

FY2026 Information Technology Career Field Pathways and Course Structure

Information Support & Services N0 Pathway Courses	Interactive Media N1 Pathway Courses	Networking N2 Pathway Courses	Programming & Software Development N3 Pathway Courses	Cybersecurity N4 Pathway Courses
145005 Introduction to Information Technology 145010 Web Design 145015 Information Technology Capstone 145020 Computer Mobile Applications 145035 Networking 145050 Network Security 145060 Programming 145065 Object Oriented Programming 145070 Visual Programming 145075 Systems Analysis & Design 145080 Database Administration 145085 Database Applications Development 145110 Video & Sound 145130 Applications of Artificial Intelligence 145135 Fundamentals of Operating Systems 145150 Introduction to Programming Concepts 145160 Personal Computers	145005 Introduction to Information Technology 145010 Web Design 145015 Information Technology Capstone 145020 Computer Mobile Applications 145060 Programming 145065 Object Oriented Programming 145070 Visual Programming 145075 System Analysis & Design 145095 Design Techniques 145100 Creating & Editing Digital Graphics 145105 Multimedia & Image Management 145110 Video & Sound 145115 Animation 145120 3D Techniques 145125 Interactive Application Development 145130 Applications of Artificial Intelligence 145135 Fundamentals of Operating Systems 145140 Hard Surface Modeling 145150 Introduction to Programming Concepts 145155 Organic Modeling 145160 Personal Computers 145165 User-Focused Design Principles 177024 Unmanned Aircraft Systems 3403540 Social Media Communications	145005 Introduction to Information Technology 145010 Web Design 145015 Information Technology Capstone 145020 Computer Mobile Applications 145035 Networking 145045 Network Management 145050 Network Security 145060 Programming 145065 Object Oriented Programming 145070 Visual Programming 145080 Database Administration 145110 Video & Sound 145135 Fundamentals of Operation System 145150 Introduction to Programming Concepts 145160 Personal Computers	145005 Introduction to Information Technology 145010 WebDesign 145015 Information Technology Capstone 145020 Computer Mobile Applications 145060 Programming 145065 Object Oriented Programming 145070 Visual Programming 145075 System Analysis & Design 145090 Game Design 145105 Multimedia & Image Management 145110 Video & Sound 145115 Animation 145120 3D Techniques 145125 Interactive Applications Development 145130 Applications of Artificial Intelligence 145135 Fundamentals of Operating Systems 145140 Hard Surface Modeling 145145 Introduction to GIS 145150 Introduction to Programming Concepts 145155 Organic Modeling 145160 Personal Computers 145165 User-Focused Design Principles 146005 Cybersecurity 177024 Unmanned Aircraft Systems 175002 Engineering Principles 175007 Digital Electronics	145005 Introduction to Information Technology 145015 Information Technology Capstone 145035 Networking 145045 Networking Management 145050 Networking Security 145060 Programming 145135 Fundamentals of Operating Systems 145130 Applications of Artificial Intelligence 145150 Introduction to Programming Concepts 145160 Personal Computers 145165 User-Focused Design Principles 146005 Cybersecurity 146010 Cybersecurity Defense & Reinforcement 146015 Cyber Security Testing & Response

INFORMATION TECHNOLOGY CAREER FIELD COURSE DESCRIPTIONS

VM = COURSE IS AVAILABLE AT THE MIDDLE SCHOOL LEVEL

CTAG = COURSE IS ALIGNED TO A CTAG

INTRODUCTION TO INFORMATION TECHNOLOGY 145005

[N0, N1, N2, N3, N4] VM

The course provides students with a working knowledge of computer concepts and essential skills necessary for work and communication. Students will learn safety, security, and ethical issues in computing and social networking. Students will also learn about input/output systems, computer hardware and operating systems, and productivity applications.

WEB DESIGN 145010 [N0, N1, N2, N3] VM CTAG

Students will learn the dynamics of the Web environment while pursuing an in-depth study of both Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS). Web based protocols such as FTP, TCP/IP, and HTTP will be addressed. Students will create a website with tag text elements, special characters, lines, graphics, hypertext links, and graphical tables.

COMPUTER & MOBILE APPLICATIONS 145020 [N0, N1, N2, N3]

Students will learn to create applications for mobile devices using a variety of commercial and open-source software. They will install these applications, modify them, and develop customer service skills to handle user issues. Knowledge and skills related to customer service in professional situations, small businesses, departments, work groups, and corporate information services will be addressed.

NETWORKING 145035 [N0, N2, N4] CTAG

Students will install, operate, maintain, and troubleshoot a network. Students will learn to manage, configure, and troubleshoot network infrastructure and media. Students will discuss common network topologies and communication protocols.

NETWORK MANAGEMENT 145045 [N2, N4] CTAG

Students will perform network administrator duties by installing and configuring network hardware, software, and peripherals. Abiding by IEEE standards and the Open-Source Interconnection (OSI) model, students will create advanced networks, assign user rights, and develop knowledge and skills of network hierarchy. Students will demonstrate mastery of topologies, remote connectivity, wireless networking and TCP/IP.

NETWORK SECURITY 145050 [N0, N2, N4] CTAG

Students will securely install, configure, and troubleshoot network hardware and peripherals. Students will learn networking by exploring the OSI model, network topologies, and cabling. Students will design simple networks, know how to select physical devices, and be able to configure the equipment to optimize security. Knowledge and skills relating to the operation and usage of network protocols will be developed.

PROGRAMMING 145060 [N0, N1, N2, N3, N4] CTAG

In this course, students will learn the basics of building simple interactive applications. Students will learn the basic units of logic: sequence, selection, and loop. Students will apply algorithmic solutions to problem-domain scenarios. Students will gain experience in using commercial and open-source languages, programs, and applications.

OBJECT-ORIENTED PROGRAMMING 145065 [N0, N1, N2, N3] CTAG

Students will learn to represent programming concepts as "objects" that have data fields and associated procedures known as methods. Students will implement classes such as support static, instance method, inheritance, polymorphism, exception handling, and object serialization. A variety of commercial and open-source programs and applications will be used.

VISUAL PROGRAMMING 145070 [N0, N1, N2, N3]

Students will create event-driven programs using object-oriented programming techniques for use in web-based and standalone applications. Students will map out, design, and test computer applications, web applications, and mobile applications. Both commercial and open-source programs and applications will be used.

SYSTEMS ANALYSIS & DESIGN 145075 [N0, N1, N3]

Students will learn the theory and practice of software testing and develop an understanding of the analysis and design phases of software development. Students will effectively use appropriate programming languages and software patterns to improve software development. A variety of commercial and open-source programs, applications, and tools will be used.

DATABASE ADMINISTRATION 145080 [N0, N2, N3]

Learners apply principles of economics, business management, marketing and employability in an entrepreneur, manager, and employee role to the leadership, planning, developing, and analyzing of business enterprises related to the career field.

DATABASE APPLICATIONS DEVELOPMENT 145085 [N0, N3]

Students will use developer strategies to manipulate data, present database systems theory, and develop database applications. Students will learn to import and export data, manipulate table properties, make advanced queries, and run basic SQL forms and reports. Students will develop macros for automating database tasks and building menu-driven applications. Knowledge and skills of data modeling, diagramming, query writing, and design theory will be developed.

GAME DESIGN 145090 [N1, N3]

This course will prepare students to design and program games using commercial and opensource programs and applications. Students will learn industry standard programming language constructs to write programs that integrate classes, class methods, and class instances. Students will learn input method handling, animation, collision detection, game physics and basic artificial intelligence.

DESIGN TECHNIQUES 145095 [N1] CTAG

Students will learn techniques for transforming photographic images, through use of digital cameras, computers, and mobile devices. To accomplish this, they will learn software photo editing techniques including layering, color correction, masking, and special effects using current commercial and opensource programs and applications.

CREATING & EDITING DIGITAL GRAPHICS 145100 [N1] VM CTAG

Students will learn to design, develop, and produce interactive media projects, web sites, and social media contexts. Students will demonstrate methods of creating professional quality media using commercial and open-source software.

MULTIMEDIA & IMAGE MANAGEMENT TECHNIQUES 145105 [N1, N3] CTAG

Students will apply principles of image creation, management procedures, and multimedia techniques as they create, revise, optimize, and export graphics for video, print, and web publishing. The course will address issues related to web-based publishing, social media, and security. Students will utilize current commercial and open-source languages, programs, and applications.

VIDEO & SOUND 145110 [N0, N1, N2, N3] VM CTAG

Students will create professional video and audio productions for distribution in traditional and new media channels. Students will plan, produce, edit, and launch media products. Students will develop scripts and storyboards, compose shots and operate cameras, capture sounds using microphone hardware, apply special effect techniques, and edit to achieve the final product. Students will be able to use animation and graphic design for video.

ANIMATION 145115 [N1, N3] CTAG

Students will use animation and storyboarding techniques to plan the production of an animation project. Students will design from script and storyboard actions in the pre-production planning process. Students will use commercial and opensource digital animation software to create finished animations, cartoons, and other short movies. They will accomplish this using animated text, character movements, voice, background sound, sound effects, camera movements, and multiple scenes.

3D TECHNIQUES 145120 [N1, N3]

In this course students will learn how to implement 3D assets within interactive media and software. Students will develop programming methods and user controls that are responsive to virtual environments and user input. It is strongly recommended that students have experience with programming and hard surface modeling before taking this course.

INTERACTIVE APPLICATIONS DEVELOPMENT 145125 [N1, N3] CTAG

Students will learn skills to support and create interactive and engaging components for web and standalone interactive applications. Using commercial and opensource programs and applications, students will master web interactivity with advanced techniques.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE 145130 [N0, N1, N3, N4]

This course will prepare students to apply artificial intelligence, machine learning, and neural networks to common workflows, processes, and problems in programming and design. Students will analyze the broader societal, technological, and ethical impacts and implications of its usage and development. Students will learn how to construct prompts and queries and how to critically analyze generated responses.

FUNDAMENTALS OF OPERATING SYSTEMS 145135

[N0, N1, N2, N3, N4] CTAG

Students will perform desktop client administrator duties by providing support for users in various work environments including professional offices, small businesses, work groups, departments, and/or corporate information services (IS). Students will learn to install, configure, and update commercial and open-source operating systems.

HARD-SURFACE MODELING 145140 [N1, N3] CTAG

Students will use current industry standard commercial and open-source programming software to create 3D visual elements in a web or standalone environment. Students will learn how to create static objects using polygonal modeling for applications like environmental design and level building. Students will learn standard techniques for preparing, smoothing, sculpting, and surfacing 3D objects.

INTRODUCTION TO GIS (GEOSPATIAL INFORMATION SYSTEMS) 145145 [N3]

In this course students will be introduced to geospatial information systems and the basic principles of cartography, coordinate systems, and map projections. Students will learn to analyze data for quality and accuracy, assess the quality of data sources, and interface with spatial databases.

INTRODUCTION TO PROGRAMMING CONCEPTS 145150

[N0, N1, N2, N3, N4] VM

Students will learn basic concepts in computer science and programming. Students will learn about logical reasoning, decision trees, troubleshooting, and problem solving. Students will be introduced to numerous programming languages and learn their various uses.

ORGANIC MODELING 145155 [N1, N3]

Students will use current industry standard commercial and opensource programming software to create 3D visual elements in a web or standalone environment. Students will learn basic principles and techniques for modeling naturally occurring objects such as humans, plants, animals, and creatures.

PERSONAL COMPUTERS 145160 [N0 N1, N2, N3, N4] CTAG

Students will learn to install, repair, and troubleshoot computer hardware systems. They will perform preventative maintenance practices and learn techniques for maintaining computer hardware security. Communication skills and professionalism in troubleshooting situations will be emphasized.

USER-FOCUSED DESIGN PRINCIPLES 145165 [N0, N1, N3, N4]

Students will learn the principles of designing user-centric experiences and apply them to issues in programming and design. Students will learn vision mapping, wireframing, and skeuomorphic design. Students will learn to conduct user-focused research, including developing user tasks and personas. Students will learn how human psychology influences consumers interacting with a program or design.

CYBERSECURITY 146005 [N3, N4]

Students will learn the components of cybersecurity and the role each plays in preventing, detecting and mitigating vulnerabilities and attacks. Components include the security of the network infrastructure, security of the systems, and the prevention, detection, and mitigation of common vulnerabilities and attacks. Throughout this course, students will examine and implement security safeguards for desktop, network, and application security.

CYBERSECURITY TESTING & RESPONSE 146015 [N4]

Students will apply the skills of systematic testing and planned response to mitigate security concerns in information technology systems. They will describe the need for security, identify and explain security risks, and implement security safeguards. Students will manage threats, deploy countermeasures, and establish strategies to protect business information using risk and incident management.

UNMANNED AIRCRAFT SYSTEMS 177024 [N0, N1, N3]

Students will learn the essentials of operations an unmanned aircraft in a variety of environments. Students will learn principles of regulations, operations, air space, and navigation. Additionally, students will acquire and use geospatial information for various applications.

SOCIAL MEDIA COMMUNICATIONS 340350 [N1]

In this course, students will learn concepts and principles used in social media communications. Students will learn data-driven marketing and communications strategies and how to apply them to various forms of social media. Students will discuss social, historical, ethical, and economic dimensions of social media.

ENGINEERING PRINCIPLES 175002 [N3] VM

This course will introduce students to fundamental engineering concepts and scientific principles associated with engineering design applications. Topics include mechanisms, energy statics, materials and kinematics. Additionally, students will learn material properties and electrical, control and fluid power systems. Students will learn to apply problem solving, research and design skills to create solutions to engineering challenges.

DIGITAL ELECTRONICS 175007 [N3]

Students are introduced to the process of combinational and sequential logic design. The system uses a precise sequence of discrete voltages, representing numbers, non-numeric symbols or commands for input, processing, transmission, storage or display. Engineering standards and methods for technical documentation will also be learned.