DALTON STATE

COMPREHENSIVE ACADEMIC PROGRAM REVIEW

Note: Enter "NA" wherever data are not applicable or not available for the program under review.

Program Characteristics
Academic Program Name: **Computer Networking and Service Technology**
Degree: **Associate of Applied Science (A.A.S.)**
Program CIP Code: **11.0901**
School and Department: **School of Science, Technology, and Mathematics – Department of Tech and Math**
Time frame for this review: **2013-2017**
Date of last internal review: **2015**
Current date program reviewed for this report: **April 2019**

Program Goal Statement and Student Learning Outcomes
Program goal statement: This program will provide students with knowledge and skills in Computer Networking and Service. It is designed to successfully prepare students for a career in Computer Networking and Service.
Program outcomes: 1. Knowledge of relevant information technology. Graduates of the A.A.S. in Computer Networking and Service Technology program will have relevant knowledge in several areas of technological study, including computer networking, hardware maintenance and repair, computer programming, Linux operating systems, and network security. 2. Graduate satisfaction with the program. Candidates for graduation in the A.A.S. in Computer Networking and Service Technology program will report a high level of satisfaction with the program. 3. Graduates will be successful. Graduates of the A.A.S. in Computer Networking and Service Technology graduates will find employment related to their degree or gain acceptance into bachelor's degree programs.
Student learning outcomes 1. Students will demonstrate the skills and knowledge that emphasize current computer networks, systems management, and internet technologies. 2. Students will demonstrate the ability to maintain and repair a PC's hardware and peripherals. 3. Students will demonstrate knowledge of basic security fundamentals.

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Brief Assessment of Previous Program Review

Outcome of previous program review (brief narrative statement).

The A.A.S. in Computer Networking and Service Technology program is a viable program in the School of Science, Technology, and Mathematics. The program produces graduates who are well prepared for employment in the high demand information technology field. The continuing job outlook for graduates of the program is very good with graduates being extremely employable at the associate's degree level.

What improvements have occurred since the last program review or assessment?

- All technology classes have received upgrades in both equipment and curriculum to stay current with emerging technologies.
- This degree can be used to seamlessly integrate into the new B.A.S. in Technology Management which was transferred to the School of Science, Technology, and Mathematics from the Wright School of Business.
- A STEM Advisory Council has been established which is comprised of faculty members from the School of Science, Technology and Mathematics, the Wright School of Business and several local industry leaders. This council provides an avenue for open lines of communication between Dalton State and local industry providing opportunities for us to better understand and meet industry needs.

What changes or revisions have been made to the program, its curriculum, or its program/student learning outcomes since the last program review? Please include a follow-up discussion of the previous review's action plan?

The B.A.S. in Technology Management was transferred to the School of Science, Technology, and Mathematics from the Wright School of Business.

Several courses underwent changes in name, prerequisites, descriptions, and credit hours due to CISCO academy changes in the curriculum for the courses and the addition of online technology used in the delivery of the curriculum. The affected courses were CAPS 1145, CAPS 1152, CAPS 1240, CAPS 1270, CAPS 1276, CAPS 1277, CAPS 1285, CAPS 1286, CAPS 1287, CAPS 2278.

CAPS 1101, CAPS 1120, CAPS 1255, CAPS 1265 were removed from the program. CAPS 1240 Advanced Topics in CAPS, CAPS 2278 CCNA Security, ELCT A+ Certification Review, and MGIS 2201 were added as required courses in the program. These changes allowed students completing the A.A.S. degree to move on to the B.A.S. degree without repeating a course covering the same or very similar topics.

Prerequisites were removed from CAPS 1145 Introduction to Networks because the required skills a student would need to complete the course became an included part of CISCO's training modules.

Student Demographics

Enrollment	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	% Change
Headcount	44	51	58	54	48	9.1
FTE	34.0	37.3	45.7	45.2	38.1	12.1
Enrolled Full-time	17	20	26	31	25	47.1
Enrolled Part-time	27	31	32	23	23	-14.8
Female	6	3	9	8	6	0
Male	38	48	49	46	42	10.5
Alaskan Native/Native American/American Indian	0	0	0	0	0	[1]DNE
Asian, Hawaiian, Other Pacific Islander	0	0	2	4	4	DNE
Black/African-American	3	3	4	7	2	-33.3
Hispanic	0	0	0	0	0	DNE
Multi-racial	0	0	0	0	0	DNE
Undeclared	3	8	10	6	2	-33.3
White	38	40	42	37	40	5.3

Analysis and comments on student demographics.

The headcount in the program has increased 9.1% with the increase coming from the full-time enrollment which increased 47.1%. In terms of ethnicity, enrollment of white students remained steady, but enrollment of students of other ethnic and racial groups decreased. The ratio of male to female remained virtually unchanged over the review period going from 38/6 to 42/6.

[1]DNE is a mathematical abbreviation for "Does Not Exist" often used for undefined expressions or when a proper solution does not exist.

Faculty Indicators of Program Quality	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	% Change
Department faculty teaching Major Field Courses in program (excluding Areas A through E)	5	5	4	4	5	0
Full-time faculty teaching Major Field Courses	5	4	4	4	4	-20
Part-time faculty teaching Major Field Courses	0	1	0	0	1	DNE
Total faculty teaching Major Field Courses	5	5	4	4	5	0
Percent of Major Field Courses taught by full-time faculty	100	92.6	100	100	95.8	-4.2
Gender (full-time and part-time faculty)	**Fall 2013**	**Fall 2014**	**Fall 2015**	**Fall 2016**	**Fall 2017**	**% Change**
Male	4	5	4	4	4	0
Female	1	0	0	0	1	0
Race/Ethnicity (full-time and part-time faculty)	**Fall 2013**	**Fall 2014**	**Fall 2015**	**Fall 2016**	**Fall 2017**	**% Change**
Alaskan Native/Native American/American Indian	0	0	0	0	0	DNE
Asian, Hawaiian, Other Pacific Islander	0	0	0	0	0	DNE
Black/African-American	0	0	0	0	0	DNE
Hispanic	0	0	0	0	0	DNE
Multi-racial	0	0	0	0	0	DNE
Undeclared	0	0	0	0	0	DNE
White	5	5	4	4	5	0
Tenure Status (full-time faculty)	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	% Change
Tenured	4	3	3	3	3	-25
On-tenure track	0	0	0	0	0	DNE
Non-tenure track	1	1	1	1	1	0
Rank (full-time faculty)	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	% Change
Professor	1	1	1	1	1	0
Associate Professor	2	2	2	2	2	0
Assistant Professor	1	0	0	0	0	-100
Instructor/Senior Lecturer/Lecturer	1	1	1	1	1	0

Faculty Indicators of Program Quality

Highest degree (full-time faculty)	2013-14	2014-15	2015-16	2016-17	2017-18	% Change
Doctorate	1	1	1	1	1	0
Specialist	0	0	0	0	0	DNE
Master's	3	2	2	2	2	-33.3
Bachelor's	1	1	1	1	1	0
Associate's/Other	0	0	0	0	0	DNE

Provide additional details, analysis, and comments regarding faculty indicators of program quality.

The number of faculty teaching in the program has remained basically constant during the current review period with almost all major field courses being taught by full-time faculty. A strength of the program is the faculty teaching in the program. The majority (75%) of faculty teaching the program are tenured and hold at least a master's degree. All have years of experience in both teaching and using the technology, and the stability and quality of the faculty are strengths of the program.

Indicators of Measures of Quality

Student Input	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	% Change
Mean ACT score	19.5	19.8	19.6	19.2	18.9	-3.1
Mean SAT score	460	450	426	425	467	1.5

If applicable to your degree program, provide any additional external quality assurance data/information or results (e.g., professional accreditation results, National Survey of Student Engagement [NSSE], market rankings, etc.).

Neither external accrediting bodies nor market rankings are used or tracked for the program. During the review period, the mean ACT score decreased slightly while the mean SAT score had a slight increase. Students accepted into Dalton State can self-select into the computer networking program as there are no incoming qualification criteria for the program. Internally, both professional and faculty advisors monitor student progress through the program.

Indicators of Measures of Quality

Student Output	2013-14	2014-15	2015-16	2016-17	2017-18	% Change
Exit scores on national/state licensure (If applicable)	NA	NA	NA	NA	NA	NA
Graduating majors' mean GPA	3.29	3.28	3.18	3.22	3.35	1.8
Employment rate of graduates (if available)	NA	NA	NA	NA	NA	NA
Number of students entering graduate/professional programs	NA	NA	NA	NA	NA	NA

Describe the extent to which students have achieved current program outcomes during this program review cycle (most recent year).

Program outcomes:

1. Knowledge of relevant information technology

Courses in the computer networking program are regularly assessed by the program faculty using WEAVE as the assessment instrument. Each year several courses in the program are assessed, and assessment results from these courses during the review period demonstrated that students had knowledge of the relevant information technology. See the assessment of student learning outcomes below for specific courses.

2. Graduate satisfaction with the program
3. Graduates will be successful

Data regarding these two program outcomes has not been regularly collected. When collected, relatively small numbers of graduates per year coupled with low response rates make it impossible to draw any sound conclusions on these outcomes. A new assessment plan will be put in place to aid in regularly collecting this data.

Describe the extent to which students have achieved current student learning outcomes during this program review cycle (most recent year).

Assessment of the student learning outcomes during this review period has been a bit inconsistent. Although much data is available, accurate data to assess these outcomes for the most recent year 2017-18 is incomplete. The available data is given here.

Student learning outcomes:

1. Students will demonstrate the skills and knowledge that emphasize current computer networks, systems management, and internet technologies.

CAPS 1152 Linux

Target - Students are to keep a notebook with written Linux commands and earn at least a 90% score.

Findings - Students are required to understand some of the basic knowledge of working with a Linux operating system and learn basic command line skills. Students who completed the assignment had an average score of 94% on the Command Journal assignment.

CAPS 1240 Advanced Topics in CAPS

Target - On a post-test, students will describe the Internet and its evolution to the Internet of Everything and explain the interconnection of people, processes, data, and the four pillars that form the Internet of Everything. Students will earn at least an 80% score on the post-test.

Findings - Students achieved an average of 82% on the post-test.

Target – On a prototyping project, students will explain the concept of prototyping and why this is critical in the IoE market. Students will earn at least an 80% score on the prototyping project.

Findings - Students scored an average of 91% on the prototyping project.

Target – Students will build and troubleshoot a simulated computer network. Students will earn at least an 80% score on the project.

Findings - Students scored an average of 85% on the project.

CAPS 1270 Routing & Switching Essentials

Target – On a post-test, students will describe networking technologies including VLANs, inter-VLAN routing, Routing Information Protocol, access control lists, Dynamic Host Configuration Protocol and Network Address Translation. Students will earn at least an 80% score on the post-test.

Findings - Students achieved an average of 74% on the post-test.

Target – In a lab assignment, students will use communication skills and teamwork to configure networking operations of routers and switches. Students will earn at least an 80% score on the lab assignment.

Findings - Students achieved an average lab score of 91%.

Target – Students will earn at least an 80% score on a comprehensive skills exam to configure and troubleshoot the operations in a local area network.

Findings - Students achieved an average of 82% on the skills exam.

CAPS 1276 Scaling Networks

Target - Describe networking technologies including Spanning-Tree Protocol, VLAN Trunking Protocol, Etherchanel, first hop redundancy protocols, Enhanced Interior Gateway Routing Protocol, and single-area/multi-area Open Shortest Path First protocol. Students will earn at least an 80% score on the post-test.

Findings - 92% of students passed the post-test with a score of 80% or better.

Target - Configure and troubleshoot the operations in a local area network. Students will earn at least an 80% score on a hands-on skills exam.

Findings - 92% of students passed the hands-on skills exam with a score of 80% or better.

CAPS 1277 Connecting Networks

Target - 80% of all students will pass the post-test with a score of 80% or better. The post-test will have students describe networking technologies including Point-to-Point Protocol, Generic Routing Encapsulation, Border Gateway Protocol, Simple Network Management Protocol, syslog, and Netflow.

Findings - 100% of students passed the post-test with a score of 80% or better.

Target - 80% of all students will pass a networking project with a score of 80% or better. The project requires students to configure and troubleshoot a large network simulation.

Findings - 83% of students passed the networking project with a score of 80% or better.

2. Students will demonstrate the ability to maintain and repair a PC's hardware and peripherals.

ELCT 1100 PC Maintenance & Troubleshooting

Data from this course for the most current year is not available.

3. Students will demonstrate knowledge of basic security fundamentals.

CAPS 1152 Linux

Target - Students take a chapter exam with questions about permissions that are given to files and directories owned by users and groups. Students will have to recognize how different permission types are applied to directories and the files that are contained within. Students will score at least 80%.

Findings - Create users and groups and set file permissions and ownership to protect them. A chapter exam with questions concerning created users and groups and applying permissions to their directories and files. Students who took the exam scored an average of 93%.

CAPS 2278 CCNA Security

Target - 80% or higher student average on the post-test testing student knowledge of basic network security fundamentals. Describe security threats facing modern network infrastructures and the techniques used to mitigate them.
Findings - Students achieved an average of 97% on the post-test.

Target - Students achieve an average skills exam score of 80% or higher on a comprehensive skills exam consisting of physical networking equipment. Students must use their technical knowledge and skills learned throughout the course in order to secure a local area network and troubleshoot any issues that might arise during the security configuration. Secure Cisco routers and switches by implementing various technologies including authentication, authorization, accounting, access control lists, intrusion prevention systems, virtual private networks, and firewalls.
Findings - Students achieved an average skills exam score of 84%.

The findings in this section describe the extent to which the student learning outcome targets were achieved during the most recent year (2017-18) of the review period. When a target is not met, an Action Plan for Improvement is put in place by the instructor at the course level. These plans for improvement can be found in each course assessment in WEAVE.

Indicators of Measures of Quality

If available, provide additional information and/or results of other indicators of quality related to student output such as completer satisfaction surveys, employer satisfaction surveys, stakeholder satisfaction surveys, completion and continuation rates, attrition rates, starting salaries of graduates, etc.

As noted earlier, obtaining employment placement and satisfaction rates has been problematic. Data regarding these measures has not been regularly collected. When collected, relatively small numbers of graduates per year coupled with low response rates make it impossible to draw any sound conclusions. We do know that graduates we are in contact with have found professional employment opportunities upon graduation, but a new assessment plan will be put in place to aid in regularly collecting this data.

Describe efforts undertaken to achieve and maintain curricular alignment within the program and currency to the discipline.

The School of Science, Technology, and Mathematics has a standing curriculum committee. At least one faculty member from the Department of Technology and Mathematics serves on the committee along with other faculty members from the school. Faculty members and advisors can make proposals to the curriculum committee regarding changes to the program curriculum. These proposals are reviewed and discussed based on their accompanying rationale. Rationales for curricula changes often reference comparisons to other institutions in the USG so as to ensure that our curriculum remains relevant and consistent with that of other comparable schools.

A STEM Advisory Council has been established which is comprised of faculty members from the School of Science, Technology and Mathematics, the Wright School of Business and several local industry leaders. This council provides an avenue for open lines of communication between Dalton State and local industry providing opportunities for us to better understand and meet industry needs and keep the program current.

Indicators of Measures of Viability

Internal Demand for the Program	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	% Change
Number of students enrolled in the degree program	44	51	58	54	48	9.1
Number of students who applied to the program (if applicable)	NA	NA	NA	NA	NA	NA
Number of students admitted to the program (if applicable)	NA	NA	NA	NA	NA	NA
Percent of Major Field Courses taught by full-time faculty	100	92.6	100	100	95.8	-4.2

Describe additional details as deemed appropriate.

Enrollment during the current review period is up 9.1% (12.1% for FTE). Student demographics on page 3 attribute this increase to a rise in full-time enrollment. As indicated in the faculty demographics on pages 4 and 5, the number of faculty teaching in the program has remained basically constant during the current review period with almost all major field courses being taught by full-time faculty.

Indicators of Measures of Productivity

Graduation	2013-14	2014-15	2015-16	2016-17	2017-18	% Change
Number of degrees conferred	19	18	8	15	6	-68.4
Total student credit hours earned	80	78	93	87	102	27.5

Describe any institutional-specific factors impacting time to degree.

In order to make the most efficient and effective use of faculty resources, required courses are offered so that students can progress through the program and graduate on time. However, course density is an important factor in determining the number of sections of a course offered each semester. The enrollment in the program is not high enough to offer more than one section of some courses. Due to the required sequence of courses, required courses may only be offered once per semester or even once per year. Since this could potentially negatively impact time to degree, scheduling of courses is given careful attention and the faculty advisors and professional advisors work closely with students on progressing them through the program in a timely manner. Also, several courses in the program are offered online to aid students in scheduling their required courses. The decline in the number of degrees conferred may be a direct result of students opting to continue to the B.A.S. in Technology Management.

Evidence of Program Viability

Based on evidence from **ALL** of the above information, data, and analysis, discuss whether continued resources should be devoted to this program. This discussion must be evidence-based. Your comments should consider external factors and address questions such as the following: Are your students getting jobs? What is the job outlook for graduates? Are students prepared for the jobs they get? How is the field changing? Are program faculty members in contact with employers and getting back feedback on graduates' job performance? Do employers state or suggest a need for changes in the program?

There was a decline in the number of degrees conferred which may be a direct result of students opting to continue to the B.A.S. in Technology Management. However, students who achieve the A.A.S. in Computer Networking and Service Technology have a promising employment outlook.

Based on information from the Bureau of Labor Statistics and its *Occupational Outlook Handbook*, computer network support specialist is one of the jobs in Georgia that provides high pay but does not require education beyond an associate degree.

Computer Network Support Specialists

Experience in a related field: None

Georgia annual mean wage 2017: $69,740

A network support position is a good start towards other information technology positions. The job outlook for computer network support specialists includes an 11% growth in annual jobs between 2016 and 2026, which is faster than average. Additionally, many employers take applicants with an associate's degree.

Graduates that we are in contact with have found professional employment opportunities upon graduation, and there is a continuous open line of communication with local industry concerning the program to address ongoing industry and community needs to best equip our graduates. With the very favorable job outlook for graduates, the Computer Networking and Service Technology program continues to be a viable program. A new assessment plan will be put in place to aid in regularly collecting data regarding the success of graduates.

https://www.bls.gov/ooh/computer-and-information-technology/computer-support-specialists.htm

https://www.ajc.com/business/employment/hot-georgia-jobs-that-pay-more-than-50k-don-require-bachelor-degree/D0AM2L4ciBZY9TczNluyuK/ [Accessed 16 Apr. 2019]

Program Strengths and Weaknesses

Based upon this review, what are the strengths and weaknesses of the program?

Strengths:

- This program provides a strong foundation in the subjects of computer networking and security, giving students a solid foundation in Information Technology.
- Classes with real networking equipment provide students with a true network environment used by IT departments in industry.
- The faculty teaching in the program have years of experience in both teaching and using the technology.

Weaknesses and concerns:

- While there has been an increase in the number of students enrolled in the program, the number of degrees conferred has declined. This may be a direct result of students opting to continue to the B.A.S. in Technology Management.
- Due to the focus on networking and security, the class schedule is very rigid and allows no room for scheduling flexibility.
- Due to the focus on networking and security, the subject matter is very light on programming, database, and business technology skills.
- Very little data has been collected from graduates concerning their overall satisfaction with the program and their success after graduation.

Recommendations for Follow-Up and/or Action Plans (if needed)

Issue/Concern:

1. Add an Introduction to Cybersecurity course as an option to provide a bit more scheduling flexibility and provide students with cybersecurity skills.
2. The number of degrees conferred has declined.
3. Very little data has been collected from graduates concerning their overall satisfaction with the program and their success after graduation, and accurately measuring program outcomes and student learning outcomes at both the program and course level has been inconsistent.

Specific action(s):

1. Faculty members in the program will create the course and propose it to the School of Science, Technology, and Mathematics Curriculum Committee.
2. Faculty advisors in the program will investigate the decline in degrees conferred.
3. A new assessment plan will be put in place to aid in regularly collecting data for the overall assessment of the program and obtaining employment information through graduate surveys and better evaluation of program and course level outcomes.

Expected outcomes:

1. A cybersecurity course will provide more flexibility in the program and provide students with cybersecurity skills.
2. Determining the cause for the decline in degrees conferred will provide information on any necessary adjustments to the program.
3. New attention to the program and course level assessments along with surveys of graduates will aid in consistency and quality of data that is useful to the overall assessment of the program.

Time frame for achievement:

1. Course development will begin 2019-20.
2. Information will be sought beginning 2019-20.
3. A new assessment plan will be put in place, and this will be an ongoing process.

Person(s) responsible:

1. Primary responsibility lies with the leadership team made up of the dean, assistant dean, and the department chair. Faculty members in the program will create the course and propose it to the School of Science, Technology, and Mathematics Curriculum Committee.
2. Primary responsibility lies with the leadership team made up of the dean, assistant dean, and the department chair. Faculty advisors in the program will investigate and gather information.
3. Primary responsibility lies with the leadership team made up of the dean, assistant dean, and department chairs. Course level implementation of actions will lie with the faculty.

Resources needed:

1. None at this time
2. None at this time
3. None at this time

DALTON STATE

COMPREHENSIVE ACADEMIC PROGRAM REVIEW

Prepared by:

Signature Lee Ann Simmons **Date:** 05/10/2019

Dean's Approval:

Signature: [signature] **Date:** 5/10/2019

Approval of the Chair of the DSC Comprehensive Program Review Committee:

Signature: [signature] **Date:** 5/14/19

Vice President of Academic Affairs (VPAA) Categorical Summation:

Check any of the following to categorically describe action(s) the institution will take concerning this program.

☒ Program **MEETS** Institution's Criteria

- ☒ Program is critical to the institutional mission and will be retained.
- ☐ Program is critical to the institutional mission and is growing, or a high demand field, and thus will be enhanced.

☐ Program **DOES NOT MEET** Institution's Criteria for continuation.

- ☐ Program will be placed on monitoring status.
- ☐ Program will undergo substantive curricular revisions.
- ☐ Program will be deactivated.
- ☐ Program will be voluntarily terminated.
- ☐ Other (Please elaborate):

VPAA Signature: Pat Chute **Date:** 5/13/19

Patricia M. Chute, Ed.D.

Vice President of Academic Affairs

Dalton State College