Trade and Industrial Education

Trade and Industrial Education Courses

Advanced Cybersecurity Systems Technology

This Advanced Cybersecurity Systems Technology course provides students with training in procedures for optimizing and troubleshooting concepts for computer systems, subsystems, and networks. Students explore the following:

- Basic network design and connectivity
- Network documentation
- Network limitations and weaknesses
- Network security, standards, and protocols

Students will gain a basic understanding of emerging technologies including unified communications, mobile, cloud, and virtualization technologies. The course prepares students for postsecondary education and training and a successful career in information technology. Upon successful completion of the course, students may qualify to take CompTIA's A+ and Network+ certification exams.

Credits 2
Grades
11, 12
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Forest Park High School
Potomac High School
Prerequisites
Cybersecurity Systems Technology

Automotive Technology 1

In this course, students explore, handle, and perform basic functions in engine repair, automatic transmission and transaxle, manual drive train and axles, suspension and steering systems, and brakes. Students who successfully complete the Automotive Technology program may be eligible to take the Automotive Service Excellence (ASE) Student Certification examination. The ASE Student Certification is the first step in building a career as a service professional in the automotive industry.

Credits 2
Grades
10, 11
Schools
Hylton High School
Osbourn Park High School
Prerequisites
None
Notes
Students prepare for ASE Certification Exams

Automotive Technology 2

In this course, students build upon their basic knowledge of automotive technology, exploring more advanced tasks in engine repair, automatic transmission and transaxle, manual drive train and axles, suspension and steering systems, and brakes. They also learn about electrical, electronic, and HVAC systems in automobiles. Upon successful completion of the course, students may be eligible to take the Automotive Service Excellence (ASE) Student Certification examination.

Credits 2

Grades
11, 12
Schools
Hylton High School
Osbourn Park High School
Prerequisites
Automotive Technology 1
Notes
Students prepare for ASE Certification Exams

Automotive Technology 3

This course prepares students to perform automotive diagnosis and repairs in the following areas: engine repair, cooling systems, transmission and transaxle, manual drive trains and axles, suspension and steering, wheel and tire, brakes, electrical/electronic systems, HVAC, and engine performance. Students are provided with more advanced instruction in all systems as they prepare for the Automotive Service Excellence (ASE) certification examinations. The Automotive Technology program provides the fundamental skills necessary to succeed in an ever-changing and challenging industry as an automotive technician.
Credits 2
Grades
12
Schools
Hylton High School
Osbourn Park High School
Prerequisites
Automotive Technology 2
Notes
Students prepare for ASE Certification Exams

Aviation Maintenance Technology 1

Students will work with airframe and control surfaces, power plants, and basic aviation electricity, and perform ground operations and servicing procedures, as specified by Federal Aviation Administration (FAA) requirements. Students will also practice lab and tool safety, apply science and mathematics principles to aviation maintenance tasks, and research and use maintenance publications, forms, and records.
Credits 2
Grades
10, 11
Schools
Unity Reed High School
Prerequisites
None

Aviation Maintenance Technology 2

Students will explore design features of aircraft through drawings and blueprints. Students will investigate aircraft materials and processes, weight and balance procedures, and fluid lines and fittings. Additionally, students will learn care and maintenance techniques, practice lab and tool safety, and apply academic principles while working with aircraft.
Credits 2
Grades
11, 12
Schools
Unity Reed High School
Prerequisites
Aviation Maintenance Technology 1

Building Trades 1

Building Trades 1 introduces students to skills in the four core areas of residential construction: masonry, carpentry, electricity, and plumbing. Students emphasize safety by earning the Construction Industry Occupational Safety and Health Administration (OSHA) 10 card as they build or repair residential structures, using a variety of materials and tools. Students will also learn current residential building codes associated with the trades.

Credits 1

Grades

10, 11

Schools

Osbourn Park High School

Patriot High School

Prerequisites

None

Building Trades 2

Building Trades 2 teaches students advanced skills in masonry, carpentry, electricity, and plumbing. The class prepares students to synthesize these valuable skills to build or repair residential structures, using a variety of materials and tools. Students will also learn current residential building codes associated with the trades.

Credits 2

Grades

11, 12

Schools

Osbourn Park High School

Patriot High School

Prerequisites

Building Trades 1

Cabinetmaking 1

Students learn workshop and tool safety and employability skills as they practice reading blueprints; estimating and selecting materials; cutting and shaping stock; assembling, fastening, and installing components; and finishing surfaces. The technical, problem-solving, leadership, and creative skills learned in Cabinetmaking can be applied in industries well beyond construction trades and professions and can prepare the student for lifelong learning and success.

Credits 1

Grades

10, 11

Schools

Hylton High School

Prerequisites

None

Cabinetmaking 2

Students continue to learn workshop and tool safety and enhance their employability skills as they interpret plans; estimate and select materials; cut and shape stock; assemble, fasten, and install components; install interior finishes; apply wood veneers and plastic laminates; finish surfaces; and transport and install cabinets. The technical, problem-solving, leadership, and creative skills learned in Cabinetmaking can be applied in industries well beyond construction trades and professions and can prepare the student for lifelong learning and success.

Credits 2

Grades

11, 12

Schools

Hylton High School

Prerequisites
Cabinetmaking 1

Computer Networking Hardware Operations 1

This Computer Networking Hardware Operations 1 course is designed for students who wish to pursue careers in information technology (IT). Students who complete this course will be able to describe the internal components of a computer, assemble a computer system, install operating systems (OS), and troubleshoot these using software tools and diagnostics. The course covers the fundamentals of computer hardware and software and advanced concepts such as security, networking, scripting basics, remote access technology use, Internet of Things (IoT) device configuration, documentation and change-management best practices, disaster prevention and recovery methods, virtualization, and cloud computing. This course helps prepare students for the CompTIA A+ Certification Exam.
Credits 0.5
Grades
10, 11
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Battlefield High School
Prerequisites
None
Semester
I

Computer Networking Hardware Operations 2

The first of the Cisco Networking Academy CCNAv7 courses, this Computer Networking Hardware Operations 2 course will help students develop workplace readiness skills and build a foundation for success in networking-related degree programs and careers. This course covers the architecture, structure, functions, and components of the Internet and other computer networks. With the support of video and rich interactive media, students achieve a basic understanding of how networks operate and how to build simple local area networks (LAN), perform basic configurations for routers and switches, and implement Internet Protocol (IP).

Upon completion of all Cisco Networking Academy CCNAv7 course offerings, learners will be prepared to take the Cisco CCNA Unified certification exam. CCNAv7 teaches comprehensive networking concepts and skills, from network applications to the protocols and services provided to those applications. Learners will progress from basic networking to more complex enterprise and theoretical networking models later in the curriculum.
Credits 0.5
Grades
10, 11
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Battlefield High School
Prerequisites
Computer Networking Hardware Operations 1
Semester
II

Computer Networking Hardware Operations 3

The second of the Cisco Networking Academy CCNAv7 courses, this Computer Networking Hardware Operations 3 curriculum is designed for students who are seeking entry-level jobs in the information technology (IT) industry or who hope to fulfill prerequisites to pursue more specialized IT skills. This course covers the architecture, components,

and operations of routers and switches in small networks and introduces wireless local area networks (WLAN) and security concepts. Students learn how to configure and troubleshoot routers and switches for advanced functionality using security best practices and resolve common issues with protocols in both IPv4 and IPv6 networks.
Credits 0.5
Grades
11, 12
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Battlefield High School
Prerequisites
Computer Networking Hardware Operations 2
Semester
I

Computer Networking Hardware Operations 4

This course introduces students to network design processes using two examples: a large stadium enterprise network and a medium-sized film company network. Students follow a standard design process to expand and upgrade each network, which includes requirements gathering, proof-of-concept, and project management. Lifecycle services, including upgrades, competitive analyses, and system integration, are presented in the context of pre-sale support. In addition to the Packet Tracer and lab exercises found in the previous courses, there are many pen-and-paper and role-playing exercises that students complete while developing their network upgrade proposals.
Credits 0.5
Grades
12
Schools
Battlefield High School
Prerequisites
Computer Networking Hardware Operations 3
Semester
II

Cosmetology 1 (2-year program)

In this introductory course, students study hair, skin, and nails and their related care. Students are grounded in theory as they prepare to practice procedures in a clinical lab setting and classroom, using manikins for manipulative skill practice. The first-year course emphasizes personal safety, professionalism, and sanitation and disinfection of equipment and facilities. Students develop skills in shampooing and conditioning hair, as well as styling and cutting hair. They are introduced to hair coloring and chemical texture services and develop skills in manicure and pedicure procedures.
Credits 3
Grades
10, 11
Schools
Unity Reed High School
Woodbridge High School
Prerequisites
None

Cosmetology 2 (2-year program)

In this continuing course, students build on their theoretical foundation of general sciences and practices in cosmetology to increase proficiency in hair cutting and styling on live models, with attention to professionalism, client consultation, safety, and infection control. Students are trained in safe chemical processes related to permanent

waves, relaxers, lightening, and coloring hair. In addition, students learn to care for skin, hands, and feet, developing experience in providing facials, manicures, pedicures, and nail enhancements. Students will be introduced to a business management unit with a focus on managing the salon.
Credits 3
Grades
11, 12
Schools
Unity Reed High School
Woodbridge High School
Prerequisites
Cosmetology 1 (2-year program)

Criminal Justice 1

Students are introduced to law, public safety, corrections, and security practices. Students examine contemporary issues in the criminal justice system and explore crime scene investigation, criminal investigation, court procedures, policing, and juvenile justice. This course provides a foundation for careers as lawyers, as forensics specialists, and as law enforcement and corrections officers.
Credits 1
Grades
10, 11
Schools
Battlefield High School
Colgan High School
Freedom High School
Gainesville High School
Hylton High School
Potomac High School
Prerequisites
None

Criminal Justice 2

Students apply knowledge learned in Criminal Justice 1 through practical scenarios involving crime scene investigation, criminal investigation, and crisis intervention. Students explore trends in correctional standards and in identifying and preventing terror threats. This course prepares students for careers as lawyers, forensics specialists, and law enforcement and corrections officers.
Credits 2
Grades
12
Schools
Battlefield High School
Colgan High School
Freedom High School
Gainesville High School
Gar-Field High School
Hylton High School
Potomac High School
Prerequisites
Criminal Justice 1
Notes
CTE Sequence: Criminal Justice 1

Cybersecurity Network Systems

This Cybersecurity Network Systems course in an advanced-level course which prepares students for postsecondary education and careers in the rapidly growing field of cybersecurity. Students gain competitive skills required to administer, analyze, and secure applications, networks, and devices. Students perform threat analysis and participate in risk mitigation. Concepts include understanding threats, attacks, and vulnerabilities; exploring technology and tools; examining architecture and design; analyzing identity and access management; demonstrating risk management; and examining cryptography and public key management. Upon successful completion of this course, students may qualify for the CompTIA Security+ certification exam. Individuals with a Security+ credential are well-equipped to further develop their skills toward a CompTIA Cybersecurity Analyst (CSA+) credential.

Credits 1
Grades
11, 12
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Battlefield High School
Prerequisites
Advanced Cybersecurity Systems Technology

Cybersecurity Systems Technology

Students enter the world of computer networking and learn to troubleshoot networks and networking devices, using system tools and diagnostic software. They develop skills in computer networking, resource sharing, and associated security risks. In addition, students explore the relationships between internal and external computer components.

Credits 1
Grades
10, 11
Schools
Forest Park High School
Freedom High School
Patriot High School
Potomac High School

Cybersecurity Systems Technology (DE)

Students enter the world of computer networking and learn to troubleshoot networks and networking devices, using system tools and diagnostic software. They develop skills in computer networking, resource sharing, and associated security risks. In addition, students explore the relationships between internal and external computer components.

Credits 1
Grades
10, 11
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Battlefield High School
Freedom High School

Electricity 1

Electricity 1 students develop fundamental electrical skills to help them prepare for a career in the installation, operation, maintenance, and repair of residential, commercial, and industrial systems. Students will engage in hands-on activities in a lab setting. They will be introduced to residential wiring of houses and apartments; commercial wiring of retailers, schools, businesses, and hospitals; and industrial wiring of factories.

Credits 1
Grades
10, 11
Schools
Unity Reed High School
Prerequisites
None

Electricity 2

Electricity 2 students will continue to develop skills in the installation, operation, maintenance, and repair of residential, commercial, and industrial electrical systems. Students will also study electrical theory and mathematical problems related to electricity; apply requirements of the National Electrical Code (NEC); select and install conductors; examine lighting, communication, and power systems; and work with conduits and raceways, panelboards, switchboards, grounding systems, and generators.
Credits 2
Grades
11, 12
Schools
Unity Reed High School
Prerequisites
Electricity 1

Firefighting 1 & 2

Firefighting requires discipline and attention to academic and professional standards to successfully fight live fires, address hazardous-materials (HAZMAT) incidents, and conduct search-and-rescue operations. Students will become familiar with the procedures, equipment, and technologies used by fire departments. This course challenges students academically, mentally, and physically and meets the standards of National Fire Protection Association (NFPA) 1001-2013 leading to the opportunity to obtain a Firefighter 1 certification.

The Firefighting 2 course builds on the professional knowledge and skills gained in Firefighting 1. Students respond to situations caused by simulated terrorism, accidents, and natural disasters by managing resources such as medevac helicopters, emergency medical personnel, technical rescue teams, and community-based organizations. Students will become familiar with the procedures, equipment, and technologies used by current fire departments. This course challenges students academically, mentally, and physically and meets the standards of National Fire Protection Association (NFPA) leading to the opportunity to obtain Firefighter 2 certification.
Credits 3
Grades
11, 12
Schools
Unity Reed High School
Requirements
Must be at least 16 years old by the first day of the course offering. Must pass a Medical Physical (NFPA 1582) and Physical Agility Test (CPAT)

Plumbing 1

Plumbing 1 students are introduced to the plumbing profession and practice mathematical calculations required for plumbing systems. They learn to safely assemble, install, and repair pipes and fittings, and are introduced to installing fixtures of heating, water, and drainage systems, according to specification and plumbing codes.
Credits 1
Grades
10, 11
Schools
Gar-Field High School

Prerequisites
None

Plumbing 2

Plumbing 2 students practice mathematics skills related to the plumbing profession. They read, interpret, and create drawings of piping systems. Students learn to safely assemble, install, and repair pipes, fittings, and fixtures of heating, water, and drainage systems, according to specification and plumbing codes.
Credits 2
Grades
11, 12
Schools
Gar-Field High School
Prerequisites
Plumbing 1

Television and Media Production 1

In this Television and Media Production 1 course, students will engage in hands-on digital media production while using industry-standard equipment and software. They will learn how to work as media producers and explore careers in the dynamic industry of digital media production.
Credits 1
Grades
9, 10, 11
Schools
Hylton High School
Patriot High School
Prerequisites
None

Television and Media Production 2

This Television and Media Production 2 course builds upon knowledge and skills from Television and Media Production 1. Students will generate fiction and non-fictional media content. Students will enhance their digital media production skills by entering the studio and control room and become proficient with industry-standard equipment and software. They put their knowledge of digital media production into action with use of sophisticated tools and equipment as they begin to develop their personal portfolios.
Credits 2
Grades
10, 11, 12
Schools
Hylton High School
Patriot High School
Prerequisites
Television and Media Production 1

Television and Media Production 3

This Television and Media Production 3 course builds upon knowledge and skills from Television and Media Production 1 and 2. Students will demonstrate mastery of media production knowledge and skills. They will create original productions, assemble a professional digital portfolio, and investigate the dynamic media production industry. Students will research postsecondary opportunities and formulate strategies for both college and career success.

Credits 2

Grades
11, 12
Schools
Hylton High School
Prerequisites
Television and Media Production 2
Notes
Television Production 3 will no longer be offered after the 2024-25 school year.

Welding 1

Welding is required by a wide variety of industries anywhere fusible materials and high heat are needed to manufacture, repair, or alter tools and products. Students in Welding 1 are taught to use manual welding, cutting, and electrical arc welding processes to fabricate and join metal parts according to diagrams, blueprints, and specifications. Students will also learn all safety-related practices and techniques, including earning the Occupational Safety and Health Administration (OSHA) 10 card.
Credits 1
Grades
10, 11
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Potomac High School

Welding 2

This Welding 2 course teaches advanced welding students how to fine-tune their craft and to perform welds in various positions, using multiple welding processes. Welding is required by a wide variety of industries anywhere fusible materials and high heat are needed to manufacture, repair, or alter products. Professional welders are in high demand and can earn accordingly.
Credits 2
Grades
11, 12
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Potomac High School
Prerequisites
Welding 1

Welding 3

This Welding 3 capstone course teaches students the industry's emerging technologies, along with shielded metal arc welding (SMAW) and flux-cored arc welding (FCAW). Students will also learn to operate a computer numerical control (CNC) cutting table. Students are prepared to earn relevant industry credentials toward employment in production or manufacturing facilities.
Credits 2
Grades
12
Course Designation
Dual Enrollment (DE),
Weighted (1.0W)
Schools
Potomac High School

Prerequisites
Welding 2