

PC Hardware & Software Courses that Lead to A+ Certification

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Abstract:

In the light of growing demand from employers for IT certifications, Columbus State Community College's CIT department has redeveloped 2 courses designed to guide students to an A+ certification. This presentation will discuss the objectives of both courses in relation to CompTIA's exams and the benefits in linking courses to certifications. The PC Operating Systems class includes discussion of Windows 9x, NT, 200 and XP. Students learn how to install, troubleshoot and support each OS. Topics such as using windows on a network and the Internet are included. The OSI model is covered in detail, as well as hard drive support.

The PC Maintenance Course had been taught with hardware and operating system A+ objectives broadly covered. The redesigned course is designed specifically to teach the objectives of the CompTia A+ Core Hardware exam, including identifying, installing and troubleshooting hardware components. This presentation will discuss the redevelopment and linking of the courses, as well as the CompTIA objectives taught therein. We will be focusing on test competencies, courseware, and job opportunities. Sample A+ test questions and employment statistics will be provided.

A+ Certification Defined

The Computer Technology Industry Association (CompTIA) is a non-profit organization whose defined purpose is "fostering and growing the IT industry by promoting industry standards, growing professional IT expertise, providing IT skills education and developing relevant business solutions."

The CompTIA A+ certification is the industry standard for validating vendor-neutral skills expected of an entry-level computer technician. The intent of the certification is to ensure employers and consumers that A+ certificated technicians have a broad base of knowledge and competency in hardware and operating system software, and demonstrate abilities in installation, configuration, diagnosis, preventive maintenance and basic networking.

CompTIA is the largest developer of independent (non-proprietary) IT certification exams. Experts from industry, academia, training and government work with CompTIA to develop and re-develop tests that evaluate the skill sets required for certification, based on each group's content knowledge. More than 500,000 people have taken the A+ certification exams since 1993.

Why Focus on Certification?

The Computer Information Technology (CIT) department at Columbus State Community College learned, from a suggestion by the CIT Advisory Board, that local Columbus companies and government agencies had an interest in hiring employees with certifications, including A+. The department's advisory board includes members from Bank One, Nationwide Insurance Company, OCLC, Cardinal Health, Grange Insurance Co. and the State of Ohio. These members employ a sizable IT population in Columbus.

The advisory board meets twice a year to discuss various issues, including advising the department as to outcomes deemed appropriate for students desiring IT employment. These companies want to hire employees with an associate's degree and certifications, if possible. If left to choose, some feel that the associate's degree is more important because of the soft skills component, but more and more it seems that companies want certifications so they can spend less time and money on actual technical training.

To this end, the presenters took the initiative and upgraded the content of two courses, already in the degree curriculum, to guide students toward the A+ certification exams' objectives. The faults with the previous courses' content was that they were too general and did not address all competencies required of the A+ technician and sometimes did not connect with each other in a meaningful way. These courses have been in the department's plan of study for many years, but are now linked with each other, and courseware, to prepare students to sit for the exams. The two courses are MCT121 PC Operating Systems and MCT215 PC Maintenance.

Course Content

The MCT121 course uses the textbook, *A+ Guide to Software: Managing, Maintaining, and Troubleshooting* authored by Jean Andrews and published by Course Technology. The course's learning outcomes include:

- Describe the purpose and operation of the Disk Operating System (DOS); use the basic DOS commands and build batch files for automatic use of DOS.
- Describe the purpose and operation of Microsoft Windows, 9X, 2000, NT and XP and use this environment to work with Windows directories, folders and files.
- Support hard drives from a software point of view.
- Support and troubleshoot Windows on a network and the Internet.
- Explain the Linux and MAC operating systems.

The course is evaluated by a mid-term, final, and 18 hands-on projects. The hands-on projects include creating and administering a peer-to-peer network, using Windows XP and using diagnostic tools to troubleshoot system resources.

MCT 215 uses the companion textbook by Ms. Andrews—*A+ Guide to Hardware: Managing, Maintaining and Troubleshooting*. The outcomes of this course are:

- Identify the many different hardware components of a computer and explain their functions and interrelationships.
- Understand and explain how operating systems work with computer hardware.
- Measure electricity and understand the electrical system of the computer
- Identify various motherboards and motherboard components, and install and troubleshoot a motherboard.
- Identify and install peripheral I/O devices.
- Understand, upgrade and troubleshoot memory.
- Understand hard drive technologies and be able to install and trouble shoot hard drives (Including SCSI).
- Understand how networks are structured and how to connect PCs to a LAN.

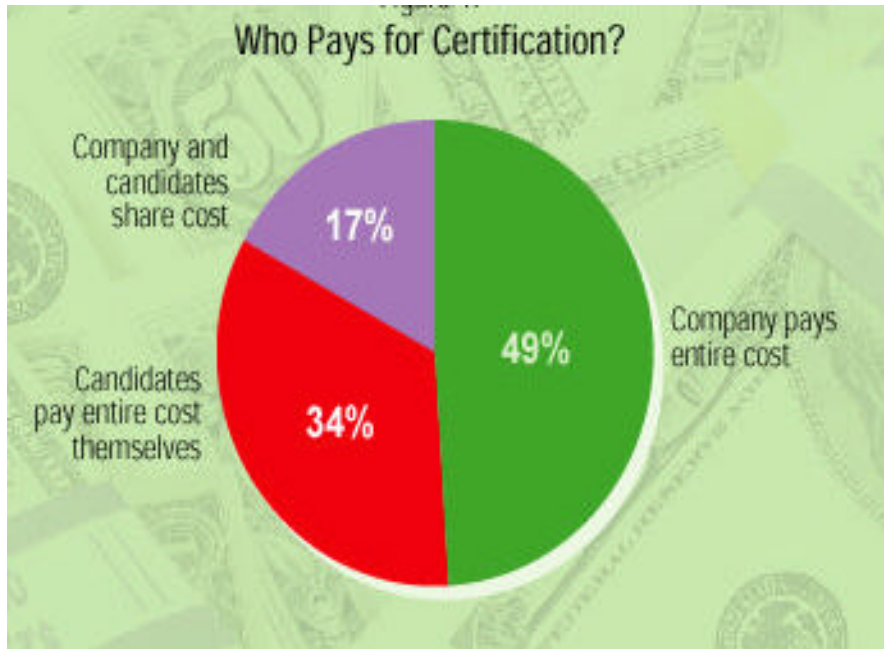
The hands-on assessment for this course is very practical and aimed at providing PC technical experience. In addition, theoretical exams are taken to provide a foundation for the terms, concepts, and competencies necessary for an A+ technician. The next section covers why we believe A+ certifications are beneficial to both organizations and the individual

Benefits of A+ Certifications

CompTIA has commissioned several market studies that look at the value of A+ certification among various groups. One study, conducted by Future Works, looked at the effect of A+ certification on people with low income, a population strongly represented at Columbus State. This study examined the training of young adults with little work experience and no higher education. Future Works used trainee interviews and visits to training facilities to gather information on the success of training.

Although the Future Works study found that these subjects were able to find good-paying jobs without prior work experience and higher education, some recommendations made by the researchers were that companies should provide more one-on-one mentoring, more hands-on experience and increased financial assistance to enable the subjects to realize the full benefits of the certification and to provide the greatest benefit to the employer. So-called “soft skills,” such as writing and presentation, need to be included to make trainees more fully rounded employees. Indeed, the CIT department at Columbus State is committed to its graduates having these skills. To this end, it is much more preferable that students complete a degree in addition to certification.

Another study, conducted by certmag.com, indicates that employees themselves understand the value of certification and are willing to pay for it when necessary or given the opportunity. The figure below shows the ratio of certificants who paid for at least some of their own certification was 51%, with the majority of those paying the entire cost.



This suggests that employees expect to derive economic benefit from certifications, and their expectations are well founded. As the next figure indicates, Certmag.com also found that salaries increased from a certification, even when the person already had the job.



The A+ certification is definitely entry level in the certification world, but is widely regarded as a stepping stone for additional certifications and provides a knowledge base for real world experience. The salary averages for the A+ certification have not dampened much in the IT slump of the last three years, and not all positions are being filled.

Certification Programs—Salaries at a Glance

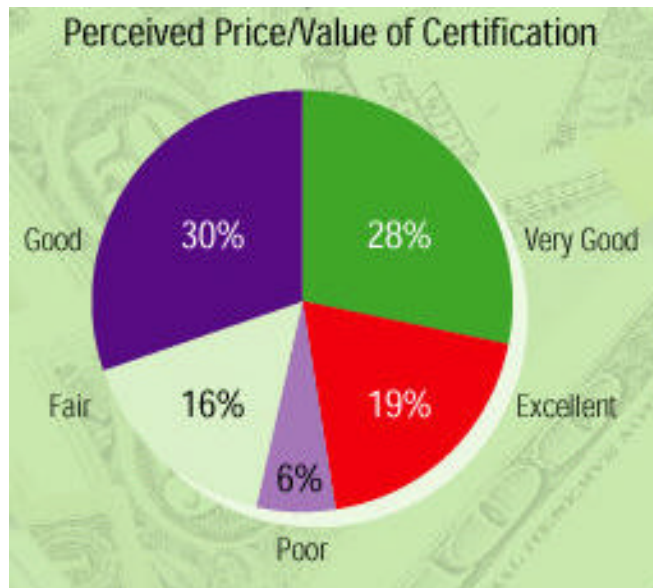
PROGRAM PROVIDER	CompTIA	PROSOFT	NOVELL	RED HAT
PROGRAM	A+	CIW	CNE	RHCE
ANNUAL SALARY	\$40,967	\$44,257	\$60,962	\$61,470
AVERAGE COST	\$300	\$2,394	\$2,847	\$2,357
AVERAGE 1ST YR RAISE	\$1,615	\$3,133	\$7,148	\$3,242
SALARY WITH EXPERIENCE				
<3 YEARS IN IT	\$37,291	\$36,789	\$39,999	\$45,650
3-5 YEARS IN IT	\$38,557	\$45,971	\$56,309	\$56,239
5-10 YEARS IN IT	\$46,249	\$54,117	\$58,604	\$64,832
10+ YEARS IN IT	\$49,820	\$62,082	\$66,015	\$78,630
SALARY WITH CERTIFICATIONS				
1 CERTIFICATION	\$37,670	\$44,125	\$57,352	\$57,999
2 CERTIFICATIONS	\$41,319	\$44,218	\$62,585	\$59,377
3+ CERTIFICATIONS	\$44,121	\$48,061	\$62,999	\$69,028

In another research effort, NFO Prognostics joined CompTIA in building a Web-based questionnaire that concentrated on A+ certification impact on career, benefits and job satisfaction. The questionnaire was sent to people certified in either A+, Network+, iNet or CDIA+. A total of 1147 people responded to the questionnaire. The researchers divided the respondents into four groups:

- Young, lower educated, getting started
- Older, self-employed/in career transition
- Young, professional/corporate
- Older, educated, professional/corporate

Respondents ranked “knowledge gain” and “credibility/validation of knowledge” highest among benefits gained from their certifications. They also highly ranked “certification meeting overall expectations” and “increased in effectiveness at your job after becoming certified.” Fully 85% of respondents would recommend certification programs. Sixty-five percent of respondents said their certification had “some impact on their career.” They wrote comments such as “increased knowledge,” “increased job opportunities” and “personal market value.”

The certmag.com survey echoes these results and found that 78% of respondents found their certification experience better than “Fair.”



CompTIA commissioned Harris Interactive to conduct a market study of unfilled IT positions in U. S. companies. The researchers conducted an online survey of IT and HR professionals in a variety of industries. They reported responses from 664 people. The objectives of the survey were to:

- Determine the level of interest in the proposed IT apprenticeship program
- Determine the IT career categories that are used in organizations
- Determine which positions are perceived as being entry-level
- Identify career clusters that may be industry-specific

The study found that there were an average of 14 unfilled IT positions in U.S. companies. The average number of entry-level positions is 8.5. Entry-level positions were considered to be help desk technicians, computer operators and PC technicians. The study also found that it takes an average of 6.6 months to train an entry-level employee and the average cost for external training is \$4,568 per employee.

Other findings include the fact that companies lose 12 IT employees to other companies every year and that firms reported that 8.1% of their IT staff performed unsatisfactorily. The researchers recommended addressing these shortages by creating IT apprentice programs that included course work in A+ certification.

Conclusion

The presenters have determined that A+ certification is beneficial to all parties involved and is indeed necessary for a graduate in an entry level IT position. Being a community college, Columbus State's focus needs to be on providing tools to the job seeker that will enable him or her to succeed and will give an employer the best possible product we have to offer.

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