Oklahoma City Community College

Program Review Self Study Year: 2012-2013

Division of Information Technology

Associate in Science in Computer Science (106)

Options: Management Information System
Computer Science
Cyber/Information Security

Prepared by:

Ms. Vicki Gibson
Dr. James Bothwell
Dr. Haining Chen
Mr. Al Heitkamper
Mr. Haifeng Ji
Ms. Sara Mathew
Ms. Anita Philipp
Ms. Mary Williams

I. Introduction

This section should reference the general process of the review and any unique features of the review (such as the use of outside consultants or conducting the review in relation to an accreditation visit).

If the program has been reviewed previously, this section should include a brief summary of prior recommendations and how they were addressed.

1. Enrollment: The ongoing trend is a declining enrollment in computer science courses.

Addressed: Visits were made to area high schools to increase awareness; continued to focus on current student advisement to increase retention; broadened the online course offerings to increase the pool of possible students and to meet the scheduling needs of students; MIS was increased to 62 hours to meet the core competencies; faculty gave input on revamping of math courses as they affected CS courses; added VB or Java to align with OU; changed the MIS degree to include Intro to Computers as a general education course and Computer-Based Information Systems to be a major requirement; implemented the change of Microeconomics being before Macroeconomics in the degree plan to align with curriculum change made by Business Division.

2. Budget Process: The three year replacement cycle is no longer in effect for computer hardware. This means that replacement equipment is requested as initiatives. This process requires the replacement of classrooms and labs to be the highest priority on the IT Division initiative list and often eliminates other considerations.

Addressed: Despite our advocacy, the budget process has not been changed. The faculty continue to consider the replacement of equipment as our top priority for the budget process.

3. Difficulty hiring faculty and staff: The positions that have been advertised in the last five years have produced extremely low numbers of candidates and often require several searches. This may become a larger concern as many of the faculty are at or near retirement eligible age.

Addressed: Advertised the openings in more places, including online job sites; explored other ways to encourage qualified applicants to consider OCCC; continuously refined the job description to attract a larger pool of applicants. Four unsuccessful searches were completed and 1 successful search. We believe the salary is the core problem due to disparity with IT market salaries. We are still down 2 full time positions in our staffing plan.

II. Executive Summary

The Executive Summary will include the program's connection to the institution's mission, program objectives, and the strengths and areas for improvement of the program. It will also include the key findings and recommendations of the internal or external reviews with regard to the Program Review Principles and Program Review Criteria.

The computer science program at OCCC provides high quality education to students that wish to continue their education at four year institutions.

Strengths

The current faculty have shown a consistent dedication to maintaining the excellence of the program and success of the students. They maintain a knowledge base in their area of expertise and demonstrate a flexibility to explore new emerging areas. Two new excellent CS faculty were hired.

The hardware and software has consistently been the current state of the art in both the classrooms and labs. This ensures the students will be up to date when they graduate and enter the work force.

Continued use of the Student Computer Center (SCC) has created a friendly, efficient location for students to continue the learning process outside of the classroom. Excellent lab tutors and supplemental instructors have been hired.

The number of online classes has been increased due to student demand.

We have been recognized as a National Center of Academic Excellence in Information Assurance.

Close cooperation with UCO and OU Computer Science and Management Information Systems departments and individual faculty greatly enhances transfer opportunities for students.

Concerns

The hiring of faculty is a concern for this program. Salaries are not competitive with market exacerbated by nearly 50% of full time faculty eligible for retirement.

Faculty are finding it harder to work with students due to the fact that many students don't have course materials at the beginning of class and many of our courses are based on software purchases.

Faculty do not receive notification of the withdrawal of students, and this is detrimental to student retention/ completion and program assessment.

Because the Student Computer Center is such an asset we feel we should support and encourage the lab employees by helping them maintain proficiency in subject areas.

Recommendations

The faculty recommend to explore ways of providing salaries competitive to the business job market.

A procedure on campus to allow students to obtain materials for their classes by the first day of class would be beneficial to the success of the students.

To support the development of lab staff we recommend to establish a system to use scheduled lab hours to have lab personnel sit in on a class at least once a year per faculty recommendation.

As far as the institution is concerned we see disbursement of financial aid and lack of materials for the first day of class to be of concern.

Financial aid should be disbursed at or near the beginning of the semester so students can obtain materials by the first day of class.

There should be a process in place to extend financial credit to students to purchase necessary classroom

materials by the first day of class.

III. Analysis & Assessment

This section will include a complete review and analysis of the Program Review Criteria based on the internal or external team's review. It will also assess developments since the last program review in the context of the current recommendations of the internal review and any recommendations.

A. Centrality of the Program to the Institution's Mission

An assessment and written analysis as to the centrality of the program to the institution's mission and in the context of the institution's academic plan are required. The purpose of the mission of an institution is to indicate the direction in which the institution is going now and in the future. The mission defines the fundamental reason for the existence of the institution.

Together with the planning principles and goal statements, the mission reveals the philosophical stance of the institution with respect to education and learning while at the same time providing a framework for the maintenance of institutional integrity and development.

Describe how the program is central to the institution's mission:

The computer science program at OCCC provides high quality education to students that wish to continue their education at four year institutions. The program has produced 73 graduates in this five year period.

B. Vitality of the Program

Vitality of the program refers to the activities and arrangements for insuring its continuing effectiveness and efficiency. To maintain its vitality and relevance, a program must plan for the continuous evaluation of its goals, clientele served, educational experiences offered, educational methods employed, including the effective incorporation of technology, and the use of its resources. This vital principle or force can best be observed by examining the past and present initiatives to insure the vitality of the faculty, students, and program.

1. List Program Objectives and Goals

Students will successfully complete a common core of at least one class in each of the following categories: Beginning Programming with a grade of C or higher, Programming Language with a grade of C or higher, Advanced level math course. Students will complete 62 credit hours.

2. Quality Indicators

Quality indicators may vary by institutional mission; however, institutions should measure the efforts and quality of their programs by: faculty quality, ability of students, achievements of graduates of the program, curriculum, library, access to information technology resources including efficiencies and improved learner outcomes through appropriate use of this technology and appropriate use of instructional technology to achieve educational objectives, special services provided to the students and/or community, and other critical services.

As appropriate, institutions should evaluate the program against industry or professional standards utilizing internal or external review processes. Institutions must provide specific documentation of student achievement. Such documentation should include programs outcomes assessment data consistent with the State Regents' *Assessment Policy*. Program quality may also be reflected by its regional or national reputation, faculty qualifications, and the documented achievements of the graduates of the programs. This includes a program self review that provides evidence of student learning and teaching effectiveness that demonstrates it is fulfilling its educational mission and how it relates to Higher Learning Commission Criteria and Components listed below:

a. The program's goals for student learning outcomes are clearly stated for each educational program and make effective assessment possible. List of the student learning outcomes.

1. Students will be able to use the proper control structure to solve a process. (FY 09)
2. Students will be able to subdivide a complex problem into appropriate program modules, with parameter passing. (FY10)
3. Students will be able to perform input/output processing involving creation and modification of files. (FY11)
4. Students will be able to write object-oriented programs. (FY 08 & FY12)
5. Students will be able to perform necessary operations to compile and execute programs. (FY 09)

Well defined the criteria for measurement and how the criteria were used in the program.

Outcome 1. Students in CS 1143 - Beginning Programming will be assessed on their performance on problems requiring use of the proper control structure to solve a problem. 70% of students assessed will perform at an acceptable level (70%) or higher on the assessment.

Outcome 2. Students in CS 1143 - Beginning Programming will be assessed on their ability to subdivide a complex problem into appropriate program modules, with parameter passing. At least 70% of assessed students will perform at a minimum of 70% level on the assessment. The student's performance will be measured using a competency checklist.

Outcome 3. Group 1: Students in CS 2163 Java will be assessed on their performance on a given problem requiring them to perform input/output processing involving creation and modification of files. At least 70% of assessed students will perform at a minimum of 70% level on the assessment.

Outcome 3. Group 2: CS Students in 2453 Visual Basic will be assessed on their performance on a given problem requiring them to perform input/output processing involving creation and modification of files. At least 70% of assessed students will perform at a minimum of 70% level on the assessment.

Outcome 4. Group 1: Students in CS 2163 - Java will be assessed on their performance on class assignments requiring use of object-oriented programming. At least 70% of assessed students will perform at least a 70% level on the assessment. The students' performance will be measured using a competency checklist.

Outcome 4. Group 2: Students in CS 2453 - Visual Basic.NET will be assessed on their performance on a given problem requiring them to write an object-oriented program. At least 70%

of assessed students will perform at least a 70% level on the assessment.

Outcome 5. Students in CS 1143 - Beginning Programming will be assessed on their performance on problems requiring necessary operations to compile and execute programs. 70% of students assessed will perform at an acceptable level (70%) or higher on the assessment.

The evaluation, results, and recommendations based on the criteria used.

Outcome 1. 69 students in CS1143 were assessed. 94% (65) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. The course should continue to use C++ language as the programming tool.

Outcome 2. 72 students in CS1143 were assessed. 87.5% (63) of the students scored at least 70% on the assessment. The data suggests that the approach we are using is effective.

Outcome 3. Group 1: 41 students in CS2163 were assessed. 80.5% (33) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. We will continue teaching the module to perform input/output processing involving creation and modification of files where we have it in the Syllabus for now as it seems to be producing improved student understanding.

Outcome 3. Group 2: 19 students in CS 2453 were assessed. 84% (16) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. We will continue teaching the module to perform input/output processing involving creation and modification of files where we have it in the Syllabus for now as it seems to be producing improved student understanding.

Outcome 4. Group 1: 26 students in CS 2163 were assessed. 84% (22) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. CS 2163 should continue the current method of instruction.

Outcome 4. Group 2: 15 students in CS 2453 were assessed. 60% (9) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. CS 2453 has moved the concept earlier in the semester to allow more time for explanation and application.

Outcome 5. 86 students in CS1143 were assessed. 71% (61) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. The course should continue to use the current text and methods to teach compilation and program execution.

General Education requirements represent just over sixty percent of each Associate of Science or Associate of Arts degree, making the careful assessment of these broad competencies OCCC considers essential for all graduates very important.

Strategy:

The General Education Committee will create six interdisciplinary teams with members from multiple divisions. Each team will consist of five members with two members specifically teaching in one of the General Education Core Areas. Also, at least one team member will be a representative of the General Education Committee.

Twice a year these teams will evaluate one hundred artifacts from students having attained at least 36 hours of General Education Courses from OCCC. Reports, recommendations, and actions created from the General Education Assessment Process will be stored on the General Education Committee Website.

Evidence should be presented that shows a systematic review of the curriculum is conducted regularly. This review should indicate how the general education competencies are being met:

General Education Assessment Plan

Objective:

To assess and recommend actions for the general education component of Oklahoma City Community College's curriculum.

Method:

Developed rubrics will provide common criteria for assessing “artifacts” gathered from various courses. Artifacts may include but are not limited to recorded performances, PowerPoint Presentations, essays, lab reports, research projects, service-learning projects, or any assignment preexisting in a faculty's course.

Nevertheless, the underlying principle of this method is (1) to reduce the intrusive nature of assessment within faculty courses, (2) to create a real environment of student performances within a classroom setting instead of a contrived environment of a forced examination (i.e. CAAP exams not counting for a classroom grade), and (3) to collect artifacts already designed and administrated by our professional faculty at OCCC.

Data Collection:

The Office of Institutional Effectiveness will identify each semester students completing at least 36 credit hours in General Education Courses.

The General Education Core

General Education at Oklahoma City Community College is an integral component of each student's experience. Every student receiving an Associate Degree (AAS, AA, or AS) must complete at least one course from each of the following areas, indicating a general understanding of that area.

I. Human Heritage, Culture, Values
II. Public Speaking
III. Writing
IV. Social Institutions
V. Mathematical Methods
VI. Scientific Methodology

Program Response to General Education Assessment Data

Provide Evidence that shows a systematic review of the curriculum is conducted regularly. This review should indicate how the general education competencies are being met.

The CS faculty conducts an annual review and alignment with our receiving transfer institutions to be sure General Education requirements for OCCC and the Higher Regents are being met. Student success in CS courses is being enhanced by general education courses.

b. The program values and supports effective teaching.

Faculty Performance Review and Evaluation

Faculty will be evaluated on the basis of the established standards of performance and objectives established in the person's contract and any subsequent memorandums of agreement established for the position/person. Faculty are defined as employees who primarily perform teaching and instruction-related duties and who are employed on the basis of a written contract setting forth the duties to be performed and the compensation to be paid. The performance appraisal for each faculty member will be conducted by the Division Dean or Director as appropriate.

Course and Faculty Evaluation

The Student Input on Instruction process is a means of gathering student perceptions of instruction at the college. The results are intended to be used by faculty as means of identifying ways to improve instruction. A copy of the questionnaire may be found in the appendix of this document. Up to three (3) questions, unique to the course or section, may be created for inclusion as optional questions. The forms and supportive instructions will be available to students online during the 8th, 9th, or 10th week of 16-week courses or the 5th or 6th week of eight-week courses.

c. The program creates effective learning environment.

Courses are offered in a variety of formats to include on-campus, online, 16 week, 8 week, 4 week, and 2 week sessions. A variety of methodologies are used. Maximum class size is set to 20-23 students. Computer equipped classrooms are used in all classes. Current technology is supplied as appropriate for the course and is continually upgraded to teach the most recent versions of software. Good replacement cycles for computers have been honored in the budget cycle. WiFi allows students to work throughout the campus. Acquired mobile devices to teach within classrooms (iPad, Android tablets, Mac minis, wireless routers, Network interface cards). Student Computer Center has 110 computers available from 7:30 am - 10:45 pm most days for students to use. Tutors are available in the Student Computer Center for all CS courses for individual assistance. Excellent leadership contributes to our learning environment. Supplemental Instructors are made available in some upper level courses. Center for Learning and Teaching has provided excellent training and development to contribute to the learning environment. The faculty are continually pursuing professional development opportunities to keep courses current.

d.The program's learning resources support student learning and effective teaching.

Computer Science programs' enrollment increases every year. No significant changes are expected in the near future. Faculty assign papers and expect students to use the Library resources to complete those assignments. Because of the pre-requisites for these programs it is assumed that students received Library Instruction in their English Composition classes or the Success in College and Life course.

The Library Liaison contacts program faculty for suggestions to the collection, and faculty provide excellent guidance in collection development. Faculty use the Reserve collection to make textbooks available for students.

Library Print and Online Resources

The Library's array of resources --both online and in other formats --continues to grow and evolve. All of the online resources are available to students-- anytime, any place. The Library has about

113,000 items --including books, ebooks, DVDs, videos and online films.

The Library continues to subscribe to a wide variety of excellent online article databases such as EbscoHost, as well as many print periodicals. With student and faculty preference for online resources, use of print periodicals has dropped notably and the librarians anticipate cancelling print subscriptions that are duplicated in our electronic resources in coming years.

For the past several years the Library has provided access to *Films on Demand*, an online streaming video service, via the Library website. *FoD* is multi-disciplinary. Its thousands of complete films, as well as convenient short clips, are searchable by discipline, topic and title. Feedback has been positive and integration into the online learning platform appears to be working.

Computer science faculty were made aware of Films on Demand and how it could be used in their classes. They were not aware of that resource. The Liaison did a few searches in many different classes, demonstrating what is available and that most films are closed captioned. The Liaison received positive response from the professors.

The Library continues to improve the regular book collection, while adding options --a new ebook service, Overdrive, primarily for leisure reading, and in fall 2012 EbscoHost's Community College eBook Collection, 40,000+ titles covering many different academic programs and topic areas. On a regular basis old and ragged print materials are weeded.

Because the Library budget for materials acquisitions continues to be good, librarians are usually able to accommodate faculty requests for purchase.

Library Instructional Resources

The value of excellent research collections, whether online or in print, depends also on whether or not students are aware of and have the skills to use them. Experience shows that typical students are not aware of resources available, but instead are “looking around on the Internet” with often very limited success.

Many students enroll in the one credit hour Success in College and Life course, in which they receive instruction in doing academic research. The librarians also teach class sessions in a wide variety of subject areas. Sessions are usually hands on, held either in the Library's instruction area or in the students' regular classroom, but flexibility is key. And as always, librarians staffing the Library Assistance desk answer informal student questions and provide one-on-one instruction.

In sum…

Overall, the Library has 76 computers for student research, online coursework, etc. More than half of these are set up with DVD players and headphones. The building now has wireless access throughout. From the Library's web page students both on- and off-campus can use the catalog of books and DVD/videos, search for quality information in many online article databases, link to tutorials and make online requests.

Librarians are committed to supplying the right resources and helping students and faculty use them well. The Library has a strong budget and responds to faculty requests or suggestions about useful resources. Neither is expected to change.

e. The institution's curricular evaluation involves alumni, employers, and other external constituents who understand the relationship among the course of study, the currency of the curriculum, and the utility of the knowledge and skills gained.

OCCC has established specific curriculum patterns for transfer programs leading to the Associate in Arts (A.A.) or Associate in Science (A.S.) degrees. Describe program coordination efforts, partnerships and relationships with transfer institutions.

CS and MIS faculty meet with OU and UCO annually to align curriculum. We coordinate with individuals at receiving institutions throughout the year on individual course content to assure transferability of courses. We attend OSRHE transfer meetings and update the transfer grid. We currently have an articulation agreement with UCO in CS.

f. The organization learns from the constituencies it serves and analyzes its capacity to serve their needs and expectations.

Student Input on Instruction forms are reviewed by faculty. Input is taken at Advisory Committee meetings from industry members. Even though the meetings are for AAS, all faculty attend and there is some commonality of courses. Faculty development plans are made and executed each year. Student satisfaction survey results are monitored. The schedule-building process is attuned to student demand. Faculty keep up-to-date on computer software and hardware. Student assessment of learning is conducted. Graduation survey results are reviewed each year.

3. Minimum Productivity Indicators

The following are considered to be the minimum standards for degree program productivity (averaged over five years). Programs not meeting these standards may be identified for early review as low producing programs. Institutions will be notified of programs not meeting either one of the two standards listed below and other quantifiable measures in this section.

a. Number of degrees conferred (averaged over five years, minimum standard: AA/AS/AAS 5)

2012 - 16
2011 - 12
2010 - 14
2009 - 13
2008 - 18
Five year average 14.6

b. Number of majors enrolled (averaged over five years,minimum standard: AA/AS-25 AAS-17)

2012 - 404
2011 - 405
2010 - 343
2009 - 291
2008 - 293
Five year average 347.2

4. Other Quantitative Measures

a. The number of courses taught exclusively for the major program for each of the last five years and the size of classes for each program level listed below:

Courses taught - 1000 level
2012 - 71
2011 - 77
2010 - 72
2009 - 75
2008 - 79

Courses taught - 2000 level
2012 - 47
2011 - 46

2010 - 52
2009 - 49
2008 - 52

Class size major 1000 level
2012 - 33
2011 - 31.2
2010 - 29
2009 - 25.7
2008 - 33.3

Class size major 2000 level
2012 - 23.6
2011 - 20.4
2010 - 17.7
2009 - 18.3
2008 - 24.4

b. Student credit hours by level generated in all major courses that make up the degree program for five years.

Credit hours major courses - 1000 level
2012 - 7,026
2011 - 7,182
2010 - 6,261
2009 - 5,727
2008 - 7,863

Credit hours major courses - 2000 level
2012 - 3,291
2011 - 2,790
2010 - 2,730
2009 - 2,625
2008 - 3,744

c. Direct instructional cost for the program for the review period.

Oklahoma City Community College (OCCC) offers online courses (computer based/Internet) which allow students the freedom from attending regularly scheduled course meeting times while still earning college credit. Online courses are similar to traditional, on campus courses in that they have a regular class schedule, assignment due dates, and the expectation of student interaction. OCCC has committed resources for the creation of specialized resources for online students with the goal of increasing student success. These resources include a customized section of the OCCC website to assist them as they progress in their academic studies via distance and an orientation to the College's Learning Management System. We also provide virtual tutoring in the Math and Communication labs in addition to 24-7 tutor support through GradeResults to further customize and personalize online students' education. The cost of these initiatives and efforts totals $55,000.00. The cost of 24-7 technology support for student and faculty support those working within the learning management system is $65,000.00.

Technology use in the classroom continues to expand to meet the needs of our students. 150 of our classrooms are equipped with permanent multimedia equipment with the availability of mobile carts to increase the number of high tech classrooms to 100%. The cost incurred with this multiyear effort was $1.22 Million. Faculty members are continuing to utilize student response systems, SmartBoards, slates and are implementing the use of IPads within the classroom. OCCC continues to support the utilization of technology in the classroom so faculty can continue to engage students. The use of IPads in the classroom is a new effort on campus and the cost thus far has only been $50,000.00. The Center for Learning and Teaching offers multiple learning opportunities for faculty related to strategies for incorporating technology into instruction effectively as well as the use of the College's Learning Management System, Moodlerooms. The CLT team has strategically worked to meet the needs of our 157 full-time faculty as well as the 500 adjunct faculty members. They support them through organized workshops, online training modules, and individual faculty consultations conducted via phone, Skype, email, or in person. The consultations focus on the use of the college's LMS as well as the choosing of instructional technology to match learning objectives.

d. The number of credits and credit hours generated in the degree program that support the general education component and other major programs including certificates.

General Education credits = 786
Generated Credit hours = 2,525

e. A roster of faculty members including the number of full-time equivalent faculty in the specialized courses within the curriculum.

8 full-time faculty members:
Dr. James Bothwell
Dr. Haining Chen
Ms. Vicki Gibson
Mr. Al Heitkamper
Mr. Haifeng Ji
Ms. Sara Mathew
Ms. Anita Philipp
Ms. Mary Williams

f. If available, information about employment or advanced studies of graduates of the program over the past five years.

This is a transfer program, and by design, there is no job market data at this level of degree

completion. In meetings with OU and UCO CS faculty it is reported that in advanced studies OCCC students excel in the pursuit of their Bachelor degree.

g. If available, information about the success of students from this program who have transferred to another institution.

Institutional Effectiveness has provided support data obtained via surveys of OCCC Computer Science graduates from years 2008-2012. Graduates from each year were asked to indicate on a (1-5 scale through 2009, 1 - 10 beginning 2010) scale their preparation at OCCC for continuing their education. Average results from those responding to the survey for each year were:

2011 8.83
2010 7.83
2009 4.50
2008 4.00
2007 3.80

5. Duplication and Demand

a. Demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data.

We serve a number of traditional students, reverse transfer students, co-enrolled students at UCO, concurrent high school students, industry employees, military students, as well as people who are seeking a career transition.

b. Demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data.

10 hot careers for 2012 - and beyond
12/27/2011

http://management.fortune.cnn.com/2011/12/27/10-hot-careers-for-2012-and-beyond/

FORTUNE -- Strange but true: Despite the fact that unemployment is stuck at around 9%, which translates to about 15 million Americans out of work, nearly 3 million job openings in the U.S. are going unfilled, according to the Bureau of Labor Statistics. Why? The biggest reason is a mismatch between the qualifications employers are looking for and the skills job hunters have.

So which skills are most in demand? Here are 10 of the hottest:

Information technology. When career site Indeed.com recently analyzed millions of job postings on its web site, researchers found that the fastest-growing category of keywords -- including HTML5, Android, mobile app, and social media -- were in IT, and a new survey by tech job site Dice.com bears that out: About 65% of hiring managers said they hope to add tech staff in the first half of 2012. Roughly a quarter of those (27%) said they want to expand their IT headcount by more than 20%.

Openings for software developers who specialize in applications will rise by more than one-third (34%) by 2018, says Best Jobs for the 21st Century, a new book by job market analyst Laurence Shatkin, while companies will hire 20% more computer systems analysts. Rising pay in these fields reflects the surge in demand: The Bureau of Labor Statistics says that developers of systems software, for instance, earn an average of $94,180 per year.

CareerCast.com reports 10 Best & Worst Jobs in Oklahoma

http://www.adicio.com/2012-Best-Jobs-in-Oklahoma

Other top-rated jobs in Oklahoma include Software Engineers, Human Resources Managers, Civil Engineers and Physicians. And with consumers demanding a more digital world, job prospects for Software Engineers will continue to be hot.

“Opportunities for Software Engineers especially are growing two to three times faster than the overall economy in Oklahoma,” says Tony Lee, publisher, CareerCast.com. “The factors that make this profession so highly rated include a high salary, low on-the-job stress and strong job-growth potential.”

Network World Magazine published an article entitled "Top Ten Cloud Jobs". In the article it stated

Dice.com, the popular tech-focused job site, posts upwards of 3,800 cloud-related job listings on any given day. Researchers there crunched the numbers to come up with a list of the top 10 most available jobs in the cloud. These job descriptions and credentials were compiled using multiple job listings in each category. (Burns)

In reviewing the ten positions discussed in the article, seven required a BS degree in Computer

Science or Computer Engineering. Two required a degree in Business. One did not require a degree. Students working on the Computer Science AS degree with the CS option could earn a CS degree at the receiving four year institution. Similarly, students earning an AS degree with the MIS option could transfer to earn the Business degree. This is a definitely an area of potential employment for our graduates.

Burns, Christine. "Top 10 Cloud Jobs." *Network World*. 08 10 2012: n. page. Web. 10 Oct. 2012.

http://www.networkworld.com/slideshow/68518?source=NWWNLE_nlt_daily_am_2012-10-09>.

Faculty receive calls offering internships and job opportunities to CS students.

c. Demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting.

UCO CS Advisory board; InfraGard Advisory board; school board K-12 district; Introduction to Computers and Applications was taught on UCO campus; train the trainer in Secure Coding; National Center for Academic Excellence in Information Assurance for 2 year institutions; CAE2Y-NSA and Department of Homeland Security 5 year designation; collaborated with graduate students at University of South Africa on mobile device security; contract teaching for FAA.

d. Indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community.

Cyber/STEM summer camps were offered through College for Kids; participated in National Initiative for Cyber Security; Cyber Citizens forum for NSA; Day in the life of CS professionals with OU; Small Business Association meetings sponsored by NSA to talk about CS; and Oklahoma Cyber Security Conference.

e. The process of program review should address meeting demands through alternative forms of delivery.

Classes are offered in intersession, online, summer and Individual Paced formats; use of virtual machines; Internship in Data Mining; Utilize cloud computing; use video for extra reinforcement; Use of E-books and mobile computing; and taught a CS credit class at a high school.

6. Effective Use of Resources

The resources used for a program determine, in part, the quality of the educational experiences offered and program outcomes. Resources include financial support (state funds, grants and contracts, private funds, student financial aid); library collections; facilities including laboratory and computer equipment; support services; appropriate use of technology in the instructional design and delivery processes; and the human resources of faculty and staff. The efficiency of resources may be measured by cost per student credit hour; faculty/student ratio; and other measures as appropriate. The effective use of resources should be a major concern in evaluating programs. The resources allocated to the program should reflect the program's priority consistent with the institution's mission statement and academic plan.

Computer Science (AS, AAS and Certificate)

Program Average

FY 2010: 22 FTE Faculty
FY 2011: 24 FTE Faculty

FY 2012: 23 FTE Faculty

Average class size:
Class size major 1000 level
2012 - 33
2011 - 31.2
2010 - 29
2009 - 25.7
2008 - 33.3

Class size major 2000 level
2012 - 23.6
2011 - 20.4
2010 - 17.7
2009 - 18.3
2008 - 24.4

Average Credit hours:
Credit hours major courses - 1000 level
2012 - 7,026
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Credit hours major courses - 2000 level
2012 - 3,291
2011 - 2,790
2010 - 2,730
2009 - 2,625
2008 - 3,744

Courses taught - 1000 level
2012 - 71
2011 - 77
2010 - 72
2009 - 75
2008 - 79

Courses taught - 2000 level
2012 - 47
2011 - 46
2010 - 52
2009 - 49
2008 - 52

Eight full-time professors provide instruction in the curriculum. There are two unfilled positions. Professors teach 15 credit hours as a full-time load and may teach additional classes as adjuncts.

Approximately fifteen adjunct instructors are used each semester in the Computer Science department with each teaching one to two classes. Their credentials can be found in the Division of Information Technology office

The full-time faculty serve as lead teachers and mentors for the adjuncts.

There are 7 computer equipped classrooms used by the CS Department.

There is a Student Computer Center with 120 computers that is available for all OCCC students. For CS students we have 4 lab assistants and 1 Technician/lab assistant. Two Supplemental instructors and 11 tutors are also available. There is also a security lab, network lab and testing center adjacent to the Student Computer Center.

IV. Program Review Recommendations

This section is a description of recommendations that have been made as a result of the review and of actions that are planned to implement these recommendations. Recommendations should be clearly linked and supported by the information and analyses that were articulated in the previous sections and should contain a realistic strategy for implementation of any changes.

A. Describe the strengths of the program identified through this review.

Faculty: The current faculty have shown a consistent dedication to maintaining the excellence of the program and success of the students. They maintain a knowledge base in their area of expertise and demonstrate a flexibility to explore new emerging areas. Two new excellent CS faculty were hired.

Equipment: The hardware and software has consistently been the current state of the art in both the classrooms and labs. This ensures the students will be up to date when they graduate and enter the work force.

Student Computer Center: Continued use of the SCC has created a friendly, efficient location for students to continue the learning process outside of the classroom. Excellent lab tutors and supplemental instructors have been hired.

Schedules: The number of online classes has been increased due to student demand.

Recognition: We have been recognized as a National Center of Academic Excellence in Information Assurance.

Relationships: Close cooperation with UCO and OU Computer Science and Management Information Systems departments and individual faculty greatly enhances transfer opportunities for students.

B. Describe the concerns regarding the program that have been identified through this review.

Hiring faculty - salary not competitive with market exacerbated by nearly 50% of full time CS faculty eligible for retirement.

Many students don't have course materials at the beginning of class.

Faculty do not receive notification of the withdrawal of students, and this is detrimental to student retention/completion and program assessment.

Because the Student Computer Center is such an asset we feel we should support and encourage the lab employees by helping them maintain proficiency in subject areas.

A secure testing environment in the Student Computer Center Testing Center is an on-going concern.

C. Develop a list of recommendations for action that addresses each of the identified concerns and identify planned actions to implement recommendations.

Difficulty hiring faculty: Advertise the openings in more places, including online job sites. Explore other ways to encourage qualified applicants to consider OCCC. Explore ways of providing salaries competitive to business job market.

Student materials: Encourage a procedure on campus to allow students to obtain materials for class by first day of class.

Withdrawal reports: Faculty should receive email notification regarding withdrawals and reason for withdrawals.

Lab staff: Establish a system to use scheduled lab hours to have lab personnel sit in on a class at least once a year per faculty recommendation.

D. Provide institutional recommendations as the result of the program review and planned actions to implement recommendations.

1. Financial aid should be disbursed at or near the beginning of the semester so students can obtain materials, by the first day of class.
2. There should be a process in place to extend financial credit to students to purchase necessary classroom materials.

Appendix

Program Curriculum

Program Requirements

Minimum Required Hours 62

Major Courses		
Prefix & Number	Course Title	Credit Hours
CS 1143	Beginning Programming (CS, CIS, & MIS)	
CS 1353	Introduction to Operating Systems and Hardware (CIS)	
CS 2113	Computer-Based Information Systems (MIS)	
CS 2163	Java (CS & CIS)	
CS 2173	Oracle (CIS)	
CS 2363	C++ (CS)	
CS 2443	SQL Server (CIS)	
CS 2453	Visual Basic (CS & MIS)	
CS 2463	Advanced Java (CS & MIS)	
CS 2553	Advanced Visual Basic (CS)	
CS 2563	C# (CS)	
CS 2713	Principles of Information Security (CIS)	
CS 2743	Enterprise Security Management (CIS)	
CS	Computer Science Elective (CIS)	
	Computer Science 12-15 hours	
	Management Information System 9 hours	
	Cyber/Information Security 23 hours	

General Education Courses		
Prefix & Number	Course Title	Credit Hours
ENGL 1113	English Composition I (CS, CIS & MIS)	
ENGL 1213	English Composition II (CS, CIS & MIS)	
COM 1123	Interpersonal Communications (CIS)	
COM 2213	Intro to Public Speaking (CS & CIS	
BUS 2033	Business Communication (CS)	
POLSC 1113	American Federal Government (CS, CIS & MIS)	
HIST 1483	U.S. History to the Civil War --OR	
HIST 1493	U.S. History Since the Civil War (CS, CIS & MIS)	
PSY 1113	Introduction to Psychology (CS, CIS & MIS)	
SOC 1113	Introduction to Sociology (CIS & MIS)	
MATH 1503	Contemporary Mathematics (CS)	
MATH 1513	College Algebra (CIS & MIS)	
MATH 1533	Pre-Calculus and Analytic Geometry (CS)	
MATH 1613	Trigonometry (CS)	
MATH 1743	Calculus I for Business, Life Sciences and Social Sciences (MIS)	
MATH 2104	Calculus and Analytic Geometry I (CS)	
MATH 2214	Calculus and Analytic Geometry II (CS)	
MATH 2314	Calculus and Analytic Geometry III (CS)	
PHYS 2014	Engineering Physics I (CS)	
PHYS 2114	Engineering Physics II (CS)	
PHYS SC	Physical Science chosen from ASTR, PHYS, CHEM	
	or GEOL prefixes (CS, CIS & MIS)	
CS 1103	Introduction to Computers and Applications (CIS & MIS)	
CHEM 1115	Chemistry I (CS)	
	Humanities (CS & MIS)	
	Any Biological Science except BIO1013 (CS & MIS)	
BIO 1114	General Biology (Non-Majors) (CIS)	
PHIL 1213	Introduction to Ethics (CIS)	
PHIL 1603	Introduction to Logic (CIS)	
	Computer Science 45-49 hours	
	Management Information Systems 37 hours	
	Cyber/Information Security 38 hours	

Support Courses		
Prefix & Number	Course Title	Credit Hours
	Elective (CS)	
ACCT 2113	Accounting I/Financial (MIS)	
ACCT 2123	Accounting II/Managerial (MIS)	
ECON 2123	Principles of Microeconomics (MIS)	
ECON 2143	Principles of Macroeconomics (MIS)	
MATH 2123	Calculus II for Business, Life Sciences and	
	Social Sciences (MIS)--OR	
BUS 2023	Business Statistics (MIS)	
	Computer Science 0-1 hours	
	Management Information Systems 15 hours	
	Cyber/Information Security 0 hours	

Life Skills Courses		
Prefix & Number	Course Title	Credit Hours
SCL 1001	Success in College and Life	1