HAGERSTOWN COMMUNITY COLLEGE

Information Systems Technology & Cybersecurity Programs

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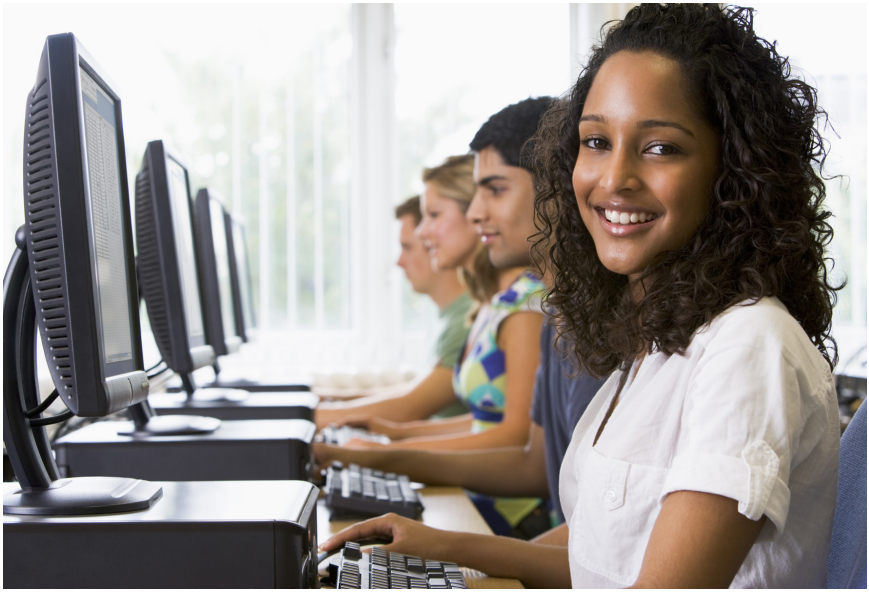

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Hagerstown Community College Information Systems Technology and Cybersecurity Programs

HAGERSTOWN COMMUNITY COLLEGE

WHY SHOULD I TAKE AN INTRODUCTION TO INFORMATION SYSTEMS COURSE AT HCC?

The world of computers and technology is constantly changing and evolving along with the opportunities for new and exciting jobs. The Information Systems Technology (IST) area offer several challenging and rewarding programs that will lead to new careers that range from computer gaming, computer science, developer (formerly programmer), support technician, security, forensics, and networking. In accordance with the Microsoft Academic Alliance Agreement, students are taught using current industry software at a free or nominal cost. By supplying the students with hands-on instruction, small classes, knowledgeable instructors, and a friendly learning environment, HCC offers superior learning that will lead to student success in terms of employment. In addition, HCC's tuition is affordable.

WHERE DO I START?

The prerequisite for most IST courses is IST 102: Introduction to Information Technology. This course provides students with an overview of what is available in the program options listed above. Students will also gain hands-on experience in software that they can apply in other required courses. After completing this course, students are ready to tackle advanced courses in their career path.

WHERE DO I GO FROM HERE?

A good starting point would be to contact a program coordinator about the area in which you're interested. They will help you map out a semester-by-semester plan that will allow you to complete your certificate or degree in the shortest amount of time possible. The lead program instructors are knowledgeable about national certifications that can be used in place of credit courses. Contact information is available at the end of each program description in this booklet. It's recommended that you contact a lead instructor or an academic advisor prior to starting at HCC.

BUILDING YOUR EDUCATION ONE STEP AT A TIME

Some programs offer a Letter of Recognition (LOR), which can be applied to a certificate or degree. The purpose behind LORs is to allow students to sample courses that are specific to a program. Students should not consider LORs to be the same as a certificate. LORs and certificates are a means of building courses that will lead to a degree. In addition, an A.S. degree (in the programs described within) is transferrable to a four-year institution. Some career paths require a four-year degree in order to obtain employment.

WHAT IS CYBERSECURITY?

Cybersecurity is the body of technologies, processes, and practices designed to protect networks, computers, programs, and data from attack, damage, or unauthorized access. In a computing context, the term "security" implies cybersecurity.

The amount that the government spends on information technology, and cybersecurity in particular, is expected to increase in 2015. The proposed budget increase will allot more than $13 billion to cyber programs.

WHAT DOES A COMPUTER SECURITY SPECIALIST DO?

Computer security specialists plan, coordinate, and maintain an organization's information security. These workers also educate users about computer security, install security software, monitor networks for security breaches, respond to cyber attacks, and, in some cases, gather data and evidence to be used in prosecuting cyber crime. Computer security specialists are expected to protect computers and servers from damage caused by viruses, unauthorized access, deletion, or theft of important and private information (source: *www.bls.gov/ooh*).

Individuals who excel in this field typically exhibit good critical thinking skills (including complex problem solving) as well as the ability to communicate effectively, exercise good judgment and decision making, and appropriately manage their time.

WHAT IS THE EMPLOYMENT OUTLOOK?

According to the U.S. Bureau of Labor Statistics, employment of network and computer systems administrators is expected to increase by 37 percent from 2012 to 2022, much faster than the average for all occupations. Demand for information security analysts is expected to be very high as these analysts will be needed to come up with innovative solutions to prevent hackers from stealing critical information or creating havoc on computer networks (source: *www.bls.gov/ooh*).

For more information about HCC graduation rates, the median debt of students who completed the program, and other important information, visit *www.hagerstowncc.edu/cyber.*

WHAT ARE THE AVERAGE EARNINGS?

Earnings will vary depending on experience, education, certifications, geographic location, and duties. Median annual wages of network and computer systems administrators were $86,170 in 2012. The lowest 10 percent earned less than $49,960, and the highest 10 percent earned more than $135,600 (source: *www.bls.gov/ooh*).

In 2013, the median annual wage of Maryland cybersecrity workers was $95,500 compared to the national average of $88,600 (source: *www.careerinfonet.org*).

WHY SHOULD STUDENTS CHOOSE HCC?

• HCC is the regional leader in cybersecurity programming. The college currently offers two associate degrees in cybersecurity and a number of specialized certificates.

• In 2010, HCC was one of the first community colleges in the nation to be named as a Center of Academic Excellence for Two-Year Education in Information Assurance (CAE2Y).

• HCC has aligned many of its cybersecurity courses with Cyberwatch, a consortium of over 40 colleges, businesses, and govern¬ment agencies. This alignment allows students to transfer seamlessly from HCC to a four-year college to complete their bachelor's degrees.

• Upon program completion, students will be prepared for several industry standard certification exams including:

– CompTIA A+, Network +, Security +

– EC Council Security 5, Network 5, E|NSA, C |EH (Certified Ethical Hacker)

• Maryland is ranked second in the nation for the highest annual wages for computer security specialists. Fifty-one cybersecurity companies recently relocated to Maryland, which will bring 5,000 new jobs to the state. Students who train at HCC will be well-placed to transition to the cybersecurity field.

HOW DO I GET MORE INFORMATION?

Contact:
Steve Shank
Professor, Information Systems Technology
240-500-2536
spshank@hagerstowncc.edu

A.A.S. Degree
Cybersecurity

The career program in cybersecurity is designed for students who plan to enter the field of information security. Major areas of study include network fundamentals, ethics, penetration testing, computer forensics, and operating systems.

General Education Requirements **21 credits**

Arts/Humanities
Select a course from approved General Education course list 3

Behavioral/Social Sciences
Select a course from approved General Education course list 3

Biological/Physical Science
Select a course from approved General Education course list 3

Diversity
Select a course from approved General Education course list 3

English
ENG 101 English Composition 3
ENG 112 Technical Writing 3

Mathematics
MAT 101 College Algebra 3
OR
Any higher level Mathematics course ..... (3)

Program Requirements **38 credits**

CYB	101	Introduction to Cybersecurity	3
CYB	210	Ethics in the Information Age	3
CYB	225	Tactical Perimeter Defense	3
CYB	240	Ethical Hacking Fundamentals	3
CYB	245	Introduction to Penetration Testing	3
IST	108	Microsoft Operating System	3
IST	109	UNIX/LINUX Operation System	3
IST	154	Networking Basics	3
IST	155	Networking I	4
IST	156	Networking II	4
IST	160	Introduction to Security Fundamentals	3
IST	261	Server Management I	3

Free Electives **1 credit**
Electives should be selected in consultation with an advisor to satisfy career goals or a transfer college curriculum

Degree Requirement 60

A.S. Degree

Cybersecurity

The transfer program in cybersecurity is designed for students who plan to transfer to a four-year institution and major in cybersecurity, information assurance, or a related field. Students should identify an intended transfer institution as early as possible and complete appropriate courses. Students should always confer with advisors and transferring institutions for specific requirements as these are subject to change.

General Education Requirements **31-32 credits**

Arts/Humanities
Select two courses in different disciplines from approved General Education course list 6

Behavioral/Social Sciences
Select two courses in different disciplines from approved General Education course list 6

Biological/Physical Science
Select two courses from approved General Education course list-
One must include a laboratory course 7-8

Diversity
Select a course from approved General Education course list 3

English
ENG 101 English Composition 3
Select another ENG course from approved General Education course list 3

Mathematics
MAT 101 College Algebra 3

OR

Any higher level Mathematics course ..... (3)

Program Requirements **21 credits**

CSC	132	Introduction to C and C++ Programming 3
CYB	101	Introduction to Cybersecurity 3
CYB	210	Ethics in the Information Age 3
CYB	225	Tactical Perimeter Defense 3
IST	154	Networking Basics 3
IST	160	Introduction to Security Fundamentals 3
IST	166	Computer Forensics I - Principles and Practices 3

Restricted Electives **6 credits**

Electives should be selected in consultation with an advisor to satisfy career goals or a transfer college curriculum. Select six credits from the following list:

ADJ	101	Introduction to Criminal Justice 3
CSC	232	Advanced C++ Programming 3
CYB	240	Ethical Hacking Fundamentals 3
IST	266	Computer Forensics II – Investigations Practices 3

Free Electives **2 credits**

Electives should be selected in consultation with an advisor to satisfy career goals or a transfer college curriculum.

Degree Requirement 60

Certificate

Cybersecurity: Advanced Network Security

The certificate program in advanced network security is designed for students who have completed the requirements for a certificate in network security. Students who complete this program will gain knowledge to prepare for industry certification examinations. Currently, training for national certifications is part of this program: CSP's Security Certified Network Specialist and Security Certified Network Professional; and EC Council's Certified Ethical hacking. Students may continue on to other certificates or degrees in cybersecurity.

Program Requirements			**1 credits**
CYB	101	Introduction to Cybersecurity	3
CYB	210	Ethics in the Information Age	3
CYB	225	Tactical Perimeter Defense	3
CYB	240	Ethical Hacking Fundamentals	3
CYB	245	Introduction to Penetration Testing	3
IST	102	Introduction to Information Technology	3
IST	154	Networking Basics	3
Certificate Requirement			**21**

Certificate

Cybersecurity: Cisco CCNA Prep

The certificate program in network security is designed for students interested in a career in network security. Students who complete this program will gain knowledge to prepare for industry certification examinations. Currently, two national certifications are part of this program: CompTIA Network+ and Security+. Students may continue on to other certificates or degrees in cybersecurity.

Program Requirements			**25 credits**
IST	102	Introduction to Information Technology	3
IST	108	Microsoft Operating System	3
IST	154	Networking Basics	3
IST	155	Networking I	4
IST	156	Networking II	4
IST	255	Networking III	4
IST	256	Networking IV	4
Certificate Requirement			**25**

Certificate

Cybersecurity: Network Security

The certificate program in network security is designed for students interested in a career in network security. Students who complete this program will gain knowledge to prepare for industry certification examinations. Currently, three national certifications are part of this program: CompTIA Network+ and Security +; and Cisco Certified Entry Networking Technician. Students may continue on to other certificates or degrees in cybersecurity.

Program Requirements			**20 credits**
IST	102	Introduction to Information Technology	3
IST	108	Microsoft Operating System	3
IST	154	Networking Basics	3
IST	155	Networking I	4
IST	156	Networking II	4
IST	160	Introduction to Security Fundamentals	3
Certificate Requirement			**20**

A.A.S. Degree

Information Systems Technology

The Information Systems Technology Program is designed to give students the opportunity to choose the area of technology most appealing to them. Students earn the A.A.S. degree in information systems technology by specializing in a concentration. This curriculum is for students interested in the following: computer forensics, computer support, developer, networking technology, and simulation and digital entertainment. Students who select one of these concentrations and wish to transfer to a four-year institution, or who are interested in computer science, should consult an academic advisor. Completion of the information systems technology degree must be within four years of the current college catalog due to constantly changing technology. Students who do not complete their degree requirements within four years will fall under the latest catalog. Courses with (CW 150) in the title are HCC courses that have been aligned with the Cyberwatch curriculum.

General Education Requirements* **21-23 credits**

Arts/Humanities
Select from approved General Education course list 3

Behavioral/Social Sciences
Select from approved General Education course list 3

Biological/Physical Science
Select from approved General Education course list 3-4

Diversity
Select from apporved General Education course list 3

English

ENG	101	English Composition	3
ENG	102	Composition and Literature	3
		OR	
ENG	112	Technical Writing I	(3)

Mathematics

MAT	101	or another MAT course from approved list	3-4

**Please note Computer Forensics concentration requires specific General Education requirements. See page 11 for more information.*

Program Requirements
Choose one of the three concentrations:

1. Computer Forensics *(pages 8-9)*
2. Computer Support Specialist *(pages 10-12)*
3. Network Administration *(pages 14-16)*

WHAT IS COMPUTER FORENSICS?

Computer forensics is the process of acquiring, examining, and reporting of digital evidence within the legal system. It incorporates the methodical examination of computer media as well as network components, software, and memory for evidence. Computer forensics is also referred to as system forensics, digital forensics, computer forensics analysis, electronic discovery, data recovery, and computer analysis.

WHAT DO COMPUTER FORENSICS TECHNICIANS DO?

A computer forensics technician looks for evidence on hard disks, tapes, compact disks, flash drives, and other media. A skilled forensics specialist should be able to conduct a thorough analysis to reconstruct a user's activities on a single device or across a network or the Internet and often uses evidence to reconstruct past events or activities. Forensics specialists use evidence to gain a better understanding of crimes through the handling of digital data, and are able to show use or abuse of information technology hardware, software, and services and to prove policy violations or illegal activity.

WHAT IS THE EMPLOYMENT OUTLOOK FOR THIS CAREER?

According to the U.S. Bureau of Labor Statistics, employment of network and computer systems administrators is expected to increase by 37 percent from 2012 to 2022, much faster than the average for all occupations. Demand for information security analysts is expected to be very high as these analysts will be needed to come up with innovative solutions to prevent hackers from stealing critical information or creating havoc on computer networks (source: *www.bls.gov/ooh*).

For more information about HCC graduation rates, the median debt of students who completed the program, and other important information, visit *www.hagerstowncc.edu/computer-forensics*.

WHAT ARE THE AVERAGE EARNINGS?

Earnings will vary depending on experience, education, certifications, geographic location, and duties. Median annual wages of network and computer systems administrators were $86,170 in 2012. The lowest 10 percent earned less than $49,960, and the highest 10 percent earned more than $135,600 (source: *www.bls.gov/ooh*).

WHY SHOULD I CHOOSE HCC?

The computer forensics concentration is designed to provide an introduction to the forensic investigation aspect of computers and related electronic data systems. The program includes an overview of forensic evidence collection methods, investigative techniques, and procedures suitable for persons exploring the computer forensics field as a career option. Those students interested in pursuing a career in a highly-specialized field can transfer credits to four-year colleges offering degree programs in computer forensics. Students can also use the computer forensics option as a second degree to enhance career advancement.

HOW DO I GET MORE INFORMATION?

Contact:
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240-500-2536
spshank@hagerstowncc.edu

Concentration I:

Computer Forensics

The career program in computer forensics is designed for students who plan to enter the field of data recovery, computer forensic investigation, or related fields. Major areas of study include criminal justices, computer forensics, network fundamentals and operating systems. This degree must be completed within four years because of constantly changing technology. Students who do not complete within four years will fall under the latest catalog. Students should always confer with advisors for specific requirements as these are subject to change.

General Education Requirements **21 credits**

Arts/Humanities

Select from approved General Education course list 3

Behavioral/Social Sciences

SOC 101 Introduction to Sociology 3

Biological/Physical Science

Select from approved General Education course list 3-4

Diversity

Select from approved General Education course list 3

English

ENG 101 English Composition 3
ENG 112 Technical Writing I 3

Mathematics

MAT 101 College Algebra 3

Program Requirements **36 credits**

ADJ 101 Introduction to Criminal Justice 3
ADJ 203 Criminal Law 3
ADJ 204 Criminal Investigation 3
CYB 210 Ethics in the Information Age 3
IST 102 Introduction to Information Technology 3
IST 108 Microsoft Operating System (CW 130) 3
IST 150 PC Tech: Repair and Troubleshooting 3
IST 151 PC Tech: Operating Systems 3
IST 154 Networking Basics 3
IST 166 Computer Forensics I—Principles and Practices 3
IST 266 Computer Forensics II—Investigations Practices 3
SOC 103 Criminology 3

Restricted Electives **3 credits**

Approved courses are listed below. Electives should be selected in consultation with the Technology and Computer Studies Division to satisfy career goals and/or transfer college requirements.

ADJ 205 Forensic Science for Criminal Justice ..... (3)
BTC 101 Introduction to Biotechnology ..... (3)
CYB 101 Introduction to Cybersecurity. ..... (3)
CYB 240 Ethical Hacking Fundamentals ..... (3)
IST 109 UNIX/Linux Operating System (CW 140) ..... (3)
IST 140 Fundamentals of Wireless Computing ..... (3)
IST 160 Introduction to Security Fundamentals (CW 160) ..... (3)
IST 261 Server Management I ..... (3)
IST 269 Internship I ..... (3)

Degree Requirement 60

This degree must be completed within four years because of constantly changing technology. Students who do not complete within four years will fall under the latest college catalog.

WHAT IS THE COMPUTER SUPPORT SPECIALIST PROGRAM?

The computer support specialist degree provides students with the skills to build, troubleshoot, and repair microcomputer systems; install operating systems; diagnose and troubleshoot faulty operating systems; install, use and assist others with software applications; set-up small networks; write script and batch files; and provide end-user support.

Through the course of the program, students develop troubleshooting and problem-solving skills, customer service skills, and critical thinking skills. Students gain experience through simulation, hands-on activities, and interaction in real-world computer repair clinics. The curriculum prepares students for the following certifications:

- CompTIA A+, Network+
- MOS
- MTA, MCTS, MCITP*
- Cisco Certified Network Associate (CCNA)*

** dependent upon electives taken*

Students earning the IST: Option in Computer Support Specialist associate's degree are prepared to enter these jobs:

- Computer support specialist
- Help desk technician/analyst
- IT specialist
- Network support specialist/technician
- Computer technician

WHAT IS THE EMPLOYMENT OUTLOOK FOR THIS CAREER?

Employment of computer support specialists expected to increase by 17 percent from 2012 to 2022, faster than the average for all occupations (source: *www.bls.gov/ooh*). Expect high growth of positions in the health care industry and in firms using cloud computing.

For more information about HCC graduation rates, the median debt of students who completed the program, and other important information, visit *www.hagerstowncc.edu/computer-specalist.*

WHAT ARE THE AVERAGE EARNINGS FOR THIS CAREER?

Earnings will vary by location, education, and experience. Median annual wages of wage-and-salary computer support specialists were $46,420 in May 2012. The lowest 10 percent earned less than $27,620, and the top 10 percent earned more than $77,430 (source: *www.bls.gov/ooh*).

WHY SHOULD I CHOOSE HCC?

- Students are provided with hands-on learning experiences: building and repairing systems; troubleshooting computers brought in from the local community and current student population; and setting up networks
- Other courses offer job-shadowing opportunities at help desks and IT departments, as well as the opportunity to participate in team projects in real working environments
- Local internships with both small and large companies
- Students have the opportunity to join the Information Technology Association (ITA), which allows students to participate in monthly meetings, field trips, and computer CPR clinics

HOW DO I GET MORE INFORMATION?

Contact:
Karen Weil-Yates
Assistant Professor, Information Systems Technology
240-500-2446
kdweil-yates@hagerstowncc.edu

Concentration 2:

Computer Support Specialist

The computer support specialist concentration provides students with the skills necessary for a career in the computer support field. Courses will concentrate on current packages for word processing, spreadsheets, database management, Internet access, presentation, and Web publishing. Two different operating systems will also be covered. Classes are conducted in hands-on labs. Upon completion of the program, students will be prepared for MCSA, A+, and Net+ certification exams.

General Education Requirements **21-23 credits**

(see page 7)

Program Requirements **35 credits**

BUS	145	Customer Service	1
IST	102	Introduction to Information Technology	3
IST	103	Presentation Software	1
IST	105	Fundamentals of Word Processing	3
IST	106	Spreadsheet Software	3
		OR	
IST	107	Database Management	3
IST	108	Microsoft Operating System (CW 130)	3
IST	109	UNIX/Linux Operating System (CW 140)	3
IST	150	PC Tech: Repair and Troubleshooting	3
IST	151	PC Tech: Operating Systems	3
IST	154	Networking Basics	3
IST	204	Help Desk Technology and Services	3
IST	261	Server Management I	3
WEB	101	Web Design I	3

Restricted Electives **3-4 credits**

Approved courses are listed below. Electives should be selected in consultation with the Technology and Computer Studies Division to satisfy career goals and/or transfer college requirements.

IST	106	Spreadsheet Software	(3)
IST	107	Database Management	(3)
IST	160	Introduction to Security Fundamentals (CW 160)	(3)
IST	166	Computer Forensics I—Principles and Practices	(3)
IST	253	TCP/IP	(3)
IST	262	Windows Network Infrastructure	(2)
IST	264	Server Management II	(3)
IST	269	Internship I	(3)

Degree Requirement **60**

Learn about the certificate option on page 12.

Certificate

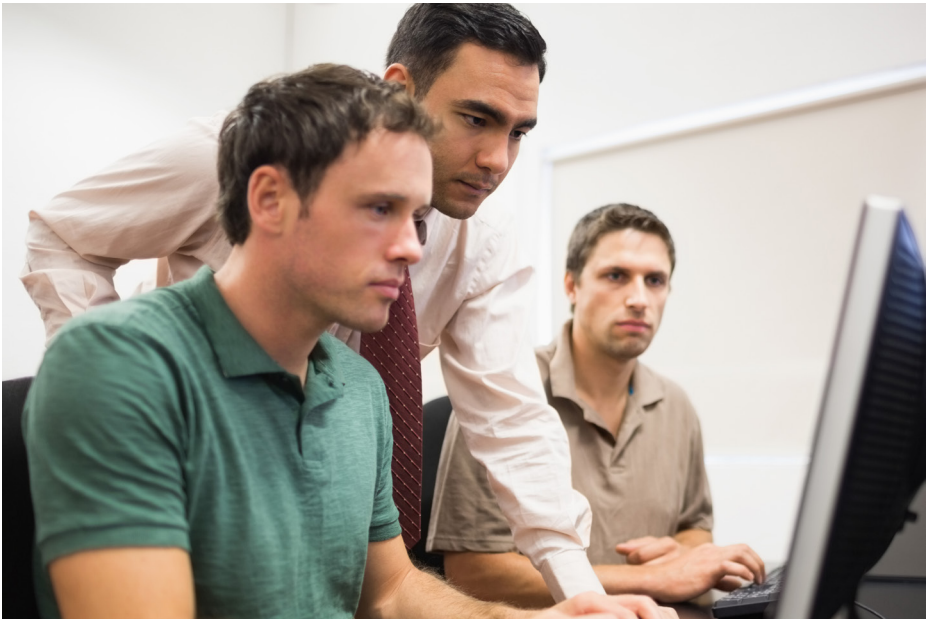
Computer Support Specialist

This program provides students with the skills necessary for a career in the computer support field. Courses will concentrate on current packages for word processing, spreadsheets, database management, Internet access, presentation, and Web publishing. Two different operating systems will also be covered. Classes are conducted in hands-on labs. Upon completion of the program, students will be prepared for MOS, A+, and Net+ certification exams.

Program Requirements **38 credits**

BUS	145	Customer Service	1
IST	102	Introduction to Information Technology (CW 120)	3
IST	103	Presentation Software	1
IST	105	Fundamentals of Word Processing	3
IST	106	Spreadsheet Software	3
IST	107	Database Management	3
IST	108	Microsoft Operating System	3
IST	109	UNIX/Linux Operating System (CW 140)	3
IST	150	PC Tech: Repair and Troubleshooting	3
IST	151	PC Tech: Operating Systems	3
IST	154	Networking Basics	3
IST	204	Help Desk Technology and Services	3
IST	261	Server Management	3
WEB	101	Web Design I	3

Certificate Requirement 38



Certificate

Desktop User Specialist

Students completing this program will have intermediate level skills in word processing, spreadsheet, presentation, database management, and Web publishing software applications. Through completing these courses students will be prepared to take certification exams in these areas. Students will also become proficient in using the Windows operating system and in customer service skills, both areas which will enhance their knowledge base in providing user support within a company or organization.

Program Requirements **18 credits**

BUS	145	Customer Service	1
IST	101	Basic Keyboarding (CW 120)	1
IST	102	Introduction to Information Technology	3
IST	103	Presentation Software	1
IST	105	Fundamentals of Word Processing	3
IST	106	Spreadsheet Software	3
IST	107	Database Management	3
IST	108	Microsoft Operating System	3

Restricted Electives **1-3 credits**

Choose one of the following:

STU	102	Career Planning	(1)
WEB	101	Web Design I	(3)

Certificate Requirement 19

For more information about HCC graduation rates, the median debt of students who completed the program, and other important information, visit www.hagerstowncc.edu/computer-specalist.

WHAT IS NETWORK ADMINISTRATION?

This program of study provides students with the knowledge needed to prepare for entry-level security positions and also serves as a refresher program for those already working in the field who wish to update their skills. This program emphasizes computer security and information assurance concepts augmented with current industry standard techniques. Topics include threats and vulnerabilities, prevention at the technical and human levels (hardware and software), detection, response, and management aspects of security. Upon program completion, students will be prepared for entry-level positions in security or to transfer to a four-year institution to complete a bachelor's degree in information assurance or a related field.

Students earning this associate's degree are prepared to enter these jobs:

- Security specialist
- Information assurance specialist
- Information systems security specialist
- Network security specialist
- Applications security specialist
- Operating system security specialist

WHAT IS THE EMPLOYMENT OUTLOOK?

Employment of network and computer systems administrators is expected to increase by 28 percent from 2010 to 2020, which is much faster than the average for all occupations. Computer networks are an integral part of business, and demand for these workers will increase as firms continue to invest in new technologies. The increasing adoption of mobile technologies will encourage more establishments to use the Internet to conduct business online. Growth will also be driven by the increasing need for information security. As cyber attacks become more sophisticated, demand will increase for workers with security skills (source: *www.bls.gov/ooh*).

For more information about HCC graduation rates, the median debt of students who completed the program, and other important information, visit *www.hagerstowncc.edu/network-admin.*

WHAT ARE THE AVERAGE EARNINGS?

Wages will vary depending on location, level of experience, and education. According to the U.S. Bureau of Labor Statistics, the median annual wage of network and computer systems administrators was $69,160 in May 2010 (source: *www.bls.gov/ooh*).

WHY SHOULD I CHOOSE HCC?

HCC is a proud member of Cyberwatch, a consortium of community colleges, four-year colleges and universities and public and private partners.

HCC has aligned many of its networking technology courses with approved Cyberwatch curriculum. This alignment assures that students receive quality information security education that is recognized throughout the state of Maryland and the Washington, D.C.-metropolitan area.

Graduates of HCC'S program are encouraged to seek post-community college education at an institution designated as a National Center of Academic Excellence in Information Assurance Education (CAEIAE).

HOW DO I GET MORE INFORMATION?

Contact:
Steve Shank
Professor, Information Systems Technology
240-500-2536
spshank@hagerstowncc.edu

Concentration 3:

Network Administration

The career program in network administration is designed for students who plan to enter the field of information technology. Major areas of study include network fundamentals, design, management, troubleshooting, and operating systems. Students who plan to transfer to a four-year program should identify an intended transfer institution as early as possible and complete appropriate courses. Students should always consult with advisors and transferring institutions for specific requirements as these are subject to change.

General Education Requirements **21 credits**

(see page 7)

Program Requirements **35 credits**

IST	102	Introduction to Information Technology	1
IST	108	Microsoft Operating System (CW 130)	3
IST	109	UNIX/Linux Operating System (CW 140)	3
IST	140	Fundamentals of Wireless Computing (CW 245)	3
IST	150	PC Tech: Repair and Troubleshooting	3
IST	151	PC Tech: Operating Systems	3
IST	154	Networking Basics	3
IST	155	Networking I (CW 150)	4
IST	156	Networking II (CW 151)	4
IST	160	Introduction to Security Fundamentals	3
IST	253	TCP/IP	3
IST	261	Server Management I	3

Restricted Electives **3 credits**

Select one course from the following list:

CYB	210	Ethics in the Information Age	(3)
CYB	240	Ethical Hacking Fundamentals	(3)
IST	140	Fundamentals of Wireless Computing	(3)
IST	254	Network Design and Defense	(3)
IST	269	Internship I	(3)

Free Electives **1 credit**

Select another course, minimum of one credit, to complete the 60-credit requirement.

Degree Requirement **60**

Learn about the certificate option on page 16.

Certificate

Network Administration

This program is for the student interested in a career in networking concepts. Major concentration will be network fundamentals, design and management, troubleshooting, and operating systems. Classes are conducted in hands-on labs. Currently, three national certifications are a part of this option: A+®, CISCO®, MSCA (R) (Microsoft Certified Systems Administration) Certification.

Program Requirements **30 credits**

IST	102	Introduction to Information Technology (CW 120)	3
IST	108	Microsoft Operating System	3
IST	150	PC Tech: Repair and Troubleshooting	3
IST	151	PC Tech: Operating Systems	3
IST	154	Networking Basics	3
IST	155	Networking I	4
IST	156	Networking II	4
IST	255	Networking III	4
IST	261	Server Management I (CW 230)	3

Restricted Electives **3 credits**

Electives should be selected in consultation with the Technology and Computer Studies Division to satisfy career goals and/or transfer college requirements. Select elective credits from the following list.

Approved courses are listed below:

IST	109	UNIX/Linux Operating System (CW 140)	(3)
IST	140	Fundamentals of Wireless Computing	(3)
IST	160	Introduction to Security Fundamentals	(3)
IST	166	Computer Forensics I - Principles and Practices	(3)
IST	173	Database Fundamentals	(3)
IST	262	Windows Network Infrastructure	(2)

Certificate Requirement 33

Note: This certificate must be completed within four years because of constantly changing technology. Students who do not complete within four years will fall under the latest college catalog.

HCC is a partner in the Cyberwatch consortium. Cyberwatch provides assistance to its partner institutions for curriculum development and mapping of courses to the National Security Telecommunications and Information Systems Security (NSTISSI) 4011 and 4013 standards. Curriculum development emphasizes building associate degree programs from a set of core technical courses that, in addition to meeting 4011 and/or 4013 standards, help prepare students for several industry certifications including:

- CompTIA's A+, Network+, and Security+
- Cisco Certified Network Associate (CCNA)
- Cisco Certified Entry Networking Technician (CCNT)
- Microsoft Certified Professional (MCP)
- Security Certified Network Professional (SCNP)
- Certified Ethical Hacking (CEH)

For more information, go to *www.cyberwatchcenter.org.*

Centers for Academic Excellence in Information Assurance

HCC was designated as a National Center of Academic Excellence in Information Assurance Two-Year Education (CAE2Y) by The National Security Agency and Department of Homeland Security in 2010. HCC was one of the first six community colleges to receive this distinction in the entire country. The CAE2Y program was established as a means of providing recognition to institutions that serve as models for two-year institutions by providing innovative, comprehensive and multidisciplinary education and training in the Information Assurance/Cybersecurity field. The goal of this program is to reduce vulnerability in the national information infrastructure by promoting higher education and research in information assurance (IA), as well as to produce a growing number of professionals with IA expertise in various disciplines.

Find out more at *www.nsa.gov/ia/academic_outreach/nat_cae/institutions.shtml.*

WHAT IS A COMPUTER SCIENTIST?

Computer scientists design and analyze algorithms to solve problems and develop and study the performance of computer hardware and software.

WHAT IS THE COMPUTER SCIENCE TRANSFER PROGRAM?

Computer science is a transfer program designed to prepare students for careers in software engineering and programming. It includes the study of computers, programming logic and languages, computational systems and mathematics. At HCC, this transfer program provides the first two years of courses needed to transfer to an upper division institution and complete a degree in computer science or computer engineering.

WHAT IS THE EMPLOYMENT OUTLOOK FOR THIS CAREER?

Employment of computer software engineers and developers is expected to increase by 22 percent from 2012 to 2022. This area will see a large number of new jobs due to the demand in networking especially from the Internet, intranet and World Wide Web applications (source: *www.bls.gov/ooh).*

For more information about HCC graduation rates, the median debt of students who completed the program, and other important information, visit *www.hagerstowncc.edu/computer-science.*

WHAT ARE THE AVERAGE EARNINGS?

In 2012, median annual wages were $74,280 for computer programmers and $93,350 for software developers and engineers. Earnings will vary based on education, location, type of job, and experience(source: *www.bls.gov/ooh*).

WHAT ARE THE PROGRAM OPTIONS?

HCC offers an associate of science (A.S.) degree in computer science. It provides the first two years of general education, mathematics, computer programming, and natural science. This serves as the first two years of study toward a baccalaureate degree in computer science or computer science with a minor in mathematics.

WHY SHOULD I CHOOSE HCC?

The curriculum provides graduates with a foundation in programming, algorithm development, mathematics, operating systems, and networks through a set of core courses.

By completing the first two years at HCC and the second two years at a four-year institution such as Shepherd University, students will have learned the fundamental principles and skills needed to become creative problem- solvers, develop and manage state-of-the-art computing systems, and have productive careers in computer science by applying their knowledge professionally in the computer industry, or to pursue graduate studies.

HOW DO I GET MORE INFORMATION?

Contact:
Trudy Gift
Professor, Information Systems Technology
240-500-2214
tgift@hagerstowncc.edu

A.S. Degree

Computer Science

The transfer program in Computer Science is designed for students who plan to transfer to a four-year institution and major in Computer Science, Computer Engineering, or a related field. Students should identify an intended transfer institution as early as possible and complete appropriate courses. Students should always confer with advisors and transferring institutions for specific requirements as these are subject to change.

General Education Requirements **32-33 credits**

Arts/Humanities
Select two courses in different disciplines from approved General Education course list 6

Behavioral/Social Sciences
Select two courses in different disciplines from approved General Education course list 6

Biological/Physical Science
Select two courses from approved General Education course list - one must be a laboratory course 7-8

Diversity
Select one course from approved General Education course list 3

English
ENG 101 English Composition 3
Select another ENG course from approved General Education course list 3

Mathematics
MAT 203 Calculus I 4

Program Requirements **16-17 credits**
CSC 102 Introduction to Information Technology 3
CSC 132 Introduction to C and C++ Programming 3

OR

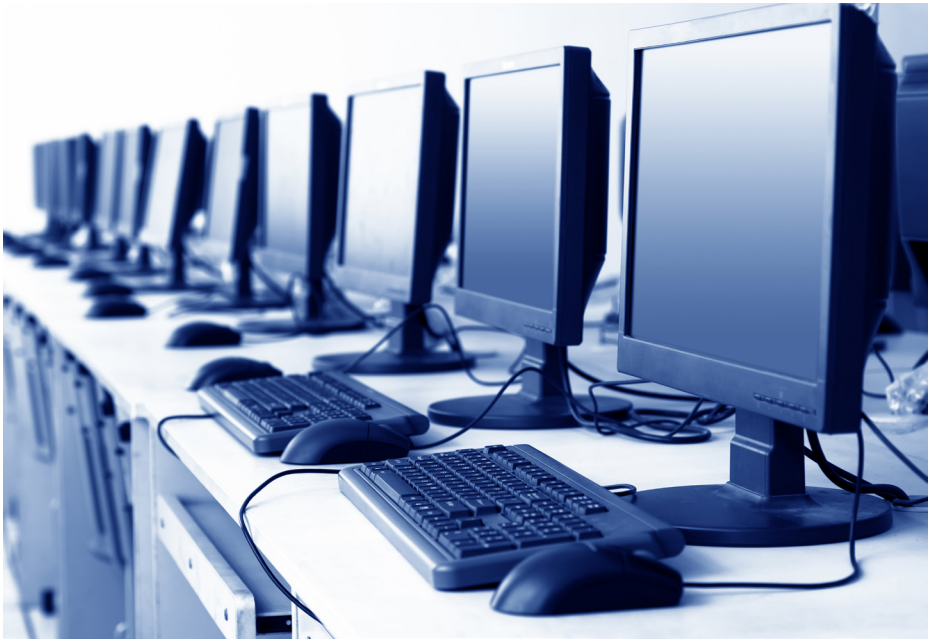
CSC 134 Introduction to JAVA Programming 3

Restricted Electives **10-11 credits**
Select one course from the following list:
CSC 109 UNIX/Linux Operating System ..... (3)
CSC 202 Systems Design and Analysis ..... (3)
CSC 232 Advanced C++ Programming ..... (3)
IST 154 Networking Basics ..... (3)
IST 160 Introduction to Security Fundamentals ..... (3)

Select two courses from the following list:
MAT 204 Calculus II ..... (4)
MAT 206 Differential Equations ..... (4)
MAT 207 Discrete Mathematics ..... (3)
MAT 208 Linear Algebra ..... (4)

Free Electives **10-12 credits**
Electives should be selected in consultation with a transfer advisor and the transfer institution.

Degree Requirement 60



HCC students who have passed nationally recognized certifications may be awarded credit for a related course. To receive credit for a course, the applicant must present an official certificate, license, or transcript indicating the course completed. The certificate, license, or transcript must specify date of completion.

For a full list of available certifications, visit the current college catalog online at *http://catalog.hagerstowncc.edu.*

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