an email to Karl Knotts at knottsk@nsula.edu. He will send you a link to the website, and a username and password that are required to access the website.

V.2
Rubric
Expectation

Course topics: The following topics will be covered in this course:

1. Introduction to Database Management Systems
2. Data organization, entities and relationships
3. The Relational Database Model
 - 3.1. Tables: primary key
 - 3.2. Relationships: foreign keys
4. Creation of a database in Microsoft Access
5. Table creation and maintenance
6. Adding data to a table, importing data from worksheet and text file
7. Defining a relationship between two tables
8. Updating the data stored in a database
9. Developing queries
 - 9.1 Record selection criteria
 - 9.2 Sorting data in a query

- 9.3 Calculated fields
- 9.4 Using aggregate functions
- 9.5 Multiple selection criteria with AND and OR logical operator
- 9.6 Developing a join query

Grading: Your grade will be calculated by dividing the number of points that you have earned by the total points. The table below shows an approximate number of points for each activity. You will be assigned a grade based on the following grading scale:

ACTIVITY	POINTS
TUTORIALS	200
EXAMS	200
QUIZZES	100
Discussion/Database Design	50
SEMESTER PROJECT	200
TOTAL	750

III.1
Rubric
Expectation

Grading Scale

A = 90 - 100%
 B = 80 - 89%
 C = 70 - 79%
 D = 60 - 69%
 F = < 60%

QM Rubric
Expectation

Submitting Assignments:

Assignments are due by 8:00 a.m. Central Standard Time on the date indicated.

There is no penalty for posting assignments before the due date.

Late Assignments:

Assignments posted up to one (1) week late will receive only half of the total points for that assignment.

Assignments posted more than one (1) week late will receive 0 points unless there are extenuating circumstances.

Course Calendar: See **Course Calendar** document in *Course Information*.

Instructor Response and Availability: The instructor will:

- Check and grade assignments within one week after the due date.
- Respond to emails within 48 hours of receipt during the week. The 48-hour period does not include weekends and university holidays.



Appendix 4

A Start Here Button in Blackboard: 1) Welcome 2) Syllabus Discussed 3) Assignment Submittal Policy and Rubric Expectations Shown as a Call Out

The screenshot shows the Blackboard course interface. On the left is a navigation menu with buttons for 'Start Here', 'Announcements', 'Course Information', 'Assignments - Mod', 'Staff Information', 'Discussion Board', 'Trial Tests', 'Learner Support', 'Tools', 'Communication', 'Course Documents', 'Assignments', 'External Links', and 'Examinations'. Below this is a 'Tools' section with 'Communication', 'Course Tools', 'Course Map', 'Control Panel', 'Refresh', and 'Detail View'. The main content area is titled 'Audio Files' and contains several items:

- Start here by listening to the Welcome message.** (Callout: Navigational Instructions, intro to course, etiquette expectations, instructor introduction etc.)
- Introduction to Systems Analysis: Getting Started with the Course** (IntroToSystemsAnalysis_Getting Started with the Course Session 1_1.w...)
- Discusses the Syllabus for the Course** (CIS 3070 Syllabus Discussed by DrRussell Cam_Prodver.zip (Package File)) (Callout: Course Objectives clearly stated in two places)
- Course Objectives Document** (CIS_3070_Course Objectives.pdf (8.422 Kb))
- CIS 3070 Syllabus Document** (CIS_3070_Syllabus Title III_Minor.pdf (38.621 Kb))
- Assignment Submittal Policy and Rules** (rules.jpg (3.456 Kb) and Turning in Assignments.pdf (203.46 Kb)) (Callout: How to submit assignments and take exams: Rules and Policies)

A blue 'RULES' logo with a scale of justice is also visible.

Appendix 5 A Course Documents Folder with Voice-Over Coverage of Syllabus

The screenshot shows the Blackboard course interface with a 'Course Documents' folder selected. The main content area contains:

- An Intro to the Course by Dr. Russell (PhotoStory Version)** (IntroToSystemsAnalysis_Getting Started with the Course Session 1_1.wmv (3.422 Kb)) (Callout: An introduction to the course:)
- Dr. Russell Talks about the Syllabus (Voice Over Camtasia Version)** (CIS_3070_Syllabus Discussed by DrRussell Cam_Prodver.zip (Package File)) (Callout: A podcast discussing the syllabus)
- CIS 3070 Introduction to Systems Development Syllabus Document** (CIS_3070_Syllabus_Jack_Russell.pdf (38.788 Kb))
- Course Objectives Document** (CIS_3070_Course Objectives.pdf (8.422 Kb))


Appendix 6 Learning Modules and Accompanying Assignments

The screenshot displays two learning modules in a Blackboard interface. The first module, 'Module 1: Introduction to Systems Development', includes a video thumbnail and a list of five tasks: clicking into the module folder, reading a week 1 document, viewing three podcast sessions, and submitting an assignment. The second module, 'Module 2: Managing a Project', includes a video thumbnail and a list of six tasks: printing a document, watching a podcast, completing an assignment, following submission instructions, and checking the grade. Callouts identify the folder as 'The Modules and Assignments Folder' and the module links as 'Module links that carry student to actual module documents, Podcasts, and Assignments'.

Appendix 7 Example Module Folder

The screenshot shows a Blackboard module folder titled 'Module 1: Introduction to Systems Development'. It features a toolbar with icons for Item, Folder, External Link, Course Link, and Test. Two items are listed: 'Module 1: Introduction to Systems Development: Overview: Directions, Assignments, Grading Criteria' (a PDF document) and 'Session 1: Module 1: Watch and Listen: "A Systems Analysis Perspective is Critical to the Success of System Development"' (a video). Callouts describe the PDF as 'Module content – hard copy' and the video as 'An example session telling student to Watch and Listen to a Podcast'.

Appendix 8: A Sample Module Document and QM Expectations



Module 1 – Week 1
Introduction to Systems Analysis and Project Initiation

A Quality Matters
(QM) Expectation

Module Overview:

This first module is an overview of the systems development process. It discusses the planning, analysis, design and implementation of a business system project. It discusses what kicks off a systems project and the actual deliverable(s) of each phase.

Module 1: Week 1 Objectives:

1. Identify and describe the phases within the systems development process. This will require you to explain the activities within each of the four (4) phases.
2. Identify and describe at least three (3) methodologies used with in the systems development life cycle.
3. Complete a feasibility analysis using an Excel spreadsheet identifying both benefits and costs for a business system.
4. Complete a Gantt chart illustrating the various tasks within a systems development project.

Opening Remarks from Instructor:

Welcome to Fundamentals of Systems Development. During your chosen career, whatever it might be, you will likely be involved in the computer automation or improvement of some activity within your work organization, business, agency or unit. The more you know about this systems development process the better you will be able to participate toward the improvement of your job. The implementation of a computer-related improvement to an organization requires information technology specialists working with the people that knows the operation or organization well enough to create positive change. People must know how to work with systems design and software development tools, and also they must know how to work with people and within teams. They must know how to work with precision using specific methods and techniques. The team that you will be a part of needs to be able to develop a set of system requirements (what the system must be able to accomplish). A successful project will require not only information technology expertise, but it also requires users (maybe people like you.)

Appendix 8 Continued (Page 2)

A QM Expectation

Content:

- Podcast: "Getting Started with CIS 3070 Introduction to Systems Development."
- Podcast: "What and How to Send Assignments to your instructor, Dr. Jack Russell."
- Podcast: "A Systems Analysis Perspective is Critical in Software Projects"

Study Notes

Read Chapters one (1) and two (2). Chapter 1 is titled "Introduction to Systems Analysis and Design." Chapter 2 is titled "Project Initiation." The key idea in Chapter 1 is to explain the magnitude of the process of managing, modeling and designing a business system. The chapter starts off making sure you understand that the development process is formidable and requires IT specialists working with decision within teams with powerful modeling software tools and methods. These projects require direction and leadership from the top. The chapter gets your attention and asks "why do 42 percent of all business systems fail to be completed or canceled?" The authors also ask, "why do 53 % of all government projects fail?" The chapter discusses the four main phases of the systems development life cycle, and discusses the purpose and deliverables of each. The chapter discusses the major methodologies that can be followed when planning, analyzing, designing and implementing a business system. Chapter 2, Project Initiation, discusses the activities surrounding the document called the "User Request", and emphasizes that the analyst must identify how the new project will generate revenue and/or reduce costs. A study of the feasibility analysis process includes cost-benefit analysis, rate of return on investment and break-even analysis. Projects often never reach fruition unless business value is clearly identified and a work plan is approved by a management approval team.

Assignment # 1

- Read Chapter 1 from the textbook.
- Watch the PowerPoint on Chapter 1 found in Course Documents of Blackboard.
- Complete the Assignment 1 Questions found in the Assignments folder.

Here are the parts that should be included with each assignment

- **Activity Directions:**
The question is to be typed prior to providing the answer. The document is to be done in Microsoft Word in Verdana style (12 point).

Appendix 8 Continued (Page 3)

Post your answer to Question 18 to the discussion board, "What are the six skills all project team members should possess?" Defend your position on at least 2 of these skills. Also, post a response to one other team members response to this question.

• **Evaluation (assessment)**

You will be evaluated on the following criteria questions.

- 1) Was the question typed?
- 2) Was the answer structured into bullet points?
- 3) Was the narrative answer free of grammatical errors?
- 4) Were the answers to each question extracted from the material, but not plagiarized? Paraphrasing is satisfactory in some cases, but the answer should be a signature of your interpretation of the material.

QM Expectations

You will also be evaluated with an on-line multiple choice examination using Test Manager of Blackboard. A list of sample questions are found under "Module Exam Review" in the Course Documents folder.

Points	Interpretation	Grading Criteria
90-100	Excellent (A)	The answer is accurate. It indicates the student carefully read and interpreted the chapter material. The student was thorough to not only identify or enumerate but also was able to explain the answer carefully.
80-89	Above Average (B)	The answer lacks at least one of the criteria above. The student's content answer is correct, but lacks thoroughness or possibly lacks detailed explanation.
70-79	Average (C)	The answer lacks some degree of correctness or was answered with little detail. The answer would contain correct lists or correct definitions, but lacks at least two of the criteria in row 2 above.
60-69	Below Average	The answer partially disagrees with textual material in the chapter; and, exhibits carelessness or a lack of completeness.
<60	Poor (F)	The answer mostly is incorrect and disagrees with the textual chapter material, is too brief and or shows lack of commitment.

Appendix 9

The New Courses for the Minor

LIB 1030 Information Sources and Services (3-3-0) The student will learn how to identify and evaluate information from various formats, sources and services using basic and advanced searching techniques. They will gain an understanding of the cultural and social contexts in which information is produced and disseminated. Issues of ethical and legal use of information, including copyright, intellectual property, and plagiarism will be explored within the context of current trends in academic plagiarism and media piracy. This is a foundational course. No prerequisites or co-requisites are required.

CIS 1010. Introduction to Programming Concepts

Description of course: Students are introduced to the basic elements of developing programs by manipulating characters and objects in an interactive 3D world. Concepts addressed include components of programs, object oriented program elements, basic programming methods, and simple program design. Prerequisite: General familiarity with operating a computer and using basic features of a word processor program.

CIS 2070. INTRODUCTION TO DATABASE APPLICATIONS. (3-3-0). Introduction to the database concepts and software skills necessary for the design and development of a basic database system. This includes the tables, queries, forms, reports, and web pages within the database. Prerequisite: CIS 1010, CIS 1030 or CSC 1060.

CIS 3050 Multimedia Communication and Presentation. (3-3-0) Emphasis on planning and delivering presentations enhanced by multimedia within a professional work environment. Concepts, design, and experience in developing multimedia presentations. Open to all majors. Prerequisite: CIS 1800 or equivalent course.

CIS 3070. A project-oriented study of the development of small business systems. Students will analyze, design and implement some application of a small business system. Students will learn how to design and write a proposal (requirements statement and business model). Students will develop a small database using MS Access and design and create the user windows interface. The application will be implemented using either MS Access Switchboard or MS Visual Basic.

Appendix 10

The QM Rubric

	Review Standards	Points	Yes	No
Course Overview	I.1 Navigational instructions make the organization of the course easy to understand.	3		
	I.2 A statement introducing the student to the course and the structure of the student learning process.	3		
	I.3 Etiquette expectations with regard to discussions, email, and other forms of communication are stated clearly.	2		
	I.4 The self-introduction by the instructor is appropriate and available online.	1		
	I.5 Students are requested to introduce themselves to the class.	1		
	I.6 Minimum technology requirements, minimum student skills, and, if applicable, prerequisite knowledge in the discipline are clearly stated.	1		
Learning Objectives	II.1 The course learning objectives describe outcomes that are measurable.	3		
	II.2 The module/unit learning objectives describe outcomes that are measurable and consistent with the course-level objectives.	3		
	II.3 The learning objectives are stated clearly and written from the students' perspective.	2		
	II.4 Instructions to students on how to meet the learning objectives are adequate and stated clearly.	2		
	II.5 The learning objectives address content master, critical thinking skills, and core learning skills.	2		
Assessment and Measurement	III.1 The types of assessments selected measure the stated learning objective and are consistent with course activities and resources.	3		
	III.2 The course grading policy is stated clearly	3		
	III.3 Specific and descriptive criteria are provided for the evaluation of students' work and participation.	3		
	III.4 The assessment instruments selected are sequenced, varied and appropriate to the content being assessed.	2		
	III.5 "Self Check" or practice types of assignments are provided for timely student feedback.	1		
Resources and Materials	IV.1 The instructional materials support the stated objectives	3		
	IV.2 The purpose of each course element is explained.	2		
	IV.3 The instructional materials are logically sequenced and integrated.	1		
	IV.4 All resources and materials used in the course are appropriately cited.	1		
Learner Engagement	V.1 The learning activities promote the achievement of stated learning objectives.	3		
	V.2 Learning activities foster instructor-student, content-student, and if appropriate to the this course, student-student interaction.	3		
	V.3 Clear standards are set for instructor response and availability.	3		
	V.4 The requirements for course interaction are clearly articulated.	2		
	V.5 The course design prompts the instructor to be active and engaged with the students.	2		
Course Technology	VI.1 The tools and media support learning objectives.	3		
	VI.2 The tools and media enhance student interactivity.	3		
	VI.3 Technologies required are either provided or easily downloadable.	2		

Note: This table does not include Learner Support; nor accessibility standards due to space limitations of the paper.