

**Career and Technical Education
Adapted CTE Course Blueprint
of
Essential Standards and Indicators**

Trade and Industrial Education

7992 Computer Engineering Technology II

Public Schools of North Carolina
State Board of Education • Department of Public Instruction
Academic Services and Instructional Support
Division of Career and Technical Education
David Barbour, Project Director

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Contact T&leducation@dpi.state.nc.us for more information

Special thanks to the following educators who developed this Adapted CTE Course Blueprint.

*Todd Thibault
Tammy Bradley
Kathy Wright*

*West Johnston High School
Chapel Hill High School
West Montgomery High School*

This Adapted CTE Course Blueprint has been reviewed by business and industry representatives for technical content and appropriateness for the industry.

Adapted CTE Course Blueprint

Essential standards are big, powerful ideas that are necessary and essential for students to know to be successful in a course. Essential standards identify the appropriate verb and cognitive process intended for the student to accomplish. Essential standards provide value throughout a student's career, in other courses, and translate to the next level of education or world of work.

This document lays out the essential standards for CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702. CompTIA, the certifying organization, provides the standard to use in preparation for taking this exam and is used to write the essential standards. The essential standards use Revised Bloom's Taxonomy (RBT) category verbs (remember, understand, apply, analyze, evaluate, create) that reflect the overall intended cognitive outcome of the indicators written by CompTIA. Each essential standard and indicator reflects the intended level of learning through two dimensions; The Knowledge Dimension is represented with letters A-C, and the Cognitive Process Dimension by numbers 1-6.

The Adapted CTE Course Blueprint includes units of instruction, essential standard(s) for each unit, and the specific indicators aligned with the CompTIA certification. Also included are the relative weights of the units and essential standards within the course. The industry certification reflected in this document is CompTIA A+ Certification.

This document will help teachers plan for curriculum delivery for the year, prepare daily lesson plans, and construct valid formative, benchmark, and summative assessments. Curriculum for this course is not provided by NCDPI. Industry curriculum providers reviewed and approved for this course collaborated with the North Carolina Department of Public Instruction (NCDPI) to develop a valid and reliable test item bank used to produce a secure postassessment administered by NCDPI. Assessment for this course is written at the level of the **ESSENTIAL STANDARD** and assesses the intended outcome of the sum of its indicators. The following industry curriculum providers participated in the development of the secure test item bank. To assure alignment of the postassessment with the credential, the following curriculum providers have been reviewed and determined to provide curriculum to cover the essential standards. See appendix A for a list of curriculum providers.

For additional information about this blueprint, contact the Division of Career and Technical Education, North Carolina Department of Public Instruction, 6361 Mail Service Center, Raleigh, North Carolina 27699-6361.

Reference: Anderson, Lorin W. (Ed.), Krathwohl, David R. (Ed.), et al., *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Addison Wesley Longman, Inc., New York, 2001.

Interpretation of Columns on the NCDPI Adapted CTE Course Blueprint

No.	1	2	3	4
Heading	Essential Std #	Unit Titles, Essential Standards, and Indicators	Course Weight	RBT Designation
Column information	Unique course identifier and essential standard number.	Statements of unit titles, essential standards per unit, and specific indicators per essential standard. If applicable, includes % for each indicator.	Shows the relative importance of each unit and essential standard. Course weight is used to help determine the percentage of total class time to be spent on each essential standard.	Classification of outcome behavior in essential standards and indicators in Dimensions according to the Revised Bloom's Taxonomy. Cognitive Process Dimension: 1 Remember 2 Understand 3 Apply 4 Analyze 5 Evaluate 6 Create Knowledge Dimension: A Factual Knowledge B Conceptual Knowledge C Procedural Knowledge

Career and Technical Education conducts all activities and procedures without regard to race, color, creed, national origin, gender, or disability. The responsibility to adhere to safety standards and best professional practices is the duty of the practitioners, teachers, students, and/or others who apply the contents of this document.

Career and Technical Student Organizations (CTSO) are an integral part of this curriculum. CTSOs are strategies used to teach course content, develop leadership, citizenship, responsibility, and proficiencies related to workplace needs.

**Adapted CTE Course Blueprint for
7992 COMPUTER ENGINEERING TECHNOLOGY II**
(Recommended hours of instruction: 135 or 180 minimum)

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Course Weight	RBT Designation
1	2	3	4
	Total Course Weight	100%	
A	COMPUTER HARDWARE AND OPERATING SYSTEMS	72%	
X201.00	Apply procedures needed to install, configure and maintain computer systems.	38%	C3
	1.01 Given a scenario, install, configure and maintain personal computer components 10% 1.02 Given a scenario, detect problems, troubleshoot and repair/replace personal computer components. 10% 1.03 Given a scenario, detect problems, troubleshoot and repair/replace laptop components. 10% 1.04 Given a scenario, select and use the following tools: multimeters, power supply tester, specialty hardware / tools, cable testers, loop back plugs, anti-static pad and wrist strap, and extension magnets. 4% 1.05 Given a scenario, detect and resolve common printer issues. 4%		
X202.00	Apply procedures needed to install, upgrade, and troubleshoot computers' operating systems.	34%	C3
	2.01 Select the appropriate commands and options to troubleshoot and resolve problems. 9% 2.02 Differentiate between Windows Operating System directory structures (Windows 2000, XP Home, XP MediaCenter, Windows Vista Home, Home Premium, Business and Ultimate). 9% 2.03 Given a scenario, select and use system utilities / tools and evaluate the results. 8% 2.04 Evaluate and resolve common issues. 8%		
B	NETWORKING AND SECURITY	28%	
X203.00	Apply procedures needed to install, upgrade, and troubleshoot networks.	15%	C3
	3.01 Troubleshoot client-side connectivity issues using appropriate tools 8% 3.02 Install and configure a small office home office (SOHO) network 7%		
X204.00	Apply procedures needed to install, implement, upgrade, and troubleshoot security issues in computer systems.	13%	C3
	4.01 Given a scenario, prevent, troubleshoot and remove viruses and malware 7% 4.02 Implement security and troubleshoot common issues 6%		

Appendix A Credential Information

I. Credential name

CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702

II. Vendor(s) name and contact information

A. CISCO Learning Academy - <http://www.cisco.com/web/learning/netacad/index.html>

B. Heathkit - <http://www.carolinatraining.com/>

C. MarCraft - <http://www.seslabs.com/>

D. ExplorNet/The Centers for Quality Teaching and Learning - <http://www.qtlcenters.org/>

III. Use (desirability) of credential in industry

CompTIA A+ certification validates the latest skills needed by today's computer support professionals. It is an international, vendor-neutral certification recognized by major hardware and software vendors, distributors and resellers. CompTIA A+ certification confirms a technician's ability to perform tasks such as installation, configuration, diagnosing, preventive maintenance and basic networking. The exams also cover domains such as security, safety and environmental issues and communication and professionalism.

The **CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702** is targeted for individuals who work or intend to work in a technical environment with a high level of face-to-face client interaction. Examples job roles include: Enterprise Technician, IT Administrator, Field Service Technician, PC Technician. Ideally, the CompTIA A+ 220-602 candidate has already passed the CompTIA A+ Essentials examination. Candidates who pass both CompTIA A+ Essentials (2009 Edition) Exam Number: 220-701 and CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702 will be CompTIA A+ certified.

Individuals in careers that require IT knowledge outside of the formal IT job role, such as SMB office manager, technical sales roles or other non-technical roles that require understanding of computer repair issues may also find the validation of skills associated with the CompTIA A+ credential to be valuable.

CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702 Certification is the second of two CompTIA certifications exams required to obtain the **CompTIA A+ Certification** recognized by industry. The first required exam, **CompTIA A+ Essentials (2009 Edition) Exam Number: 220-702**, is taught in T&I course number **7991 Computer Engineering Technology I**.

IV. Impact on future employment opportunities

The **CompTIA A+ credential** validates the latest skills needed from today's computer support professionals. CompTIA A+ remains a skills benchmark that provides an entry point into an IT career and the industry standard to validate foundational skills. It also simplifies the professional development program for employers by allowing individuals to grow their careers into a specific area.

V. Cost of credential

The cost of this credential depends on the cost of vouchers that are purchased by the local LEA using the North Carolina E2C CompTIA Statewide membership. This usually results in a saving of 40% to 50% of the normal individual cost. Typical cost for the **CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702** exam is approximately \$140. With the E2C program it is typically \$75 per exam. Combining the cost of this certification with the cost of the required first certification exam to obtain the CompTIA A+ Certification, results in a cost of approximately \$150 per student using the NC E2C CompTIA Membership.

Due to the cost of certification, NCDPI and the listed vendors developed a common secured test item bank. This item bank consisted of test items from all participating vendors. Collaborative meetings were held with vendor representatives to validate the items for appropriateness in the development of a final exam for all vendors curriculum. These items were validated using NCDPI process. A final course exam will be generated by the NCDPI program area consultant and distributed using the same delivery channels for all CTE generated test. This exam will not have any additional cost to the LEA. The results from this NCDPI generated exam will be used for the students' technical attainment metrics.

Note: Some LEAs have opted to use the NCDPI generated assessment as a metric to determine who it will purchase CompTIA A+ voucher test for. This is to ensure funds are not spent needlessly.

VI. Description of how to obtain assessment test from vendor

A website has been prepared to assist in the process of obtaining student E2C CompTIA vouchers using the NC Statewide membership. This information can be found at the following site: <http://www.nc-ti.org/comptia.htm> . After reading this information, any additional questions can be addressed to the program area consultant by emailing your questions to T&Ieducation@dpi.state.nc.us.

VII. Description of state or national cut score standard AND reportable to state in data timeline

No National Industry Certification provides Pass/Fail rates nor cut scores. A system is in place, as part of the NC E2C program where by a form should be completed with Pass/fail information in addition to some demographic information as part of the requirement to use the E2C program. This information is also provided at: <http://www.nc-ti.org/comptia.htm> .

All students will be required to take the NCDPI generated final exam. Cut scores will be developed in accordance with all other NCDPI generated final exams.

The information from the LEAs that completed the E2C forms must be sent to the NCDPI program area consultant within one week of the students taking the CompTIA A+ Practical Application (2009 Edition) Exam Number: 220-702. Results of Pass/Fail are known by the students with a printout provided by the testing site at the conclusion of the exam. A copy of this printout should be attached to the students NCDPI E2C form completed to obtain the E2C voucher. This information will be compiled each semester as part of the Credentialing metric required by Perkins IV.

The information from the NCDPI generated exam will be handled in accordance with all other NCDPI generated exams.