

Morgan State University Cisco Regional Academy Update

09/25/06

The Cisco Networking Academy Program

- World-wide Program launched the ***Cisco Networking Academy Program*** about 10 years ago by Cisco Systems, Inc., to bring to schools basic knowledge and **hands-on skills** needed to network computers.
- Cisco Systems Inc., is a world leader in computer networking whose products make up over 75% of what makes the Internet infrastructure.
- Morgan State University has partnered with Cisco through the Morgan State Cisco Academy to bring the Networking Academy Program, primarily focused on **Baltimore City Public Schools (BCPSS)**

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The Academy Aligns with Morgan's Vision

CISCO SYSTEMS

Cisco Networking Academy Program Curriculum Roadmap

Welcome to the Cisco Networking Academy Curriculum Roadmap. The purpose of the roadmap is to assist you in determining the Academy curriculum that best meets the needs of your secondary educational institution's curriculum plan, to prepare students for a path to higher education or an entry-level career. Roll your mouse over each path sign to see a short description. Click on the High School to learn more about the curriculum.

The Morgan State University Cisco Academy works with Baltimore City Public Schools to extend computer and network technical education

U.S. Standards Alignment Database

HIGH SCHOOL

ENTER

ASSOCIATE of ARTS/BACHELOR ARTS DEGREES

ENTRY LEVEL CAREER

TECHNICAL/VOCATIONAL SCHOOL

ASSOCIATE of SCIENCE/BACHELOR of SCIENCE/ENGINEERING DEGREES

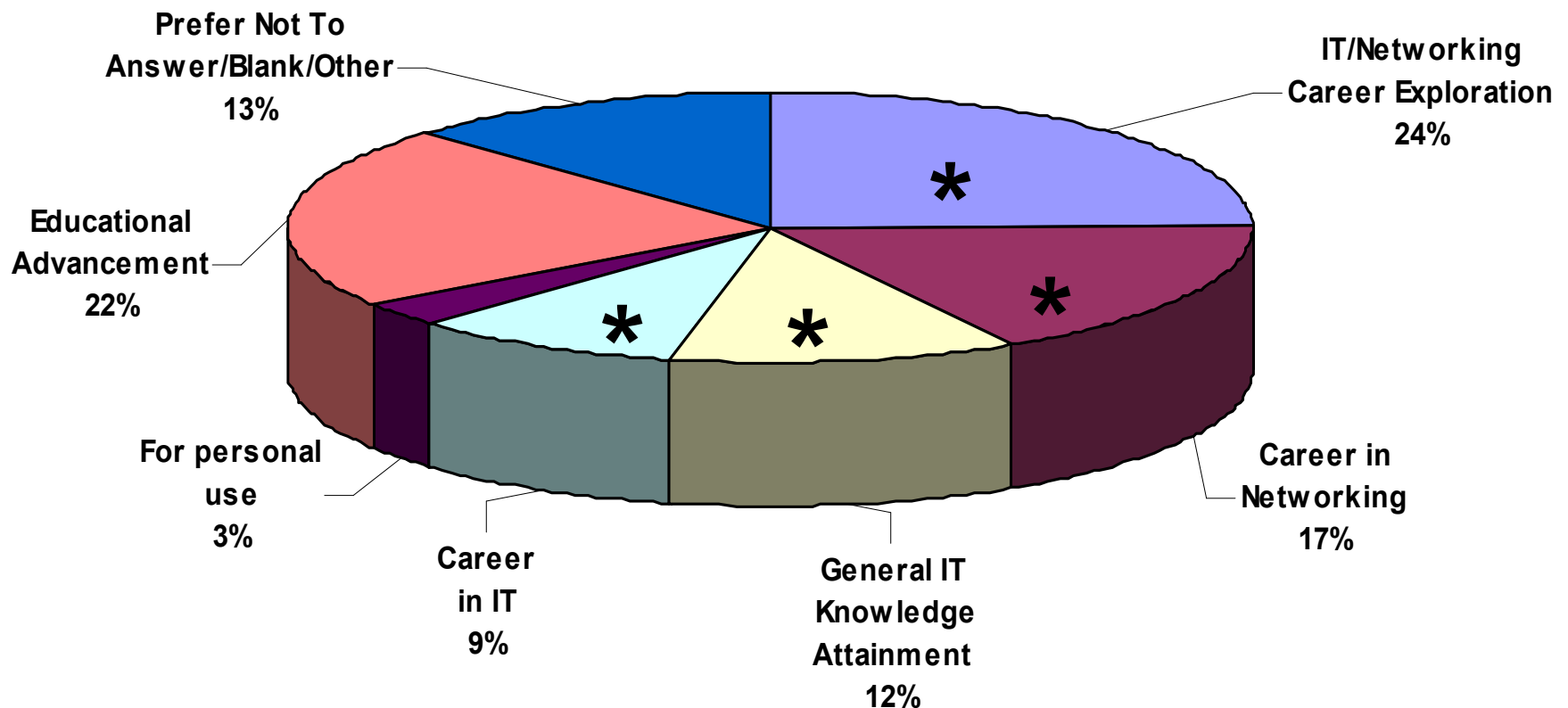
COMPUTER SCIENCES & ENGINEERING

INTERMEDIATE/ADVANCED CAREERS

The diagram illustrates a curriculum roadmap starting from a 'HIGH SCHOOL' building. A yellow path leads to a 'COMPUTER SCIENCES & ENGINEERING' sign, then to a 'TECHNICAL/VOCATIONAL SCHOOL' sign, and finally to a building labeled 'INTERMEDIATE/ADVANCED CAREERS'. Other paths lead to 'ENTRY LEVEL CAREER' and 'ASSOCIATE of SCIENCE/BACHELOR of SCIENCE/ENGINEERING DEGREES' signs, and another to 'ASSOCIATE of ARTS/BACHELOR ARTS DEGREES'.

Focus Student Outcomes and Impact

- Create Career Paths and Options for Students
 - Focus on obtaining job skills
- Aligns well with student goals today: ~65% desire IT skills



Source: Academy Connection, Student Profile Goal Question
Data Analyzed February 20, 2004 – CLI EMS Team

BCPSS Benefited from MSDOE Fast Track

Cisco **Fast Track** Program

Cisco Networking Academy Program Proposal Form

Maryland State Department of Education

Division of Career Technology and Adult Learning

200 West Baltimore Street

Baltimore, Maryland 21201-2595

This agreement is between the Division of Career Technology and Adult Learning (DCTAL), Maryland State Department of Education (MSDE), and the local school system listed below.

The Cisco Academy Offerings at BCPSS

Course Descriptions (Approved by Maryland State Dept of Education) as CTE Pathways I, II, and III.	Status/Results/where being conducted at BCPSS
<p><u>Course: IT Essentials I: PC Hardware and Software</u></p> <p>This course introduces students to information technology and data communications. Students will develop the necessary skills to enter this field by building a computer, installing the operating system, adding peripherals, connecting the computer to a local area network and to the Internet. This is a hands-on, lab-oriented course that stresses laboratory safety and working effectively in a group environment.</p>	<ul style="list-style-type: none"> • <u>New Course</u> Offered to students Fall '06 (10th grade -Fall) • <u>Teachers trained</u> this Summer '06. • This course being taught to <u>10th graders:</u> <ol style="list-style-type: none"> 1) Polytechnic 2) Digital Harbor 3) Edmondson WS 4) Mergenthaler 5) Northwestern HS 6) Carver

Course: IT Essentials II: Network Operating Systems

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This course is an intensive introduction to multi-user, multi-tasking networking operating systems. Characteristics of the Linux, Windows 2000, NT and XP network operating systems will be discussed. Students will explore a variety of topics including installation procedures, security issues, back up procedures and remote access.

- New Course To be offered to students **Spring '07 (10th grade - Spring)**
- Teachers trained this Summer '06.
- This course being taught to 10th graders:
 - 1) Polytechnic
 - 2) Digital Harbor
 - 3) Northwestern HS

Course: Panduit Network Infrastructure Essentials

Course: Panduit Network Infrastructure Essentials

This course addresses the basics of telecommunications and network cabling and wiring devices as well as suggested best practices and safety issues. The students, through hands-on activities and labs, learn to install horizontal (work area) and backbone cable. This hands-on, lab-oriented course stresses documentation, design, and installation issues, as well as laboratory safety, on-the-job safety, and working effectively in group environments. This course prepares students for the Panduit Authorized Installer (PAI) certification.

- New Course To be offered to students **Spring '07 (10th grade - Spring)**
- Teachers trained this Summer '06.
- This course being taught to 10th graders:
 - 1) Edmondson WS HS
 - 2) Megenthaler
 - 3) Northwestern HS
 - 4) Carver

Cisco Academy Offering: CCNA

Program Overview:

- *Cisco Certified Network Associate (CCNA)*, a 280-hour curriculum, is the first step in a Cisco career certification path. Particular emphasis is given to using **decision-making and problem-solving techniques** in the application of science, mathematics, communication and social studies concepts to solve networking problems.
 - Students will learn how to **install and configure Cisco switches and routers in multi-protocol networks using local- and wide-area networks (LANs and WANs)**, provide troubleshooting service, and improve network performance and security.
 - Additionally, instruction and training are provided in the proper care, maintenance, and use of networking software tools and equipment, as well as all local, state, and federal safety, building, and environmental codes and regulations.
 - **Taught at secondary and post-secondary levels**

CCNA1 – Typically taught at 11th grade

CCNA1 – Networking Basics Competencies

Upon completion of CCNA1, students have an understanding of networking basics including:

- Computer hardware and software, electricity, networking terminology, and protocols
- LANs and WANs, Open Systems Interconnection (OSI) model, Ethernet, and Internet Protocol (IP) addressing
- Design and documentation of a basic network and structured cabling
- Network-to-network communications

CCNA2 – Typically taught at 12th grade

CCNA2 – Routers and Routing Basics Competencies

Upon completion of CCNA2, students have an understanding of routers and routing including:

- Router user interfaces, components and configurations
- Basics of IOS versions, naming and software backup
- TCP/IP Protocol Suite and IP addressing and subnetting
- Interior routing protocols—RIP, IGRP

After completing CCNA1 and CCNA2 High School Students

- Can certify for 1st half of CCNA by taking exams at Prometric or Vue
- Complete the rest of CCNA (CCNA3 & CCNA4) as part of an undergraduate Engineering or Science program

Course: CCNA1 (Cisco Certified Network Associate – 1)

Course: CCNA1 (Cisco Certified Network Associate – 1)

This course is designed to provide students with classroom and laboratory experience in current and emerging networking technology that will empower them to enter employment or further education and training in the computer-networking field. A task analysis of current industry standards and occupational analysis was used to develop the content. Instruction includes, but is not limited to, networking, network terminology and protocols, network standards, local-area networks (LANs), wide-area networks (WANs), Open System Interconnection (OSI) models, cabling, cabling tools, routers, router programming, Ethernet, Internet Protocol (IP) addressing, and network standards. Particular emphasis is given to the use of decision-making and problem-solving techniques in applying science, mathematics, communication, and social studies concepts to solve networking problems. In addition, instruction and training are provided in the proper care, maintenance, and use of networking software, tools, and equipment and all local, state, and federal safety, building, and environmental codes and regulations.

This Course has been

offered since Fall '04.

- Teachers trained (Summer, '04, the rest in Fall '05/Spring '06, and a couple in Summer '06)
- This course being taught to 11th graders – All yr:
 - 1) Edmondson WS HS
 - 2) Digital Harbor HS
 - 3) Megenthaler
- Starting Spring '06 to 11th graders:
 - 4) Polytechnic
 - 5) Northwestern
 - 6) Carver

Course: CCNA2 (Cisco Certified Network Associate – 2)

Course: CCNA2 (Cisco Certified Network Associate – 2)

This course continues to provide students with classroom and laboratory experience in current and emerging networking technology that will empower them to enter employment or further education and training in the computer-networking field. A task analysis of current industry standards and occupational analysis was used to develop the content. Instruction includes, but is not limited to, the Open System Interconnection (OSI) Reference Model, local area networks (LANs), wide area networks (WANs), transmission control protocol/Internet protocol (TCP/IP) addressing, routers, router configuration, routing and routing protocols, internetwork open system (IOS) images and network troubleshooting. Particular emphasis is given to understanding the nature of and component of networks that make up LANs, WANs and the Internet. Students will become familiar with the use of command protocols that are used when configuring networks and will learn how to troubleshoot a 5-router topology.

This Course has been

offered since Fall '05.

- Teachers trained
(Summer, '05, the rest in Summer '06)
- This course being taught to 12th graders – All yr:
 - 1) Edmondson WS HS
 - 2) Digital Harbor HS
- Starting Fall '07 to 12th graders – All year:
 - 3) Polytechnic
 - 4) Mergenthaler

Morgan's Strategy for success w/ BCPSS

Vision, Strategy, Implementation Steps undertaken by Morgan State Cisco Regional Academy	Status/Results
<p>1. Morgan State started out with a vision that in part is discussed later in this report. Basically, the vision has been to establish a solid hands-on training opportunity for selected BCPS High Schools, not as an end in itself, but as a way to motivate young kids to continue to be interested in computer networking for the SOHO (Small Office/Home Office) environment and other related technical skills.</p>	<p>Solid success registered so far.</p>
<p>2. Trained the selected core teachers so that they can teach the networking technologies their respective high schools</p>	<p>A solid base of core trained teachers at BCPSS has been accomplished</p>
<p>3. Ensured that the networking labs benefit from best practices in having a conducive and supportive top quality and fully-equipped networking labs for students</p>	<p>Arranged best practice site visits to exemplary network academies in the DC-Baltimore area. Also conducted several Professional Days for teachers.</p>

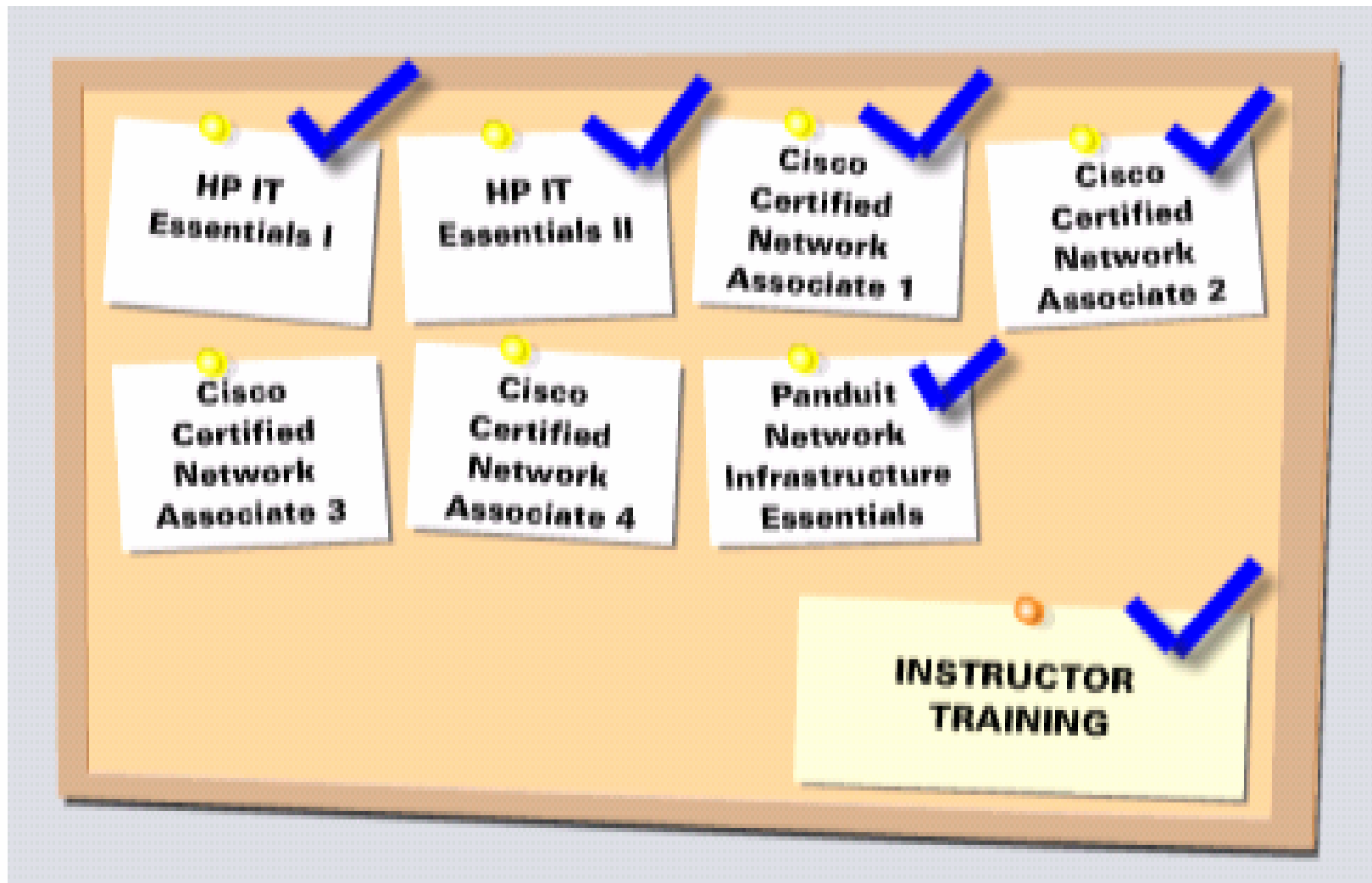
Morgan's Strategy for success with BCPSS (continued)

<p>4. Overcome with great determination and perseverance some of the problems faced by manpower turnover (eg. The resignation of the CTE director Sept, '06) and related problems at Baltimore City Public School System (BCPSS)</p>	<p>Successfully overcome a lot of the problems.</p>
<p>5. Convinced BCPSS to fund (in addition to the training of the instructors) state of the art Computer Networking Labs at six High Schools with advanced PCs, routers, switches and Networking testing tools and instruments</p>	<p>So far over \$300,000 has been invested by BCPSS on the Cisco Networking Local Academy Lab equipment at six high schools since Summer '04</p>
<p>6. Convinced Cisco to donate routers and switches to BCPSS high schools which have this Cisco Networking Academy Program going.</p>	<p>About \$90,000 worth of donation from Cisco to BCPSS so far – achieved through our concerted effort</p>
<p>7. Monitored and nurtured the growth of these networking academies despite manpower turnover and other multitude of issues that arise at BCPSS, and in particular, the Career and Technology Education Division</p>	<p>Without the constant monitoring, attention to detail, and guiding of Morgan, BCPSS may never have had any Cisco Networking Academies</p>

BCPSS Cisco Academy Pipeline ('05-'09)

Participating Baltimore City High School	IT Essentials I (Computer Installation and Repair) (Typically 10th graders)	PNIE – Network Infrastructure and Cabling Essentials (Typically 10th graders)	Cisco Certified Networking Academy (CCNA1) (Typically 11th graders)	Cisco Certified Networking Academy (CCNA2) (Typically 12th graders)
Edmondston Westside HS	Fall '06/Spring '07	Fall '06/Spring '07	Fall '05/Spring '06	Fall '06/Spring '07
Digital Harbor HS	Same as above	Same as above	Fall '05/Spring '06)	Fall '06/Spring '07
Mergenthaler Voc Tec	Same as above	Same as above	Fall '06/Spring '07	Fall '07/Spring '08
Northwestern	Same as above	Same as above	Fall '07/Spring '08	Fall '08/Spring '09
Carver	Same as above	Same as above	Fall '07/Spring '08	Fall '08/Spring '09
Polytechnic Institute	Same as above	IT Essentials II Spring '07	Fall '07/Spring '08	Fall '08/Spring '09

Cisco Programs in place and operational at six BCPSS High Schools



IT Technical Professional Job Titles

Networking Focus

- Help Desk Technician
- Customer Support Engineer
- System Administrator
- EDI Specialist
- Network Engineer
- Systems Engineer
- Operations Analyst
- Network Systems Analyst
- Systems Architect
- Infrastructure Manager
- Pre-sales Support
- Information Systems Auditor
- Network Research & Analysis Manager
- IT Engineer
- Network Manager
- Customer Support Engineer

- Web Technical Administrator
- Telecommunications Admin
- IT Architect
- Network Data Communications Technician
- Voice Communications Analyst
- VoIP Engineer/Architect
- Network Planning Analyst
- Network Security Engineer/ Manager
- Information Systems Security Manager
- PC & Network Support Technician
- Network Technician
- Network Administrator
- Field Engineer
- Desktop Support Technician
- Post-sales support
- Infrastructure Manager

Defining the Skill Set Within each Category

IT Support	Implementation & Maintenance	Generalist	Design	Specialty (Security, VoIP)
<p>Maintenance and troubleshooting of: Networks Servers Operating Systems Hardware Software</p> <p>Effectively question users to identify problem</p> <p>Work with frustrated users</p> <p>Prioritize problems</p> <p>Communicate with users (inperson and remote) about status and resolution</p>	<p>Install & deploy new networks</p> <p>Monitor and maintain network operations</p> <p>Troubleshoot network systems</p> <p>Implement/monitor network security</p> <p>Server/domain management</p> <p>Work as part of a team</p> <p>Effectively communicate with users</p>	<p>Design LAN/WAN systems</p> <p>Install & deploy new networks</p> <p>Maintain and monitor network operations</p> <p>Troubleshoot network systems</p> <p>Design, implement, and monitor network security</p> <p>Server/domain management</p> <p>Design, implement, and monitor communications systems</p> <p>Work as part of a team</p> <p>Effectively communicate with users</p> <p>Prioritize projects</p> <p>Work independently</p>	<p>Design LAN/WAN systems, including:</p> <p>Translate user requirements into network requirements</p> <p>Given a legacy network, develop a design to incorporate new devices</p> <p>Work as part of a team</p> <p>Effectively communicate with users</p> <p>Articulate benefits of network to business</p>	<p>Advanced networking tasks specific to area of specialty</p> <p>Work as part of a team</p> <p>Effectively communicate with users</p>

Cisco Certified Network Associate Components

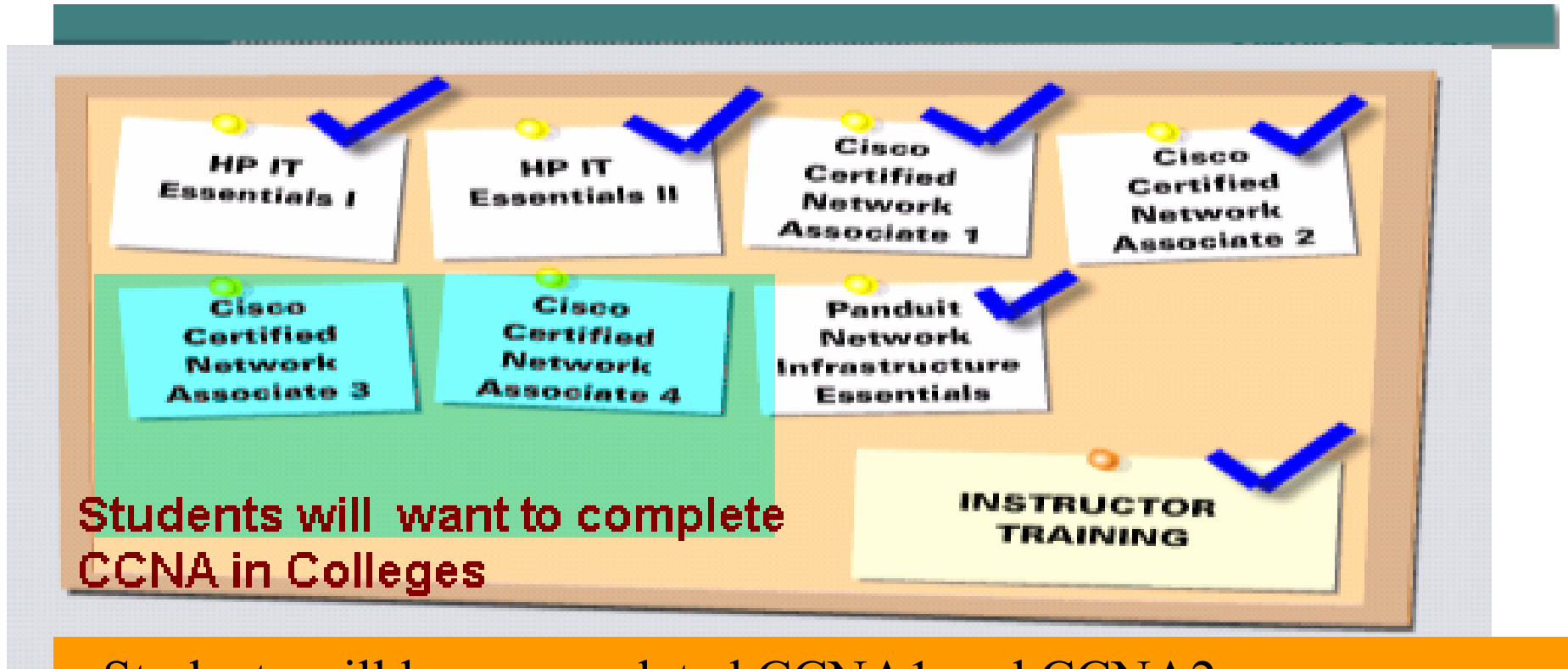
Credit Earned At High School:

- **CCNA1—Networking Basics**
- **CCNA2—Routers and Routing Basics**

Credit students can earn as part of College Studies

- **CCNA3—Switching Basics and Intermediate Routing**
- **CCNA4—WAN Technologies**

BCPSS Articulation Path with Colleges



- Students will have completed CCNA1 and CCNA2
- Would want assurance they can get credit for above (articulation)
- Would want to complete the rest of CCNA (CCNA3 and CCNA4)
- Challenge for Morgan: Integrate CCNA3&4 as part of Degree Programs or a separate certification effort or a combination