

Oklahoma City Community College

Program Review Self-Study Year: FY 2018
Division of: Business and Information Technology
Associate in Applied Science in Computer-Aided Technology (011) Options: Computer-Aided Design Geographic Information System Unmanned Vehicle System Certificate of Mastery in Computer-Aided Design (084) Certificate of Mastery in Geographic Information Systems (151) Certificate of Mastery in Unmanned Aerial Systems (174)
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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.

<p>The program completed a standard program review five years ago, and these were the recommendations at that time. Because of the various changes at the college and within the program, some of the recommendations are no longer pertinent to this review.</p> <p>How were recommendations addressed in the standard program review?</p> <ol style="list-style-type: none">1. The numbers of students in some options have decreased while others have increased.<ol style="list-style-type: none">a. Since the last review, the Game Design, Computer Animation, and Digital Media Design options were moved to another program. Game Design and Computer Animation were eventually deleted.b. The program is promoted on the campus-wide television and has been promoted in the college newspaper.c. Degree sheets have been updated and are distributed on career days and campus visits.d. The faculty attend multiple career days each year promoting the program.2. Lack of exposure and promotion of the program.<ol style="list-style-type: none">a. The college has not promoted individual programs in the past but will start doing more promoting of individual programs.3. Outdated equipment in the AV Studio.<ol style="list-style-type: none">a. The AV software and equipment were updated.

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-Aided Technology program fits well with the college's mission of providing education and training leading directly to employment in the field of study. Students are successful in technical or professional careers.

The Computer-Aided Technology Program (CAT) has gone through some major changes since the last program review. Three options have been moved to the Digital Media Department, and a new option was created in the anticipation of unmanned aircrafts (drones).

The Computer-Aided Technology Program has a strong history of successful graduates, many of whom have continued their education to become engineers, architects, interior designers, graphic designers, and technology center instructors.

Program strengths include an experienced and knowledgeable faculty, a curriculum that keeps pace with current trends and technology currently used in the profession, state-of-the-art facilities, flexible scheduling, and willingness to adapt when necessary.

Program evaluation is an ongoing process that examines data and feedback from multiple sources, including advisory board members, exit interviews, employer feedback, and current students.

The overall enrollment in the program is down. Recruitment efforts will need to be stepped up to compensate for this fluctuation.

Projected Goals:

- Continue recruitment and advisement opportunities.
- Develop recruitment efforts to educate potential students about careers in Computer-Aided Technology.
- Increase visibility within the college and the community.
- Work more closely with business and industry.

Faculty and staff are currently working on the following recruitment efforts:

- Dean Claybon, Adjunct Professor Dr. Todd Fagin, and Professor Helton will be meeting with faculty from the University of Oklahoma's Department of Geography and Environmental Sustainability (DGES) to discuss a 2+2 agreement in GIS.
- Faculty from the CAT department participated in the first annual STEM night with Hillcrest Elementary School on March 29, 2018. The STEM night was coordinated by Yolanda Alexander-Scott, the STEM Outreach Coordinator. The CAT department will continue to work with Ms. Alexander-Scott in the development of the STEM night to include more activities from Computer Science and Computer-Aided Technology departments.

- Faculty and staff will be assisting in several summer camps to promote STEM education. Professor Helton will be teaching a course in Drones and 3D Fabrication. Mr. Gary Dominguez will be teaching a course in 3D Design.
- The Business and Information Technology Division will be planning an open house for the fall. The goal of the open house is to promote programs and facilities to the community, future students, and business leaders.
- Faculty and staff plan to participate in more career fairs and events. Each year, faculty participate in the Southeast High School Career Fair and the OKC Public Schools' Eighth Grade Career Fair.
- Faculty are planning "Lunch and Learn" sessions on the first Thursday of each month, where representatives from business and industry could talk with students about internships and employment opportunities. This event would be open to all students.

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-Aided Technology program at OCCC provides a high-quality education to students wishing to join the workforce after the completion of an AAS degree or certificate of mastery.

The Computer-Aided Technology program is central to at least two points of OCCC's mission statement.

- **Student Success:** Students successfully complete their academic courses, persist in college, and earn certificates or degrees at OCCC or another institution.
- **Graduate Success:** Graduates go on to earn higher-level degrees or are successful in technical or professional careers.

There is a diverse group of students taking courses in the Computer-Aided Technology program. The program's primary students are those working toward an AAS or certificate in Computer-Aided Technology. Students in Engineering Technology take courses as requirements of their degree plan. Students in Engineering can take courses within Computer-Aided Technology as electives in their program of study. There are engineering students from the University of Oklahoma taking courses as prerequisites or electives in their program of study. Lastly, there are working adults taking courses to enhance their skills.

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

CAT Mission Statement:

The Computer-Aided Technology Program will provide the state of Oklahoma with professionals using application software in traditional and non-traditional technologies, such as engineering and architectural design, GIS, and UAS. Students graduating from the CAT department at Oklahoma City Community College will:

- Be able to continue to learn and to adapt in a world of constantly changing technology.
- Be prepared for an entry-level position in their field of study.
- Use the latest equipment and software used in industry.

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.

- Ability to use a computer graphic system to create industry specific 2D drawings.
- Ability to use a computer graphic system to create raster and vector graphics.
- Ability to use a computer graphic system to integrate graphics and data from multiple sources.
- Ability to use the concepts, techniques, and skills of 3D Modeling and analysis.
- Ability to use the concepts, techniques, and skills of computer programming and scripting.
- Ability to apply basic physics and mathematical techniques to analyze coplanar force systems, calculate moments of inertia, compare stresses in structural and mechanical systems, and apply basic properties of materials in the selection of structural members.
- Ability to use a computer graphic system to develop a solution to an industry specific problem.

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

The Computer-Aided Technology program uses several methods of measuring the success of the program and student success. Each learner outcome or program outcome is measured at least twice in a five-year period. The criteria used for each outcome is decided on by faculty and used as a baseline for improving the program. For the 1000-level courses, rubrics are created for measuring learner success for that outcome. Rubrics are also used for the 2000-level courses in addition to surveys to measure the program success.

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

Each year, the CAT program uses the outcomes assessment data to improve the quality of the program. Based on recommendations, some of the modifications made to specific courses, the facility, or a degree option are listed below:

2017

Outcome: Ability to use the concepts, techniques, and skills of 3D Modeling and analysis.

Summary: It was determined that 37% of students in CAT 1043 had difficulty building a 3D parametric part accurately and were not able to determine the mass, volume, and surface area of the part.

Recommendation: More emphasis will be placed on correctly designing in 3D during class. Students will be given more practice problems prior to the exam.

Summary: Seventy percent of students who take the Solidworks CSWA national certification exam will pass the exam. To pass the exam successfully, students must be able to obtain mass, volume, and surface area of the part. During the fall 2016 term, 6 out of 16 students passed the CSWA exam. In spring 2017, 11 out of 15 students passed the exam. The percent passing rate increased from 38% to 73% during the year.

Recommendation: Students will be encouraged to spend more time working on the practice problems outside of the classroom.

2016

Outcome: Ability to use a computer graphic system to create industry specific 2D drawings.

Summary: Forty-six student projects were reviewed. These students were enrolled in the CAT 1214 course during the spring, fall, and summer. The average score on the assessment was 89%. Two areas of weakness have been identified: (1) Dimension style setup and placement of dimensions, (2) Annotation size and placement.

Recommendation: Changes will be made in the lessons and lectures of CAT 1214 and CAT 1043 over dimensioning and annotation.

2015

Objective: Ability to use a computer graphic system to integrate graphics and data from multiple sources.

Summary: Ninety-seven students finished the CAT 1214 course during the spring, fall, and summer. There were 17 students who didn't submit their assignments. The average grade for this module was 75% if the 0 grades are included and 92% if they are not included. Two areas of weakness have been identified based on instructor's notes and grading.

Several of the students had issues with the draw order feature, objects that should have been in the back, and were in front of other objects.

More emphasis should be placed on the different types of file paths and how to correct them.

Recommendation: Changes in the lessons should be made to address these areas.

2013

Objective: Ability to use a computer graphic system to integrate graphics and data from multiple sources.

Summary: Thirty-eight drawings were evaluated with the average score on the Boeing 787 assignment being an 88% and the average score on the Site Map assignment being 78%.

Recommendation: During lecture and demonstrations, more emphasis will be placed on tracing line work, layer management, and annotative text.

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.

- Human Heritage, Culture, and Institutions
- Public Speaking
- Writing
- Mathematical Methods
- Critical Thinking

Strategy:

The General Education Committee will create five 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 35 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.

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 pre-existing 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 administered by our professional faculty at OCCC.

Data Collection:

The Office of Institutional Effectiveness will identify each semester students completing at least 35 credit hours in General Education Courses.

Program Response to General Education Assessment Data

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. All programs (terminal or transfer) to be evaluated contain at least 18 general education hours within the curriculum. OCCC has five general education learning outcomes that we expect all of our students to be proficient in upon graduation, they are: human heritage, culture, and institutions; writing; public speaking; mathematical methods; and critical thinking. Provide evidence that shows your participation in submission of artifacts, what types of artifacts are being submitted, and how you have used the general education assessment data to inform curricular refinement and to achieve these general education outcomes in your students in your program.

All options in the CAT program have at least 18 hours of general education courses. The program also supports general education assessment by providing artifacts to the general education committee, including videotaped presentations during Capstone presentations, research papers, sample test questions, sample assignments, and article reviews.

All Computer-Aided Technology courses incorporate writing, mathematical methods, and critical thinking within the curriculum. The following courses have a public speaking component within the course: CAT 1113, CAT 1313, CAT 1323, CAT 2163, CAT 2313, and CAT 2924.

- 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 you and your dean in identifying ways to improve instruction.

Students will receive an email during the 6th and 7th week for the first 8- week classes, and during the 14th and 15th week for the second 8-week/16-week courses and 16-week c. The email will include the information to evaluate each course. The window for replying to these surveys will be closed at the end of the designated weeks. Faculty will not have access to their SII results until after grades have been turned in.

- c. The program creates effective learning environment.

In addition to classroom learning, the CAT program has tutors available to students. The students also have access to the Student Computer Center and lab assistants. The CAT program has over 5,000 square feet of learning space that includes the following:

The Student Computer Center (4,000 sq. ft.) is located on the third floor of the OCCC Library. The Student Computer Center is open to all students during the fall, spring, and summer semesters from 7:30 a.m. to 9:00 p.m. on Monday through Thursday, 7:30 a.m. to 5:00 p.m. on Friday, and 8:00 a.m. to 4:45 p.m. on Saturday. The Student Computer Center is open in the weeks between the semesters but on a reduced schedule.

The Student Computer Center has 90 computers for general use and 23 high-end workstations for CAD with 32 GB of RAM and a 24" Monitor, and all software necessary to support the courses remains installed on these computers.

Students have access to a number of printers and plotters. These include:

- HP Designjet T1120 44" wide plotter with 44" wide scanner
- HP Designjet 75000 44" wide plotter
- Two HP 8150 LaserJet (B&W) for plotting up to 11x17 sheets.
- Several HP Designjet lasers printers

TechLab2 is located on the third floor of the OCCC Library. The 190 square foot room is equipped with six 3D Printers, a Roland desktop CNC machine, and a computer connected to the Fuel 3D Scanner.

TechLab1 room is located on the third floor of the OCCC Library. The 150 square foot room is equipped with a Full Spectrum Laser Cutter and metrology workbench.

The following equipment has been purchased for the metrology lab (TechLab1) from internal grant funds:

12" Transfer Stand, Bench Center - 15" center, Depth gauges, Digital Caliper, Digital/Mechanical Micrometer Drill gauge (1/16 to 1/2), Drill gauge (A to Z) , Electronic Digital (Dial) Indicator, Electronic Digital Micrometer, Gauge block set grade B (81 pieces), Height gauges, Inspection Block Levels - 8"-Sensitivity per 10" inch, Inspection Sine Bars 1 x 10-3/4 x 1", Magnetic Base/Indicator Holder Pin Gauges (.25 in - .50 in) in .001, Portable Hardness Tester, Pro 3600 Digital Protractor, Radius gauge, Screw Pitch gauge, Sets with Horizontal Type Indicators, Small Hole gauges, Steel Table Workbench/Storage, Student Tool set (inch) with case, Student Tool set (Millimeter) with case*, Surface Plate (tool grade B) 24X24, Telescoping Gauge set, Test Block Kit - Hardness: 30-90, Test Indicators - Horizontal Type, Universal Bevel Protractor with Dial & Mike Readings, V-Blocks and Clamps.

The GPS\Surveying Equipment is located in a locked storage cabinet in room 201. The equipment was purchased in 2007 through an internal grant. The equipment includes a Nikon Total Station, 18 handheld Trimble GPS units, 2 TDS Recon Data Collectors and various tools used in Surveying and GIS.

Unmanned Vehicle System Equipment is stored in room 201 and 301. The following equipment has been purchased with Carl Perkins Funds. The equipment includes several DJI and Parrot drones, an Aquabotix HydroView Sport Remote-Controlled Underwater Vehicle, Telepresence office robot Robot Create® 2 Robot, Parrot Jumping Sumo, and Genibo Robot Dog.

All CAT courses are taught in Library classroom 201. The room is approximately 1,300 sq. and equipped with an HD projection system and AV equipment. The classroom has 21 high-end workstations with 32 GB of RAM and two 24" Monitors.

The CAT program has access to **industry standard software** which includes:

- Site licenses for all Autodesk software, including AutoCAD, 3D Studio Max, Revit, Inventor Professional, Fusion 360, and many more.
- Site License for ArcGIS.
- Solidworks (45 seats).
- Site License for Adobe Creative Suite.
- Zbrush (21 seats)

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

Instruction and Reference

Reference librarians (currently 3.5 FTE) provide instruction and reference assistance to OCCC students. In the past two years, the number of librarian positions decreased from 6.5 to 4.5 positions, including one that is currently vacant. Many students receive hands on instruction for using library resources and selecting and evaluating sources as part of the required Success in College and Life course. Additional instruction is also provided to a variety of other classes, with a focus on the appropriate resources for that discipline or a specified assignment.

Librarians are available at the Library Assistance Desk 40 hours per week, a decrease from 65 hours two years ago. Students may also request additional research help outside those hours. Video tutorials and LibGuides on the Library's website supplement instruction by providing guidance for students who are off campus.

Online and Print Resources

Librarians select and purchase computer science and Computer-Aided Technology related materials, as well as maintain a broad collection of resources to support the overall OCCC curriculum. Students use library-provided resources in many of their Gen Ed courses, as well as occasional research related to specific CAT course projects. The collection includes materials on principles of computer aided design, manufacturing, structural design, GIS, drones, Autodesk Revit, AutoCAD, and more. The collection is weeded periodically to maintain currency. Ebooks are also purchased to provide alternative formats and as options for off campus access.

Course textbooks are available at the Library Circulation Desk for in-library use. Texts for the CAT courses are well utilized.

Some print periodicals have been retained, though electronic periodicals make up the bulk of the periodical collection. Students can utilize *EBSCOhost* to find computer science related articles, specifically within the *Computer Source* database and the multidisciplinary databases *MasterFILE Premier* and *Academic Search Premier*. Students can also utilize many other database options within *EBSCOhost* to find resources supporting CAT and general education courses.

Streaming academic and scholarly videos are available through *Films on Demand*, and documentary and feature films are offered through *Swank Digital Campus*. Both resources are utilized on and off campus by both faculty and students. Another tool is *ImageQuest*, a database of millions of copyright-cleared images for student and faculty projects and presentations.

The Library also strives to support the professional development of faculty. The book collection is updated with materials on teaching, learning, classroom technology and curriculum development. Additionally, the *Education Source* and *Professional Development Collection* databases, available via *EBSCOhost*, provides faculty access to periodical literature on teaching.

In summary, the Library supports this program comprehensively and appropriately.

- 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.

Computer-Aided Technology is an Associate in Applied Science degree and Certificate of Mastery program designed for the workforce, but program faculty will work with technology centers to determine if there is a possibility of direct transfer opportunities for students to earn credits.

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

The Computer-Aided Technology department has added new options and modified existing options based on recommendations of the advisory boards. The Unmanned Vehicle System option was added on the anticipation of the FAA changing the regulations of drones. Three options were moved to the Digital Media Design Department. Computer Animation and Game Design were eventually removed.

The Computer-Aided Technology department has provided a flexible scheduling of courses based on the needs of the students. Faculty try to develop a schedule so that students do not have to drive to campus four or five days a week. Day courses are two days a week, and evening courses are one night a week.

Students who have graduated from the CAT program frequently return and suggest changes to the program and courses.

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)

In 2006, OCCC requested that the name of Computer-Aided Design be changed to Computer-Aided Technology. Options and emphases have also changed in Computer-Aided Technology. Game Design and Computer Animation in Computer-Aided Technology were merged in the Graphic Communication program in FY 2016 and eventually deleted. The Digital Media Design and Multimedia options were deleted from the CAT program. The data below are the composite data from taught-out Computer-Aided Design options/emphases and then Computer-Aided Technology over the last five years:

Total AAS and Certificate:

FY 2013: 28

FY 2014: 31

FY 2015: 35

FY 2016: 38

FY 2017: 22

Five-year average = 30.8

Total AAS:

FY 2013: 15

FY 2014: 18

FY 2015: 6

FY 2016: 12

FY 2017: 10

Five-year average = 12.2

Total Certificate:

FY 2013: 13

FY 2014: 13

FY 2015: 29

FY 2016: 26

FY 2017: 12

Five-year average = 18.6

FY13 FY14 FY15 FY16 FY17

<u>Computer-Aided Design</u>	9	14	22	27	15
AAS CAT/Computer-Aided Design Emphasis	4	6	2	6	6
AAS Computer-Aided Technology/Multimedia Emphasis	0	1	0	0	0
CAD/Drafting Cert	0	0	0	0	0
CAD/Multimedia Emphasis AAS	0	0	0	0	0
CAD/Multimedia Emphasis Certificate	0	0	0	0	0
CAD-Manufacturing/Architectural Emphasis AAS	0	0	0	0	0
CAT/Multimedia Cert	0	1	0	0	0
Certificate CAT/Computer Aided Design	5	6	20	21	9
<u>Computer-Aided Technology</u>	19	17	13	11	7
AAS CAT/Animation	0	4	0	2	1
AAS CAT/Digital Media Design	0	1	0	0	1
AAS CAT/Geographic Information System	1	1	0	2	0
AAS COMPUTER-AIDED DESIGN/GAME DESIGN	9	5	4	2	2
AAS CAT/Multimedia Emphasis	1	0	0	0	0
Certificate Computer Aided Tech/Geographic Info System	4	1	3	3	1
Certificate Computer Aided Technology/Animation	0	3	1	1	1
Certificate Computer Aided Technology/DMD	0	0	1	0	0
Certificate Computer Aided Technology/Game Design	4	2	4	1	1

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

In 2006, OCCC requested that the name of Computer-Aided Design be changed to Computer-Aided Technology. Options and emphases have also changed in Computer-Aided Technology. Game Design and Computer Animation in Computer-Aided Technology were merged in the Graphic Communication program in FY 2016 and eventually deleted. The Digital Media Design and Multimedia options were deleted from the CAT program. The data below are the composite data from taught-out Computer-Aided Design options/emphases and then Computer-Aided Technology over the last five years:

Total AAS and Certificate:

FY 2013: 61

FY 2014: 54

FY 2015: 31

FY 2016: 9

FY 2017: 7

Five-year average = 32.4

Total AAS:

FY 2013: 56

FY 2014: 45

FY 2015: 25

FY 2016: 8

FY 2017: 6

Five-year average = 28

Total Certificate:

FY 2013: 5

FY 2014: 9

FY 2015: 6

FY 2016: 1

FY 2017: 1

Five-year average = 4.4

	FY13	FY14	FY15	FY16	FY17
AAS CAT/Computer-Aided Design Emphasis	10	6	13	6	6
AAS CAT/Multimedia Emphasis	0	0	0	0	0
CAT/Multimedia Cert	0	0	0	0	0
Certificate CAT/Computer Aided Design	3	3	2	1	0

AAS CAT/Animation	5	7	3	0	0
AAS CAT/Digital Media Design	8	3	0	0	0
AAS CAT/GIS	4	4	1	2	0
AAS COMPUTER-AIDED DESIGN/GAME DESIGN	29	25	8	0	0
Certificate CAT/GIS	0	2	3	0	1
Certificate CAT/Animation	0	1	0	0	0
Certificate CAT/DMD	2	0	0	0	0
Certificate CAT/Game Design	0	3	1	0	0

4. Successful Course Completion

a. Report the successful completion rates of all major courses in the program.

Course	2013	2014	2015	2016	2017
CAT-1003	NA	NA	100.0%	94.4%	94.4%
CAT-1043	75.0%	80.0%	87.7%	60.0%	80.8%
CAT-1053	91.7%	91.7%	100.0%	100.0%	90.0%
CAT-1113	NA	NA	NA	NA	100.0%
CAT-1214	60.8%	76.5%	80.3%	65.8%	67.9%
CAT-1223	73.7%	66.7%	72.2%	NA	NA
CAT-1233	100.0%	100.0%	83.3%	NA	NA
CAT-1253	79.2%	89.3%	100.0%	93.3%	85.7%
CAT-1313	82.4%	75.0%	65.0%	83.3%	100.0%
CAT-1323	88.9%	100.0%	80.0%	NA	100.0%
CAT-1413	100.0%	100.0%	100.0%	100.0%	NA
CAT-1513	80.0%	84.4%	89.7%	86.1%	NA
CAT-2023	100.0%	100.0%	100.0%	NA	83.3%
CAT-2113	72.7%	100.0%	71.4%	100.0%	NA
CAT-2123	NA	NA	NA	NA	100.0%
CAT-2143	100.0%	88.9%	94.1%	NA	NA
CAT-2163	85.7%	46.2%	100.0%	60.0%	77.8%
CAT-2223	88.2%	100.0%	100.0%	NA	NA
CAT-2313	100.0%	100.0%	66.7%	100.0%	NA
CAT-2533	75.7%	78.4%	90.0%	NA	NA
CAT-2543	84.1%	88.6%	92.3%	82.9%	58.3%
CAT-2633	92.9%	57.1%	88.9%	NA	NA
CAT-2703	100.0%	100.0%	100.0%	100.0%	100.0%
CAT-2733	63.2%	80.0%	78.9%	NA	NA
CAT-2924	90.0%	72.2%	50.0%	73.3%	83.3%

b. Report the successful completion rates of all general education courses in the program.

Course	2013	2014	2015	2016	2017
CS-1103	62.8%	66.70%	67.4%	69.3%	67.6%

c. Describe program student success initiatives.

In 2016, faculty modified the Computer-Aided Technology option to include a course in 3D fabrication. Two dedicated areas, TechLab1 and TechLab2, have been set up for fabrication. These two rooms have 350 square feet. Over the past five years, faculty have been able to purchase equipment with Carl Perkins funding. This equipment includes 3D printers, a desktop CNC machine, and a laser cutter. Without the luxury of having a machine shop, this is the next best solution. Students receive hands-on experience designing and manufacturing products using the Tech Labs. In addition to the dedicated 3D fabrication course, students are able to use the equipment in other courses.

As funds are available, tutors are available in the Student Computer Center. Faculty identify qualified students in the program and recommend them to the Student Computer Center supervisor. Prospective employers, such as the Oklahoma Department of Transportation, will come to campus and talk with students about employment, successful interview skills, and preparing for interviews.

Students are encouraged to attend the local Solidworks User Group, where they can network with other Solidworks users and industry partners.

Faculty have taught STEM classes during summer Cyber Camps. These camps include K-12 students.

- d. Describe results from success initiatives and future plans to increase student success based on success initiative results.

By using the Tech Labs, students are able to connect the dots from design to production. They get excited when they are able to manufacture their designs. It is not just a cool 3D model on the computer; it is an actual working product.

In 2016 and 2017, six students were hired by ODOT, with starting salary between \$32,000 and \$38,000.

Future plans include integrating fabrication more into other courses and continue using tutors when faculty are not available.

5. 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:

<u>1000 Level Courses – Number of courses taught</u>				
FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
55	50	46	22	15
<u>1000 Level Courses – Average class size</u>				
FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
7.6	7.3	9.5	9.3	10.4
<u>2000 Level Courses – Number of courses taught</u>				
FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
33	30	31	14	11
<u>2000 Level Courses – Average class size</u>				
FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
6.0	5.7	6.3	5.4	4.4

- b. Student credit hours by level generated in all major courses that make up the degree program for five (5) years.

FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
2,158	1,854	2,224	1,218	765

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

Technology use in the classroom continues to expand to meet the needs of our students. 190 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 \$1.55 Million. A faculty committee submitted a proposal for a classroom design that supports flexibility in classroom functionality including thin clients, a smaller folding presentation station, and moveable furniture. This committee's proposal was adopted and supported by the Academic Affairs' Deans and President's Cabinet. Through a multi-department effort a total of \$400,000 were spent to redesign 8 classrooms to support active learning and cooperative learning formats of instruction as well as a more traditional lecture style.

Faculty members are continuing to utilize student response software, interactive whiteboards and projectors, tablets, and network computing devices in classrooms. OCCC continues to support the utilization of technology in the classroom so faculty can continue to engage students. 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 144 full-time faculty as well as the 428 adjunct faculty members. They support them through organized workshops, online training modules, and individual faculty consultations conducted via phone, email, or in person. The consultations focus on instructional strategies, course design/redesign, assessment construction, selection and use of instructional technology, and aspects of using the College's LMS.

- 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		
Computer Science	AS, AAS, C	3
General Education Courses Hours Generated		
Computer Science	AS, AAS, C	2,895

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

Full-Time Faculty

John Helton – Professor of Computer-Aided Technology

Adjunct Faculty

Cossey, Christopher

Fagin, Todd

Gregory, Douglas

Schroyer, Matthew

Segraves, Jimmy
Sengvilay, Phonvilay

COMPUTER AIDED TECHNOLOGY AAS, C FTE: 1.3	CAT-2023	3
	CAT-2123	3
	CAT-2163	3
	CAT-2543	3
	CAT-2703	3
	CAT-2924	24

- f. If available, information about employment or advanced studies of graduates of the program over the past five (5) years.

Employers of OCCC's CAT Program graduates include: Oklahoma Department of Transportation, Federal Aviation Administration, Cox Communication, Eastern Tribal Schools, AT&T, Tinker Air Force Base, Department of Defense, Silver Star Construction, TME, Inc., W&W Steel, City of Oklahoma City, City of Edmond, OESCO Inc., Midwest Hose, Maxcess International, Hobby Lobby, Sonic, Devinci Cast Stone, Climate Craft, 4Corners Homes, Benham Group, and others.

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

The CAT program is an AAS and certificate program, but program faculty will be looking at direct transfer opportunities for students with technology centers so that there can be more connections with students and transferring.

6. Duplication and Demand

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

The Computer-Aided Technology program changed from five options to three options. The Unmanned Vehicle System option was added in 2016 in anticipation of the rule changed by the FAA and drone pilots.

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

Since the last program review, faculty have been contacted 80 times by employers looking to hire students. These job opportunities are mentioned to students in class, posted on the bulletin board in the student computer center, and emailed to current and former students using the CAT listserv. Currently, 150 people subscribe to the listserv.

In the past two years, six students were hired by ODOT, earning between \$32,000 and \$38,000. Several students were hired before they completed the program. They are in the process of completing their studies to graduate in May 2018.

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

The faculty and staff have been asked numerous times by the Professional Development Institute to teach professional training courses to business and to serve as content expert evaluators at local colleges and technology centers.

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

The faculty, staff, students, and alumni have contributed to the cultural life and wellbeing of the community in several different ways.

- Volunteered at the Oklahoma Regional Food Bank, Feed the Children, Food and Shelter for Friends.
- Faculty and staff have given presentations at various schools on career days.
- Faculty have donated time and services to non-profit organizations.
- Faculty and students have served as judges for Skills USA Contest for local high schools and technology centers.
- The graduate survey indicated that 28% of graduates have volunteered in the community.

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

CAT 1214 - Computer-Aided Design has been offered online since spring 2013. The GIS courses, CAT 1313, CAT 1323, and CAT 2313 are offered as hybrid classes. These classes are half online and half in the classroom.

7. 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.

The CAT department shares its classrooms with the Computer Science department, Digital Media department, and Professional Development Institute and will soon be sharing it with the Business department. In addition, classrooms are available to other areas on campus by request. The Autodesk software is free to education. A site license is currently being used by the Computer-Aided Technology department, Digital Media department, and Engineering.

There are 45 seats of the SolidWorks software with installed network licenses that allow use in the classroom, Student Computer Center and the Engineering Lab.

Equipment purchased by the department is used by other departments, such as Computer Science, Digital Media Department, and Engineering.

All of the instructors use Moodle to complement their classes, which in turn reduces the number of printed documents needed for the classes.

Because the program requires high-end computers, they tend to cost more than the average computer on campus. Computers are replaced approximately every three to five years. However, they are reallocated

to other classes with the division and the college. They are used well beyond their life cycle in the program. Many of these computers are used at least six years on campus.

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 and staff have shown a consistent dedication to maintaining the excellence of the program and success of the students. They stay current in their area of expertise and are willing to learn new material and software for the success of the program and students.

Equipment: The hardware and software are current and similar to what is used in business and industry. This ensures the students will be up to date when they graduate and enter the workforce.

Resources: The Student Computer Center, Tech Lab1, and Tech Lab 2 are conveniently located on the third floor of the OCCC Library along with the faculty offices. These resources and the staff allow students the opportunity to continue the learning process outside of the classroom. Excellent lab tutors have been hired to increase student success.

Scheduling: Flexible scheduling of courses.

Recognition: The program is well known for producing high-quality graduates.

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

- Decline in student enrollment
- Lack of exposure and promotion of the program. The CAT program is not included in STEM advertisement or promotional material.
- The Unmanned Vehicle System program has not taken off because of air flight restrictions indoors and outdoors.

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

Decline in student enrollment

- Improve recruitment efforts by working with Recruitment and Admissions.
- Increase social media presences by working with Public Relations.
- Work with the Professional Development Institute to develop articulation agreements so students attending professional development courses can receive college credit.
- When the time comes, develop a matrix of direct transfer courses from technology centers.

Lack of exposure and promotion of the program. The CAT program is not included in STEM advertisement or promotional material.

- Work with Engineering and other programs on campus to promote STEM education.
- Increase involvement in summer STEM related camps.

The Unmanned Vehicle System program has not taken off because of air flight restrictions indoors and outdoors.

- With the help of Joe Hartpence (PDI Adjunct), there is now limited airspace authorization on the main campus.
- Work with Dean Claybon to promote the UVS/UAS program.
- Hold workshops or information sessions on campus to promote drone usage and their benefits.

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

The Computer-Aided Technology program at OCCC has provided the state with qualified technicians in CAD and GIS. The employment opportunities for OCCC's graduates continue to grow. Companies are seeking qualified employees with college degrees.

To meet the needs of business and industry, it is important to increase the awareness of the program and career opportunities. To increase the awareness, there are some recommendations:

- Promote the program on television, radio, and on the college's main Facebook page.
- Design new brochures to promote the program at careers fairs.
- Show off the program through public events like an open house and "Lunch/Learn" sessions.
- Set up internships with local companies.
- Pursue 2+2 transfer programs.
- Work with the STEM coordinator to promote programs in local schools.
- Develop PLAs so individuals taking courses at PDI can also be awarded college credit.

APPENDIX

Program Curriculum:

Program Requirements:

Minimum Required Hours: 60

Major Courses		
Prefix & Number	Course Title	Credit Hours
CAT 1043	Engineering Principles (CAD)	3
CAT 1053	Manufacturing Materials and Processes (CAD)	3
CAT 1113	Unmanned Vehicle Systems (UVS)	3
CAT 1123	UVS Operations (UVS)	3
CAT 1133	Airspace and Regulations (UVS)	3
CAT 1214	Computer Aided Design (CAD)(GIS)(UVS)	4
CAT 1253	CAD 3D Parametric Modeling (CAD)	3
CAT 1313	Introduction to Geographic Information System (GIS) (UVS)	3
CAT 1323	Introduction to Spatial Technology (GIS)(UVS)	3
CAT 2023	Design Mechanics (CAD)(GIS)(UVS)	3
CAT 2123	Digital Fabrication (CAD)(UVS)	3
CAT 2163	CAD Automation (CAD)	3
CAT 2313	Introduction to Spatial Analysis (GIS)	3
CAT 2540	Applications in CAD (CAD)	3
CAT 2703	Practicum (CAD)	3
CAT 2924	Design Project (CAD)	4
CS 1103	Introduction to Computers and Applications (CAD) (GIS) (UVS)	3
CS 1143	Beginning Programming (GIS) (UVS)	3
CS 1333	Database Management Applications (GIS)	3

General Education Courses		
Prefix & Number	Course Title	Credit Hours
	OSRHE Approved Gen Ed Communications or English Course (CAD)(GIS)(UVS)	3
ENGL 1113	English Composition I (CAD)(GIS)(UVS)	3
GEOG 2603	World Regional Geography (GIS)	3
HIST 1483	U.S. History to 1877 or	
HIST 1493	U.S. History 1877 to Present (CAD)(GIS)(UVS)	3
MATH 1513	College Algebra for Business, Life Sciences and Social Sciences (CAD)(GIS)(UVS)	3
PHYS 1114	College Physics I (CAD)	4
POLSC 1113	American Federal Government(CAD)(GIS)(UVS)	3

Support Courses		
Prefix & Number	Course Title	Credit Hours
MATH 1613	Trigonometry (CAD)(GIS)(UVS)	3
	Faculty Approved Electives (CAD Option)	2
	Faculty Approved Electives (UVS Option)	9
	Faculty Approved Electives (GIS Option)	12

Life Skills Courses		
Prefix & Number	Course Title	Credit Hours
SCL 1001	Success in College and Life (CAD)(GIS)(UVS)	1