Oklahoma City Community College

Program Review Self Study Year: 2012-2013	
Division of Information Technology	
Associate in Applied Science in Computer Science (052) Options: Computer System Support Web Design and Development Cyber/Information Security Database Computer Programming Certificate of Mastery in Network Technician (121) Certificate of Mastery in Computer Systems Support (122) Certificate of Mastery in Cyber/Information Security (139) Certificate of Mastery in Web Development (149) Certificate of Mastery in Web Design (150)	
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 Budget Process: The three year replacement cycle is no longer in effect for computer hardware.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 faculty of the Computer Science Department believes that the continued development and implementation of the Program is an integral part of the growth and purpose of the College. The program exists to serve the educational and career needs of the citizens and employers in the community. The Computer Science faculty has the responsibility to assure employers that they are getting potential employees who are detail-oriented, competent, creative, eager to problem-solve and dedicated to staying current in the field. Our ultimate responsibility is to assist students to grow and learn as unique individuals, active citizens of the community, and as competent computer professionals.

Strengths

Faculty: The current faculty has 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 insures 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 have been increased due to demand by students.

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

Relationships: Close cooperation with OSU/IT. We have a Microsoft Academic Alliance, Oracle Academy, CompTIA Academic Academy, Cyber Watch, CSEC, and are affiliated with three National Advanced Technology Education Centers funded through the NSF.

Credit for IT Industry certifications: Advanced standing college credit may be awarded by Oklahoma City Community College for individuals who achieve a passing score on selected industry certification examinations.

Concerns

The hiring of faculty is a concern for this program. Salaries are not competitive with market exacerbated by over 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 faculty of the Computer Science Department believes that the continued development and implementation of the Program is an integral part of the growth and purpose of the College. The program exists to serve the educational and career needs of the citizens and employers in the community. The Computer Science faculty has the responsibility to assure employers that they are getting potential employees who are detail-oriented, competent, creative, eager to problem-solve and dedicated to staying current in the field. Our ultimate responsibility is to assist students to grow and learn as unique individuals, active citizens of the community, and as competent computer professionals.

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: Computer applications, Introductory computer course, Database, Computer security, and College level Math. All options must have 61 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 demonstrate an understanding of the Confidentiality, Integrity, and Availability (CIA) triangle as it relates to information security. (FY08)
- Students will be able to install, configure and upgrade computer hardware components. (FY10)
- 3. Students will be able to install, configure and maintain computer operating systems and software. (FY 11)
- 4. Students will be able to diagnose and troubleshoot common hardware and operating systems problems associated with a computer. (FY 12)
- 5. Students will demonstrate an understanding of basic network concepts and terminology. (FY 09)
- 6. Students will write XHTML code to create external, internal, and e-mail hyper links in a web page. (FY 09)

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

Outcome 1. Students in CS 2713 - Principles of Information Security will be assessed on their understanding of the CIA triangle by completing a paper outlining the components of the triangle and the affect non-compliance has on the information security of an organization. At least 70% of the students assessed will demonstrate understanding by scoring 70% or more on the measured competency.

Outcome 2. Students in CS 1353 - Introduction to Operating Systems and Hardware will be assessed on their ability to install, configure and upgrade computer hardware components.. 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. Students in CS 2183 - Linux course will be assessed on their performance on a given problem requiring them to perform operations including installation, configuration and maintenance for computer operating systems and software. At least 70% of assessed students will perform at a minimum of 70% level on the assessment.

Outcome 4. Students in CS 1353 - Introduction to Operating Systems and Hardware will be assessed on their performance on a given problem requiring them to diagnose and troubleshoot common hardware and operating systems problems associated with a computer. At least 70% of assessed students will perform at a minimum of 70% level on the assessment.

Outcome 5. Students in CS 2303 - Networking Technologies will be assessed on their knowledge of basic network concepts and terminology using a written test. 70% of students assessed will perform at an acceptable level (70%) or higher on the assessment.

Outcome 6. Students in CS 2413 - Web Site Development will be assessed on their performance

on creating a web page that includes external, internal and email links. 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. 30 students in two sections (1 online, 1 on-campus) of CS2713 were assessed. 87.5 % (14 of 16) of the on-campus students assessed demonstrated proficiency by scoring 70% or more on the measured competency. 85.7 % (12 of 14) of the online students assessed demonstrated proficiency by scoring 70% or more on the measured competency. The current course structure is an appropriate way to teach this concept.

Outcome 2. 17 students out of 18 in CS 1353 (94%) were successfully able to install, configure and upgrade computer hardware components at above a 70% level. The data suggests that we should continue using the current method of instruction.

Outcome 3. 24 students in CS 2183 were assessed. 87.5% (21) of the students assessed were successfully able to install, configure, and maintain computer operating system and software. We will continue to use the assignment of installing configuring and maintaining computer operating system to assess the students' capability, since it is an important skill required in this course. The assignment helped students to develop this skill set.

Outcome 4. 11 students in CS1353 were assessed. 82% (9) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. The data suggests that we should continue using the current method of instruction.

Outcome 5. 15 students in CS 2303 were assessed. 80 % (12 of 15) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. The current course structure is an appropriate way to teach these concepts.

Outcome 6. 36 students of CS2413 were assessed. 95 % (34 of 36) of the students assessed demonstrated proficiency by scoring 70% or more on the measured competency. The current course structure is an appropriate way to teach these concepts.

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 department has an annual Advisory Committee meeting to get input and feedback from IT industry. Regular participation in the General Education Committee.

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. 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.

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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.

Even though not designed for transfer, all degrees will transfer to a Bachelor of Technology or Computer Science Applied degree The Cyber Security degree transferred to OSU/IT.

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 from Advisory Committee meetings from industry members. 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 - AAS - 19; Cert. - 45 2011 - AAS - 22; Cert. - 38 2010 - AAS - 22; Cert. - 50 2009 - AAS - 27; Cert. - 55 2008 - AAS - 23; Cert. - 22 Five year average for AAS 22.6, Certificates 42

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

2012 - AAS - 315; Cert. - 164 2011 - AAS - 361; Cert. - 167 2010 - AAS - 395; Cert. - 126 2009 - AAS - 343; Cert. - 92 2008 - AAS - 360; Cert. - 80 Five year average for AAS 354.8; Certificates 125.8

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 = 324 Generated Credit hours - 972

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.

Students are currently working in the community at Hertz, Dell, FAA, Tinker Air Force Base, Integris

Hospital, state agencies, and the energy industry. Students are currently enrolled at UCO, OU, OSU/IT, OSU and OCU.

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 8.17 2010 no data provided by IE 2009 4.67 2008 3.50 2007 3.67

- 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 and OU, 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.

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.

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; and contract teaching for FAA.

d. Indirect demands in the form of faculty and student contributions to the cultural life and wellbeing 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 intercession, 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: 7.9 FTE Faculty FY 2011: 7.9 FTE Faculty FY 2012: 7.4 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 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 Courses taught - 1000 level 2012 - 71

2009 - 75 2008 - 79 Courses taught - 2000 level 2012 - 47 2011 - 46 2010 - 52 2009 - 49 2008 - 52

2011 - 77 2010 - 72

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 has 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 insures 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 have been increased due to demand by students.

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

Relationships: Close cooperation with OSU/IT. We have a Microsoft Academic Alliance, Oracle Academy, CompTIA Academic Academy, VMware Academy, Cyber Watch, CSEC, and are affiliated with three National Advanced Technology Education Centers funded through the NSF.

Credit for IT Industry certifications: Advanced standing college credit may be awarded by Oklahoma City Community College for individuals who achieve a passing score on selected industry certification examinations. These certifications, the number of credit hours awarded and the class for which credit is awarded include:

Microsoft MOS Access (Proficient), 3, CS 1333-Database Management Applications

Microsoft MOS Excel (Proficient), 3, CS 1343-Spreadsheet Applications

Microsoft MOS Excel (Expert), 3, CS 1343-Spreadsheet Applications

CompTIA A+ Certification, 3, CS 1353-Intro to Operating Systems & Hardware

Microsoft Supporting Windows 2000/XP/Vista, 3, CS 2153-Supporting Operating Systems

CompTIA LINUX+, 3 ,CS 2183-LINUX

Microsoft Networking Essentials, 3, CS 2303-Networking Technologies

CompTIA Network+, 3, CS 2303-Networking Technologies

Microsoft Windows 2003/8 Server Administration, 3, CS 2503-Network Administration

CompTIA Security+, 3, CS 2713-Principles of Information Security

SCP SCNS, 3 ,CS 2713-Principles of Information Security

SCP SCNP, 3, CS 2763-Network Security

SCP SCNA, 3, CS 2763-Network Security and CS 2743-Enterprise Security Management

CIW Security Professional, 3, CS 2723-Secure Electronic Commerce

EC-Council CEH or CHFI, 3, CS 2783-Cyber Forensics

Oracle Database 11g Administrator Certified Associate, 3, CS 2173-Oracle and CS 2573-Oracle Database Administration

Oracle Database 10g Administrator Certified Associate, 3, CS 2573-Oracle Database Administration

Oracle9i Database Administrator, 3, CS 2173-Oracle

Oracle PL/SQL Developer Certified Associate, 3, CS 2173-Oracle

Oracle Forms Developer Certified Professional, 3, CS 2173-Oracle

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.
- 2. There should be a process in place to extend credit to students to purchase necessary classroom materials.

Appendix

Program Curriculum

Program Requirements

Minimum Required Hours

Major Courses		
Prefix & Number	Course Title	Credit Hours
CS 1143	Beginning Programming (CP, CIS, WDD, D)	3
CS 1153	Introduction to Computing Technologies (CSS, CIS)	3
CS 1333	Database Management Applications (CSS, CIS, WDD, D)	3
CS 1353	Introduction to Operating Systems and Hardware (CSS, CIS, D)	3
CS 1413	IT Technician (CSS)	3
CS 2113	Computer-based Information Systems (CP)	3
CS 2153	Supporting Operating Systems (CSS)	3
CS 2163	Java (CP, WDD, D)	3
CS 2173	Oracle or (CP, CIS, WDD, D)	3
CS 2183	Linux (CSS, CIS, WDD, D)	3
CS 2303	Networking Technologies (CSS, CIS)	3
CS 2363	C++ (CP)	3
CS 2403	Computer Support Services (CSS)	3
CS 2413	Web Site Development (CP, WDD	3
CS 2443	SQL Server (CP, CIS, WDD, D)	3
CS 2453	Visual Basic (CP, WDD, D)	3
CS 2463	Advanced Java (CP, D)	3
CS 2503	Network Administration (CSS, CIS, D)	3
CS 2513	Client-side Programming (CP, WDD)	3
CS 2563	C# (CP, D)	3
CS 2623	Server-side Programming (CP, WDD)	3
CS 2713	Principles of Information Security (CP, CSS, CIS, D)	3
CS 2723	Secure Electronic Commerce (CIS, WDD)	3
CS 2743	Enterprise Security Management (CIS)	3
CS 2763	Network Security (CSS, CIS)	3
CS 2783	Cyber Forensics (CIS)	3
CS 1363	Digital Media Development (WDD)	3
CAT 1513	Digital Imaging (WDD)	3
CS 1103	Introduction to Computers and Applications (D)	3
CS 2223	Systems Analysis and Design (D)	3
CS 2553	Advanced Visual Basic (D)	3
CS 2573	Oracle Database Administration (D)	3
CS	Elective (D)	3
D= Database	CSS= Computer System Support CP=Computer Programming	
	CIS=Cyber/Information Security WDD=Web Design/Development	

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General Education Courses			
Prefix & Number	Course Title	Credit Hours	
CS 1103	Introduction to Computers and Applications (CP, CSS, WDD, CIS)	3	
ENGL 1113	English Composition I (CP, CSS, WDD, CIS, D)	3	
COM 2213	Introduction to Public Speaking or (CP, CSS, WDD, CIS, D)		
ENGL 1213	English Composition II or (CP, CSS, WDD, CIS, D)		
ENGL 1233	Report Writing or (CP, CSS, WDD, CIS, D)		
COM 1123	Interpersonal Communications (CP, CSS, WDD, CIS, D)	3	
MATH 1503	Contemporary Mathematics (CSS, WDD, CIS, D)	3	
MATH 1513	College Algebra (CP, CIS)	3	
POLSC 1113	American Federal Government (CP, CSS, WDD, CIS, D)	3	
HIST 1483	US History to the Civil War or (CP, CSS, WDD, CIS, D)		
HIST 1493	US History since the Civil War (CP, CSS, WDD, CIS, D)	3	
PHYS 1014	Physical Science (D)	3	

Support Courses			
Prefix & Number	Course Title	Credit Hours	
CS	Computer Science elective (CP, CSS)	3	

Life Skills Courses				
Prefix & Number	Course Title	Credit Hours		
SCL 1001	Success in College and Life (CSS, WDD, CIS, CP, D)	1		

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