

**Information Technology – Networking
CT² Agreement Survey Summary
July 19, 2007**

Executive Summary

Amended Substitute House Bill (H.B.) 66 mandated a system of guaranteed credit equivalency for technical courses that adhere to recognized industry standards. A Career-Technical Credit Transfer (CT²) five-step process (defining, agreeing, matching, submitting, and reviewing) was employed. The second step “agreeing” was defined as “educational partners reach a consensual agreement on the learning outcomes through a statewide feedback process.” To address the “agreeing” process step and obtain feedback on the recommendations, a web-based information technology (IT)-networking survey was disseminated mid-May, 2007 and closed June 5, 2007.

There were 42 respondents – 18 career-technical institutions and 24 higher education institutions (17 two-year and 7 four-year) responding to the IT-networking joint faculty panel recommendations for the following three types of networking CT² equivalent learning outcomes:

- basic
- networking
- vendor specific and neutral certifications

The learning outcomes of equivalent courses and other recommendations for guaranteed CT² credit formed a menu of options pertinent to the program content and design of secondary and adult career-technical institutions as well as the course content and design at higher education institutions.

Although there were a few suggestions on depth and breadth, there was strong agreement from both higher education and career-technical respondents on the basic and networking learning outcomes. There was less agreement with the “documentation of learning” recommendations. A number of respondents marked “don’t know” or “partially agree”. Overall, career-technical respondents stated agreement at higher levels than higher education respondents which may reflect a program design versus a course design. Agreement with recommended credit was noted - networking equivalent technical courses and courses focusing on vendor specific and neutral certifications preparation were more acceptable by higher education respondents than the credit recommended for basic level courses.

Comments from higher education included depth/breadth of basic learning outcomes; currency/relevancy/depth of assessments; consideration of other certifications; transcript documentation of certifications; course content concentration (one course vs. multiple courses); IT in engineering or other departments; performance evaluations; “canned” vs. theory based courses; instructor credentials/vendor certificates; industry certificate preference; and additional documentation needed for not passing the recommended assessment. Comments from career-technical included familiarity with credentials; limitations of some certifications - depth and availability to students vs. professionals; differences in college credit awarded; cost of vendor certificate assessments; and overall CT² positive statements of support.

In conclusion, the survey responses indicated the following regarding the recommendations of the IT-Networking faculty panel:

- The learning outcomes as drafted were accepted as equivalent course content.
- The area needing further information and clarification was the “documentation of learning” recommendations (end-of-program assessments and/or vendor specific/neutral certifications). External, third-party assessments were generally supported; however, the Ohio end-of-program assessment may not be known by many of the higher education respondents and/or vendor specific/neutral courses may not be offered by the higher education institution.
- The credit identified for all three types of courses was widely acceptable (100%) by career-technical respondents, but at a lesser rate (range from 86% to 100%) by the higher education respondents.

Based on the survey response, the IT-networking panel’s recommendations will proceed to the next stage - statewide implementation.

I. Background

Amended Substitute House Bill (H.B.) 66 directed the Ohio Board of Regents to work collaboratively with the Ohio Department of Education's Office of Career-Technical and Adult Education, public adult and secondary career-technical education, and state-supported institutions of higher education to establish criteria, policies, and procedures to transfer agreed upon technical courses from one system to another. The initiative is referred to as Career-Technical Credit Transfer or CT². H.B. 66 enables students to take equivalent technical courses anywhere within the public educational system and transfer technical credits without unnecessary duplication or institutional barriers. Technical courses identified as equivalent are to adhere to recognized industry standards and reflect agreed-upon knowledge and skills.

II. Recommendations and Learning Outcomes Development

In support of H.B. 66 and in an effort to formalize a statewide credit guarantee for equivalent technical courses, a five-step process was adopted that includes: 1) Defining – Faculty panels define learning outcomes based on recognized industry standards and 2) Agreeing – Educational partners reach a consensual agreement on the learning outcomes through a statewide feedback process. Steps three through five are the following: matching, submitting, and reviewing.

Joining faculty panels in mechanical/electrical engineering technology, nursing, medical assisting, and automotive technology, a selected group of information technology – networking educators and administrators articulated the learning outcomes needed to identify equivalent or common technical content of career technical (secondary and adult) and higher education information-technology courses. The panel's on-going work was recorded in a consensus document. The consensus document summarized and focused the thinking of the panel by outlining relevant information and requirements associated with transfer between career technical education and higher education in Ohio.

Recognized Industry Standards

Pertinent to H.B. 66 legislation, industry standards and certifications provide documentation of student learning. Recognized industry standards are expectations established by a business, industry, state agency, or professional association that define training program curriculum requirements, establishes certification or licensure criteria, and often is the basis for program accreditation. Information technology has multiple organizations developing and promoting standards, such as, networking businesses (Cisco or Microsoft) or non-profit industry associations (CompTIA) that represent the industry as a whole.

Technical Content Standards

As the career field technical content document that serves as the information technology curricular framework or technical standards for Ohio's College Tech Prep and career-technical education programs, *itWORKS.OHIO* was utilized to determine the networking learning outcomes. In 2005, building on the original 1999 *itWORKS.OHIO* document, the standards development was a collaborative effort of over 100 secondary and postsecondary educators, as well as, business and industry professionals. In addition to *itWORKS.OHIO*, the Accrediting Board of Engineering and Technology (ABET) defines standards for higher education networking programs and was considered in development of the recommendations of equivalent courses.

End-of-Program Assessments

The Ohio Career-Technical Competency Assessment (OCTCA), also known as Webxam, is an Ohio developed competency assessment system to measure technical competence as mandated by federal legislation. The state testing system offers end-of-program and modular type tests for students in qualifying career-technical secondary and adult programs. The information technology assessment measures the mastery of knowledge associated with *itWORKS.OHIO*. The state career-technical assessment system was considered as an end of program measure of student learning for basic and networking equivalent learning outcomes.

Learning Outcomes

The IT-Networking joint faculty panel made recommendations for three (3) types of networking CT² equivalent learning outcomes:

- basic
- networking
- vendor specific and neutral certifications.

The following learning outcomes were recommended for information technology-networking:

Basic

- 1.1. Demonstrate basic knowledge of information technology history and the future of information technologies.
- 1.2. Demonstrate basic knowledge of the information technology impact on society including security.
- 1.3. Demonstrate basic proficiency with computer tools and applications, such as, software installation, word processing, databases, spreadsheets, presentations, email, and Internet.

NetworkingHardware Design, Operation, and Maintenance

Identify and describe connectivity devices related to hardware design, operation, and maintenance.

Networking

- 2.2. Demonstrate knowledge of basic network classifications and topologies.
- 2.3. Demonstrate knowledge of local-area network trends and issues.
- 2.4. Demonstrate knowledge of network physical layer.
- 2.5. Demonstrate knowledge of network connectivity basics.
- 2.6. Demonstrate knowledge of networking protocol concepts
- 2.7. Demonstrate knowledge of the Open Systems Interconnection (OSI) standard (ISO Standard 7498).
- 2.8. Demonstrate knowledge of communication standards for networks.
- 2.9. Demonstrate knowledge of data encoding basics for networks.
- 2.10. Demonstrate knowledge of IP addressing schemes for networks.

Networking Architectures

- 2.11. Demonstrate knowledge of the basics of network architecture.
- 2.12. Demonstrate knowledge of the basics of Ethernet technology.
- 2.13. Demonstrate knowledge of the TCP/IP protocol suite details for networking architectures.

Network Operating Systems

- 2.14. Demonstrate knowledge of the network operating systems characteristics.
- 2.15. Install and administer network operating system and services.

Wide Area Networks

- 2.16. Demonstrate knowledge of basic telecommunications and the interconnection of networks.
- 2.17. Assess user needs for a wide-area network (WAN).
- 2.18. Design WAN systems for networks.

Network Management

- 2.19. Demonstrate knowledge of network management activities and procedures.
- 2.20. Demonstrate knowledge of network applications.
- 2.21. Perform network installation procedures.
- 2.22. Perform network maintenance and diagnostics and testing.

Telecommunications

- 2.23. Demonstrate knowledge of telecommunications transmission line applications.
- 2.24. Demonstrate knowledge of concepts and techniques used in working with communications systems.
- 2.25. Demonstrate knowledge of telecommunications networks.

Operating Systems

- 2.26. Provide for user authentication for security compliance
- 2.27. Apply systems operations procedures
- 2.28. Maintain and respond to system needs

Vendor Specific and Neutral Certifications

The knowledge and skills necessary to receive vendor specific certifications are determined by the networking certification sponsor. The information technology industry prescribes the content for vendor neutral certifications. Recommendations were made to standardize the process of CT² state guaranteed credit for networking courses preparing students for Cisco, Microsoft, and CompTIA certifications.

Cisco

Cisco prepares high school, adult, and higher education students for the Cisco Certified Networking Associate (CCNA) certification. CCNA is a comprehensive curriculum that includes four separate modules. The CCNA certification may be taken as a single comprehensive examination or individually as the Introduction to Cisco Networking Technologies (INTRO) and Interconnecting Cisco Networking Devices (ICND).

7/19/07 Note to Reader: Cisco is revising their certifications. CT² will be modified to reflect the revision.

Microsoft

Microsoft offers certifications for professionals who support, implement, and develop solutions using Microsoft technologies. Multiple exams are available which collectively can lead to various designations, such as, Microsoft Certified Systems Administrator (MCSA) or Microsoft Certified Systems Engineer (MCSE).

CompTIA

Representing the international technology community, CompTIA provides vendor-neutral information technology certification examinations. CompTIA certifications are frequently used by companies to validate foundation-level skill sets and guide development of educational program curriculum. Skills and knowledge are measured through recently updated assessments. To become A+ certified individuals must pass multiple examinations - CompTIA A+ Essentials and CompTIA A+ 220-602 as well either CompTIA A+ 220-603 or CompTIA A+ 220-604. The A+ Essentials examination validates knowledge of basic computer hardware and operating systems. 220-602 is targeted for individuals in a mobile or corporate technical environment with a high level of face-to-face client interaction while 220-603 examination focus is remote-based work environment and 220-604 examination focus is targeted to settings with a hardware related emphasis. As a vendor-neutral certification, CompTIA Network+ validates the knowledge and skills of networking professionals. The certification examination includes describing the features and functions of networking components and installing, configuring, and troubleshooting basic networking hardware, protocols, and services.

The learning outcomes of equivalent courses and other recommendations for guaranteed CT² credit formed a menu of options pertinent to the program content and design of the secondary and adult career-technical institution as well as the course content and design at the higher education institution. The following chart summarizes the recommendations for information technology – networking and were the basis for the electronic survey questions:

IT-Networking Joint Faculty Panel Recommendations

Learning Outcomes/Other Recommendations	Documentation of Learning/Certification	Guaranteed Credit
<p>IT – Basic</p> <p>3 equivalent learning outcomes derived from <i>itWORKS.OHIO</i></p> <p>Access credit within 3 years of completing program</p>	<p>Ohio Career-Technical Competency Assessment – IT Basics (Module 1) at the specified benchmark level</p> <p>or</p> <p>IC³ certificate (Computing Fundamentals, Key Applications, and Living Online components)</p> <p>or</p> <p>International Computer Driving License (ICDL) certificate</p>	<p>Equivalent introductory or application courses (1 or more) incorporating IT-basic learning outcomes = minimum of 3-4 quarter or 2-3 semester hours per course</p>
<p>IT – Networking</p> <p>28 equivalent learning outcomes reflect <i>itWORKS.OHIO</i> networking competencies</p> <p>Access credit within 3 years of completing program or within currency of certificate</p>	<p>Ohio Career-Technical Competency Assessment – IT Networking (applicable modules) at the specified benchmark level</p> <p>or</p> <p>CompTIA Network + certificate</p> <p>Or</p> <p>Cisco INTRO certificate</p>	<p>Equivalent networking courses (1 or more) incorporating IT-Networking learning outcomes 1 – 28 = minimum of 3-4 quarter or 2-3 semester hours per course</p>
<p>Cisco</p> <p>4 semester courses</p> <p>Current certification</p>	<p>INTRO examination, ICND examination, or CCNA certification</p> <p><i>7/19/07 Note to Reader: Cisco is revising their certifications. CT² will be modified to reflect the revision.</i></p>	<p>Minimum of 3-4 quarter hours/2-3 semester hours per course (12-16 quarter hours/8-12 semester hours for CCNA)</p>
<p>Microsoft</p> <p>Multiple courses</p> <p>Current certification</p>	<p>MCSA, MCSE</p>	<p>Minimum of 3-4 quarter hours/2-3 semester hours per course</p>
<p>CompTIA</p> <p>Multiple courses</p> <p>Certification within 3 years</p>	<p>CompTIA A+, CompTIA Network+</p>	<p>Minimum of 3-4 quarter hours/2-3 semester hours per course</p>

III. Agreement Surveys

As a key step in implementing H.B. 66 and its mandate to establish a system of credit equivalency, a web-based survey instrument was developed to solicit statewide input about the learning outcomes. In mid-May, 2007, higher education and career-technical institutions with IT-networking programs were invited to take the survey. Questions about the learning outcomes were grouped into three areas:

- basic
- networking
- vendor specific and neutral certifications.

Respondents were asked to review the learning outcomes and other recommendations, and to state their agreement or disagreement with the listed outcomes. Respondents could indicate their partial agreement with the outcomes as well and provide written comments. The following tables summarize their responses:

IT-Networking Survey Respondents

Total Respondents	Higher Education	Career-Technical*
42	24 – 57%	18 – 43%

Higher Education Respondents	Two-Year	Four-Year
24	17 – 71%	7 – 29%

Career-Technical Respondents*	JVS	City	Local	Exempted Village
18	11 – 61%	5 -28%	2 – 11%	0

* Secondary and adult workforce programs were not designated

IT-Networking Survey Response Overview for Basic

	Higher Education Agree –Disagree	Career-Technical Agree –Disagree
Learning Outcomes – Do the IT Basic learning outcomes represent the equivalent information technology knowledge and skills of introductory computer/technology application courses?	91% agree; 9% disagree	100% agree
Documentation, Assessment, Certification – The Ohio Career-Technical Competency Assessment, the IC ³ certificate, or the International Computer Driving License certificate are appropriate to document learning of information technology basic learning outcomes.	35% agree; 30% partial agreement; 35% don't know	78% agree; 11% partial agreement; 11% don't know
Credit – Information technology networking students meeting state learning outcomes for IT Basics will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses.	62% agree; 24% somewhat agree; 14% somewhat disagree	94% agree; 6% somewhat agree

Written survey comments for basic recommendations were as follows:

Which of the learning outcomes are not acceptable? Please list the outcome number(s). – 2 written responses

- The expected outcomes need to be more demanding. – Higher Education (2 Year)
- The listed outcomes are acceptable; however, the list is not complete enough. - Higher Education (4 Year)

Why are you not in agreement with the indicated learning outcomes? – 2 written responses

- Outcomes need to be broader and more in depth. – Higher Education (2 Year)
- UA's most recent outcomes include information literacy and ethics. These important topics are missing from the proposed list. . – Higher Education (4 Year)

The Ohio Career-Technical Competency Assessment, the IC3 certificate, or the International Computer Driving License certificate are appropriate to document learning of information technology basic learning outcomes. Please explain why you only partially agree or disagree with the previous statement. – 9 written responses

- The current OCTCA will need to be updated to reflect the current standards. - Higher Education (4 Year)
- Our college has a dynamic curriculum that changes software that may not be kept current with the competency assessment. If the assessment would be at currency with the marketplace we would be in full agreement. - Higher Education (2 Year)
- Depends upon the depth of knowledge desired. - Higher Education (2 Year)
- We are not familiar with the other assessments, only the OCTCA. - Career Technical
- The IC3 certificate, or the International Computer Driving License certificate are very easy to obtain and do not contain all of the basic technology learning skills. - Career Technical
- IC is very basic and does not demonstrate the required skills - Higher Education (2 Year)
- A combination of the groups and certificates listed in #15, 17 and 19 should ALL be included in this process. - Higher Education (2 Year)
- Courses in EET areas more in depth - Higher Education (2 Year)
- The Ohio Career-Technical Competency Assessment is not needed or desired. The other two listed are industry recognized, industry developed and standardized certifications and should be the standards to document learning. Higher Education (4 Year)

Information technology networking students meeting state learning outcomes for IT Basics will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses. Please explain why you disagree with the previous statement. – 3 written responses

- How will they be tested or will it be transcript viewed only? Unclear on credit granting process. - Higher Education (2 Year)
- It totally depends on the courses and curriculum at each institution. At our institution, we do not currently have one course that includes those topics - they are spread throughout several courses. - Higher Education (4 Year)
- Some content is missing. - Higher Education (2 Year)

IT-Networking Survey Response Overview for Networking

	Higher Education Agree –Disagree	Career-Technical Agree –Disagree
Learning Outcomes – Do the IT Networking learning outcomes represent the equivalent information technology knowledge and skills of networking courses?	96% agree; 4% disagree	100% agree
Documentation, Assessment, Certification – The Ohio Career-Technical Competency Assessment, CompTIA Network + certificate, or the Cisco INTRO certificate are appropriate to document learning of information technology networking learning outcomes.	68% agree; 18% partial; 14% don’t know	100% agree
Credit – Information technology networking students meeting state learning outcomes for IT Networking will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses.	76% agree; 19% somewhat agree; 5% somewhat disagree	94% agree; 6% somewhat agree

Written survey comments for networking recommendations were as follows:

Which of the learning outcomes are not acceptable? Please list the outcome number(s). – 1 written response

- 2.14 - 2.18 - Higher Education (2 Year)

Why are you not in agreement with the indicated learning outcomes? – 1 written response

- These are covered in an advanced course. - Higher Education (2 Year)

The Ohio Career-Technical Competency Assessment, CompTIA Network+ certificate, or the Cisco INTRO certificate are appropriate to document learning of information technology networking learning outcomes. Please explain why you only partially agree or disagree with the previous statement. – 4 written responses

- My concern is that the CompTIA and CISCO certificates are too narrow and do not address networking fundamentals in a broad way, and that these certificates represent specific training on their products only. Students need to learn more foundational topics and skills. - Higher Education (4 Year)
- I think a program using CISCO (for instance) could be adapted to reach this goal even though most programs do not require students to complete actual CISCO testing to get credit for the work- they simply prepare the student for actually achieving CISCO certification. - Higher Education (2 Year)
- A combination of the groups and certificates listed in #15, 17 and 19 should ALL be included in this process. - Higher Education (2 Year)
- The Ohio Career-Technical Competency Assessment is not needed or desired. The other two listed are industry recognized, industry developed and standardized certifications and should be the standards to document learning. - Higher Education (4 Year)

Information technology networking students meeting state learning outcomes for IT Networking will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses. Please explain why you disagree with the previous statement. – 1 written response

- same reason as before - depends on courses, curriculum and where topics are covered. Also, some programs in IT-Networking include courses in engineering technology and the IT dept cannot approve credit for courses in other departments. - Higher Education (4 Year)

**IT-Networking Survey Response Overview for Vendor Specific and Neutral Certifications
Cisco, Microsoft, CompTIA**

	Higher Education Agree –Disagree	Career-Technical Agree –Disagree
Documentation, Assessment, Certification – Cisco, Microsoft, and CompTIA certificates are all documentation of learning of vendor specific or neutral industry standards.	82% agree; 14% partial agreement; 5% don't know	100% agree
Cisco Credit – Information technology networking students meeting the Cisco certification requirements will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses.	81% agree; 19% somewhat agree	94% agree; 6% somewhat agree
Microsoft Credit – Information technology networking students meeting the Microsoft certification requirements will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses.	76% agree; 14% somewhat agree; 5% somewhat disagree; 5% disagree	89% agree; 11% somewhat agree
CompTIA Credit – Information technology networking students meeting the CompTIA certification requirements will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses.	75% agree; 15% somewhat agree; 5% somewhat disagree; 5% disagree	89% agree; 11% somewhat agree

Written survey comments for vendor specific and neutral certification recommendations were as follows:

Cisco, Microsoft, and CompTIA certificates are all documentation of learning of vendor specific or neutral industry standards. Please explain why you only partially agree or disagree with the previous statement. – 4 written responses

- What about other certifications? - Higher Education (2 Year)
- The Microsoft MCP certification more aligns with vendor specific technologies and would be obtainable to students. MCSE certification is a combination of seven (7) exams that only an industry professionals with real world experience would be able to obtain. - Career Technical
- A combination of the groups and certificates listed in #15, 17 and 19 should ALL be included in this process - Higher Education (2 Year)
- Only Cisco CCNA / CCNP covered in EET area - Higher Education (2 Year)

Information technology networking students meeting the Microsoft certification requirements will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses. Please explain why you disagree with the previous statement. – 0 written responses

Information technology networking students meeting the Microsoft certification requirements will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses. Please explain why you disagree with the previous statement. – 2 written responses

- Depends upon the Microsoft certifications - Higher Education (2 Year)
- Not Applicable as this is not offered - Higher Education (2 Year)

Information technology networking students meeting the CompTIA certification requirements will be granted a minimum of 3-4 quarter hours (2-3 semester hours) per course at higher education institutions offering equivalent courses. Please explain why you disagree with the previous statement. – 2 written responses

- Depends whether the certifications - Higher Education (2 Year)
- Not Applicable as this is not offered - Higher Education (2 Year)

Overall General Comments

Overall written survey general comments were as follows:

Career-Technical General Comments – 5 responses

- Obtaining university credit depends on that individual university's requirements. Therefore, it is sometimes difficult to determine if a university will grant absolute credit.
- I am glad to see a recognition of college credit for students showing competency in the Information Technology field.
- None
- At the high school level the cost of the vendor and vendor neutral testing is extremely costly therefore students who have financial needs may not be able to afford the testing. If schools are required to pay for these tests for their students this could potentially create financial connects for the district.
- Thank You ODE and House Bill 66 for giving our High School students credit for their hard work.

Higher Education (4 Year) General Comments – 2 responses

- The CT2 initiative can help standardize students transfer credits between Ohio Colleges. The use of external business and industry assessments is the key to this initiative. College technical courses that align with business and industry credentials should be used as end of course assessments (ECA). In courses that have identified business and industry credentials, college and dual-enrollment high school instructors should be required to hold the certification for courses that they teach. I think other free pre-employment information technology examinations like BrainBench's Networking Concepts and Computer Technical Support should be considered as possible ECAs. CompTIA also has the iNet+ certification that could be used for ECA of IT multimedia students.
- Since I was unsure whether the survey referred to Cisco Academy or Microsoft Academy student requirements or having completed the actual certification exams, I answered somewhat agree. Students having completed the independent vendor certification exams should be able to receive equivalent credit at the University. Students passing through a high school program that covers the material may not have mastered the material, even though they received a passing grade in the high school course or courses. These students may need to provide additional documentation to demonstrate that they are prepared.

Higher Education (2 Year) General Comments – 4 responses

- For questions # 8 and 12, which this survey skipped, about 70 to 79% of the learning outcomes are acceptable. Also, our institution does not have a basic networking course. Students go into either the first CISCO course or the first Microsoft course. A basic course may not have enough transferable material for us to count toward graduation requirements. If they pass national exams, they may receive more credit than the minimums specified.
- We had concerns that the test methods consist of multiple choice, objective exams rather than exams that test hands-on applied skills. These tests may not be a true measure of proficiency. Another concern is that the basic proficiency described for word processing, spreadsheet and database topics doesn't appear to be at a high enough level for the students to receive credit for our courses covering these topics. Our courses are taught to the Microsoft MOUS Level 1 certification criteria
- Meeting testing requirements of specialized programs such as CISCO, etc. may place students in an environment that is not general enough in theory, etc. to give them as complete a picture that they might get in curriculum not directed towards one of these "canned" programs- Cisco, Microsoft, etc. However, there are distinct advantages in taking an approach that has been proven successful in the "real world".
- Need to recognize other technology-based certifications

IV. Conclusion

In conclusion, the survey responses indicated the following regarding the recommendations of the IT-Networking faculty panel:

- The learning outcomes as drafted were accepted as equivalent course content.
- The area needing further information and clarification was the "documentation of learning" recommendations (end-of-program assessments and/or vendor specific/neutral certifications). External, third-party assessments were generally supported; however, the Ohio end-of-program assessment may not be known by many of the higher education respondents and/or vendor specific/neutral courses may not be offered by the higher education institution.
- The credit identified for all three types of courses was widely acceptable (100%) by career-technical respondents, but at a lesser rate (range from 86% to 100%) by the higher education respondents.

Based on the survey response, the IT-networking panel's recommendations will proceed to the next stage - statewide implementation.