

Submission date: 2/11/2020

Program/s in this review: Cisco-Certified Network Associate OEC, Computer & Networking Technology AAS, Computer Systems Technology AAS

Specialized accrediting agency (if applicable): _____

Campuses where the program is delivered: Anchorage (OEC & CNT AAS), Mat-Su (OEC & CST AAS)

Members of the program review committee:

David Morrison, Associate Professor, ANC
Harry Banks, Professor, MSC
Chris Foster, Assistant Professor, ANC

1. Centrality of Program Mission and Supporting Role (700 words or less)

Relevance

Our program provides technical skills for individuals who wish to enter or advance in the Information Technology industry.

This program helps in Shaping Alaska’s Future by contributing to Student Achievement and Attainment (theme 1); having productive Partnerships with Public Entities and Private Industries (Theme 3); and being Accountable to the People of Alaska (theme 5). It also builds skills in the Network Systems, and Information Support and Services sector of the Information Technology Career Cluster

Supporting Roles

Our program supports a Bachelors in Advanced Technology Leadership (ATL), which is the shortest route currently available to CNT students to earn a bachelors. The CNT program created CNT A390 selected topics courses that can be used for upper division credits in the BSATL and as selective credits in the AAS.

Partnerships

Our program works with two advisory boards, one made up of employers in Anchorage and one made up of Matsu employers. Key members include Mat-Su Borough, Mat-Su School District, MEA, MTA, GCI and the Anchorage Technology Forum.

Mat-Su students benefit from a strong internship program with local employers and a fall Meet-N-Greet with advisory council member businesses in preparation for spring workplace experience courses or independent projects.

Our program has an articulation agreement with the Anchorage School District for two entry level courses and with the Matsu School District for A+ and CISCO courses. The CNT program has a faculty member serving on the advisory board for two of the Anchorage school district programs: Electronics & Telecommunication and Information Tech. A faculty member has also been representing our program during student outreach events that occur at the Anchorage School District.

Our program maintains partnerships with the Cisco, Microsoft and VMware, which are all worldwide players in IT. Agreements with Microsoft and VMware provide access to key software to both the program and the students. The Cisco Networking Academy and VMware Academy provide access to curriculum for training in basic networking skills using Cisco equipment and server virtualization using VMware software.

Extramural Funding

To date the CST program has received a State DOL grant, and TVEP grants to enable the program to provide cutting edge technologies, equipment, and hands-on experience. Currently the department delivers over 470 virtual servers and personal computers to its students. If each virtual computer represented purchased hardware at only \$650 each, they represent a value of over \$300,000 provided to students. Some virtual machines provide services found in hardware costing \$2,000 to \$5,000. This program makes very effective use of grant monies it has received.

Employment Opportunities and High Demand Designation

According to the Alaska Department of Labor, the occupations that are directly related to our program include: Computer Network Architects, Computer Network Support Specialists, Computer Systems Analysts, and Information Security Analysts.

<http://live.laborstats.alaska.gov/atc/program.cfm?pg=02300251>. The CNT program is listed by the DOL as an "Alaska Performance Scholarship Eligible Training Program" which is a program offered to Alaska High School Students with grants from \$2,378 to \$4,755 per year.

The Alaska State Department of Labor in its 2014 -2024 Occupational Forecast identified a total of 122 projected job Openings for Network and Computer Systems Administrator (SOC 15-1142 between 2014 and 2024. When Related jobs such as Computer Network Support Specialists, Computer User Support Specialists are included, a total of 373 job openings are projected; with a total of 2498 openings for the whole DOL category of Computer and Mathematical jobs. The Alaska DOL projects Computer and Mathematical Occupations in the top 5 Wages by Category list. (Alaska 2015) Cited in the October 2016 "Alaska Economic Trends".

In the October 2016 "Alaska Economic Trends" Computer User Support Specialists were listed in "Alaska Top Jobs" list with 186 projected openings. The category is identified as "growth low, openings high."

In the Alaska IT & Telecommunications Workforce Summary, put out by UA Statewide and UAA Offices of Workforce Programs on September 27, 2018, two of the top occupations are Computer User Support Specialists and Network & Computer Systems Administrators. Both occupations our program prepares students for. Between these two occupations there is a gap of 169 hires between the number of vacancies that needed to be filled and the number of UAA graduates that were available to fill those vacancies.

2. Program Demand (including service to other programs), Efficiency, and Productivity (7 year trend; 1400 words or less)

Enrollment Trends

Enrollment in the program appears to have cycled through a high and is now going into a low. We do not know the reasons why it went up or why it is going down now, other than the downturn in the Alaska economy. The demand in computing programs is rarely steady and tends to go through periods of time with significant expansions and contractions. These cycles are driven by student interest, perceived potential to enter a high-paying profession, and the current hiring patterns of employers. We have identified our primary market as people who have been out of high school for at least a few years and have either decided to change careers or have decided they should start a career and are interested in IT, but have no experience in IT.

When enrollment was at its height, CNT introduced a barrier in the form of a department hold on our most difficult entry level course requiring students test proficient in reading. This was to limit entrance to those most likely to be successful since we could not accommodate all students, and there were not enough students to justify additional sections. That barrier was removed as enrollment dropped. CST (Mat-Su) had a computer competency test that had to be passed or the student had to pass CIS A105 to enter the program. That barrier was removed in the CST program. No other barriers exist. There are no admission requirements, and we do not require any of the general education courses to be completed before taking any major requirements.

The average credits attempted for the associates is 9.6, and the Years per Degree averages 4.7. This confirms that we have a good mix a of part time and full-time students. Most of our courses are taught in the evening to allow for students that work part or full time during the day, which is most of our students.

Awards Trends

We graduate an average of 27 students each year. This is about a twenty two percent completion ratio when comparing with the numbers of students that enroll each year. This is slightly higher than either the UAA rate or the Community and Technical College rate for associate degrees, which are about 19%.

To reduce credit hours as a barrier to graduation, we have attacked this on two fronts. The first was to lower the total credits required progressively lower. As part of combining our two degrees we are lowering the credits to 60. Secondly, we have worked to find more ways to count course work done previously at other schools or in other programs in lieu if some of our required course work.

Our students average 79 credits per degree, taking 4.7 years per degree. Again, this verifies that for most of our students, they do not start with our degree, but usually end up in our program once they have spent some time gaining life experience and have a better idea of what they want to do.

The CCNA OEC awards has dropped to an average of 1 to 2 a year since the Occupational Endorsement used to be free and now students are charged. Since the OEC course are contained within the associate degree, students going for the associates would earn the OEC on the way to the associates. Now only those seeking just the CCNA OEC tend to sign up for the OEC program.

Out of the 190 AAS graduates 5.8% were Magna Cum Laude, and 15.3% Cum Laude, a notable achievement considering the challenging technical nature of the degree.

Course Pass Rates

Course pass rates are consistent and steady in the low- to high-eightieth percentile. Our instructors put a lot of effort into helping students to succeed and we hold an open lab on Saturdays to help students that need additional support/lab time.

Productivity

Since our total SCH is much higher than the CNT enrollment numbers would indicate during many years, it is likely due to students that are late to either declare us as their major, or to do a change of major. The ratio of SCH per FTE faculty has not dropped as much as might be expected, due to a reduction of FTE faculty. Halfway through AY16 a faculty member died unexpectedly, and since then another faculty member has retired, while only one position was replaced. It is expected that the faculty line will be restored when enrollment/SCH in the program returns to sufficient levels.

Our class sizes and class capacity utilization are on a downward trend and we have taken steps to fix these issues by reducing the number of courses we offer to raise our class sizes and bring class capacity utilization to sustainable levels.

Internal Demand

Sixty three percent of students taking CNT courses are majors in our program. About thirty seven percent are made up of students from other programs. Anecdotal data suggests that most of the students who are not majors in our program are considering a change in major but have not done so yet. There are some that are pursuing our courses as a side interest that they can use to fulfill general 100-level requirements in their chosen major. We do have a small synergy with the Applied Technology Leadership Bachelor, where students that continue to that degree from our associates can take some 300-level CNT courses to further their technical knowledge.

3. Program Quality, Improvement and Student Success (1500 words or less)

Currency of Curriculum

Our program was last updated in the spring of 2016 and is currently being updated again. The course content for most of the courses are driven by the current curriculum revisions coming from CompTIA and Cisco. The main job of the faculty is to maintain currency with the industry's current best practice and to ensure that that the student learning outcomes line up with the degree outcomes. Some courses need updating to reflect current technologies or at least to remove obsolete ones and that process is underway. There are special topic courses to allow for emerging topics to be included in the curriculum.

Distance

Much of our program requires in-person hands-on due to most of our students having no IT experience. Where possible we have incorporated distance courses, such as Customer Service, Introduction to Information Security, and a special topics course in PowerShell. From time to time students will take advantage distance-delivered CISCO courses originating from Fairbanks. Mat-Su hosts a remote access Windows Server Active Directory environment in which students can collaborate and build project solutions. Additionally, Mat-Su has also invested in an NDG Netlab+ which can provision 24/7 remote lab experiences for CISCO, VMware, EMC Storage, Linux, CISCO Security, and 10 or more additional instructional content areas. While most of the program delivery has been face to face, we are looking for opportunities to use tools such as the Netlab as a distance instruction alternative.

Program Assessment

The most significant change was removing the need to complete CIS 105, or equivalent, prior to entry into the program. The first year the change was published there was an immediate improvement in CST major declarations. CNT removed a WRTG A111 placement requirement for entry into the CISCO courses. This barrier was introduced when enrollment was higher than we could handle and was removed as enrollment dropped.

CST has employed community project managers to evaluate student projects and has seen an improvement in project quality.

Our program would like to find a way to fund CISCO Certification tests for all CCNA3 students on a consistent basis without raising student fees. The goal would be to develop an Academy which could approach the 80% Certification pass rate found in the best CISCO Academies in North America.

The CNT assessment process is most helpful for our program because we have valid data and are able to act on the data part way through the school year if needed.

The biggest improvement the CNT program needs to make concerning assessment is for program faculty to gain a greater understanding of how to best assess a program.

We are in the process of merging assessment along with merging the two programs.

Student Success

Student engagement is maintained in the program by requiring students to take a common progression of courses that focuses on building a foundation of computing skills and moves into networking and server system administration skills. These courses require students to not only complete tasks individually, but they are also required to participate in collaborative assignments and projects. The program also incorporates capstone projects in many of their courses that integrate and apply the course content to a specific scenario.

The program includes courses which simulate IT work which is done in a team setting and require project management skills. Students are required to participate in collaborative assignments and projects. Executives from the community, with project management experience, are brought in to formally review project presentations and give feedback to students in a professional business setting. Other capstone courses involve students directly in internship or independent projects.

Students are encouraged to see how the skills they are learning in the program provide a strong base for a productive career in Information Technology and Networking. All instructors use projects, team activities, and hands on experiences at every opportunity. All the instructors in the program have extensive workplace experience and attempt to replicate the values, processes and collaboration found in a vital enterprise IT environment. Some projects the students are involved in provide solutions for various departments or community agencies in service learning engagements.

The program encourages students to look beyond the program and prepare for their first job from day one in the program. Students are encouraged to take advantage of jobs with local employers while they're in the program, and students are made aware of jobs local employers tell us about. Students are given additional credit for work experience if they take the optional industry workplace experience course.

Academic advising begins at MSC Student Services in Mat-Su, and a college level advisor in Anchorage. They provide advising for general issues such as financial aid and guidance for navigating the University academic system. When more specific technical and course knowledge is needed, such as with potential transfer courses, the student is referred to program faculty. The program enjoys a high level of collaborative process with more general advising on both campuses. Frequently a student advisor and faculty advisor will meet with a student and arrive at a best-case solution for unique advising situations.

Student Accomplishments

A team of Mat-Su students won first place in the local campus student showcase; The Mat-Su CISCO classes have competed in the USA/Canada CISOC NetRiders Competitions, placing as high as 14th out of 100+ competitors from all over North America. Anchorage students in the CISCO courses have a pass rate 30% higher than the national average. Many of the students at both campuses go on to earn the CCNA certification, which is extremely valuable in the IT industry.

An IT employee for a local Mat-Su business was in the CST program and taking the project management course. The class formed a team and started planning to model a possible upgrade to the business, a few weeks into the project the executives at the business indicated an interest in having a real proposal. The team researched three alternatives and went on site and presented the proposal to the executives. The project was adopted, and the student went on to implement the solution for the agency. A couple of years later, another CST student interned at that company under the previous student.

Another student later took over the same IT position, which served 140 employees. He took on one of his classmates as an intern and later hired him as a fulltime employee. The intern student came to the CST program through Job Corp. For his project management independent project, he wrote a proposal for VDI deployment on the Mat-Su campus for the MSC IT department. It was adopted and with some minor changes implemented.

Those two students have been running the IT department to this day. They have and gone through expansion, participating in a new building design and move, implementing and selling cloud based HIPPA compliant IT services to other similar nonprofits in the state (one is in Fairbanks). Building on the Windows Active Directory experience and experience with virtual machines they have built a full-service Active Directory domain for their agency. One of the students translates his day-to-day expertise in Windows Active Directory servers into practical hands on instruction for the Windows server classes delivered by the Mat-Su CST Program.

Another student took the CST Project Management course and subsequently began a startup company. He hired another first year CST student as an intern whose 1-year experience with the program inspired him to join the new company. They have expanded from 4 to 11 employees and added a Security Operation Center to their capabilities. They were contracted as part of the Mat-Su Borough ransomware recovery team. The intern is now their Senior Security Architect and credits his experience in the CST program with giving him a head start in his career. At present company is located in Palmer, AK but selling services throughout the western states and negotiating a contract with the Navy. The company is expecting to hire 3 additional employees in the near future and is working with the CST program to develop internships to provide a stream of candidates as their company expands. While this had not resulted in any graduation metrics, the program has contributed to a major new presence in the IT community in the state of Alaska and beyond. This new company is on the CST advisory council and keeps the program relevant to the emerging trends

4. Program Duplication / Distinctiveness (300 words or less)

CNT (UAA) and CST (Mat-Su) are merging into one degree to address duplication between our programs and that is why we were directed to submit this combined review. There is a similar program offered in Fairbanks, Information Technology Specialist AAS. Our program currently makes use of the CCNA courses that they offer distance when appropriate for students that already have IT experience. I believe regional differences in specific technical skills desired warrant the programs remaining separate. There may be some course sharing possibilities, but this is limited by the requirement of hands on training to effectively teach most needed skills.

5. Summary Analysis (500 words or less)

Strengths

- Program trains students for a high demand vocation that pays well

- Program offers hands on experience with equipment that is critical to students beginning or transitioning to an IT career.
- Partnerships with industry leaders such as Cisco, Microsoft, and VMware.
- Diverse and strong advisory council in Mat-Su

Areas of Concern

- Advisory council in Anchorage not diverse enough
- Declining enrollment
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Opportunities

- Opportunity for stronger and more diverse local industry involvement through the Anchorage Technology Forum
- Some local employers have reached out looking for more of our students due to being impressed with recent hires of previous or current students.
- Changing state revenues has created hiring freezes in some agencies, this has created opportunities for the program to expand the number of collaborating agencies in the workplace experience and internship arena.

Challenges

- Finding and training qualified and willing adjunct instructors
- Reaching our primary demographic of potential students. These are candidates who have been in the work force for a while and have now decided that they wish to change into a career in IT.
- Staying current on hardware and software that is rapidly changing. No funding for attending important trade and industry conferences create a serious liability for our program
- First year students that are unprepared for the rigorous expectation of college courses