



Regional pathway models support the alignment of stakeholders, including employers, higher education, K-12, and workforce, to ensure pathways prepare young people for careers with family-supporting wages and build a robust talent pipeline for employers. Pathway models demonstrate a vision from middle school to career, including high school coursework, career-connected learning activities, potential postsecondary programs, and in-demand jobs in the regional labor market. This is a living document that will be updated regularly to reflect current education programs and workforce needs.

## Selected Postsecondary Options

These selected postsecondary credentials in IT/computer science are based on program options and transfer agreements at Sinclair College. Some education paths have credentials that easily stack or build from the previous credential, while others are not as easily stackable. Stackable credentials can help an individual progress in their career pathway or move up a career ladder to different or higher-paying jobs. Within the fields of IT and computer science, a particular education credential can prepare students for a variety of occupations. Alternate job titles for the occupational outcomes listed below are featured in the Selected Wages, Occupations, and Job Growth table.

|                                                        |  Initial Credential |  Stackable Credentials                                                                    |  Potential Occupational Outcome                                                                                                                   |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Computer Information Technology                        | CompTIA A+<br>CompTIA IT Fundamentals+                                                               | Computer Information Systems-User Support Associate of Applied Science<br><br>(Students eligible to take the following certification exams: A+, Network+, Security+)       | Computer Information Systems Bachelor of Science<br><br>Computer Network Support Specialist, Computer User Support Specialist                                                                                                        |
|                                                        | CompTIA IT Fundamentals+<br>CompTIA A+<br>CCENT Network+<br>AZ-900                                   | Computer Information Systems- Network Engineering, Associate of Applied Science<br><br>(Students eligible to take the following certification exams: CCNA, Security+, A+*) | Computer Information Systems Bachelor of Science<br><br>Network and Computer Systems Administrator, Information Security Analyst, Computer Network Architect                                                                         |
|                                                        | CompTIA IT Fundamentals+<br>CompTIA A+<br>OCAJ                                                       | Computer Information Systems- Software Development Associate of Applied Science<br><br>(Students eligible to take the Network+ certification exam)                         | Computer Information Systems Bachelor of Science<br><br>Software Developer, Network and Computer Systems Administrator, Computer User Support Specialist, Information Security Analyst                                               |
| Computer Science                                       | CompTIA IT Fundamentals+<br>CompTIA A+<br>CompTIA Security+                                          | Computer Science Associate of Science                                                                                                                                      | Computer Science Bachelor of Science<br><br>Software Quality Assurance Analysts and Testers, Computer Systems Analysts, Computer and Information Systems Managers                                                                    |
| Cybersecurity: Prevention and Investigation Technology | CompTIA IT Fundamentals+<br>CompTIA A+                                                               | Associate of Applied Science in Health Information Management                                                                                                              | IT and Cybersecurity Bachelor of Science<br><br>Cybersecurity Analyst/Technician, Cyber Crime Analyst/Investigator, Incident Analyst/Responder, IT Auditor, Computer Network Architects, Network and Computer Systems Administrators |
|                                                        | CompTIA IT Fundamentals+                                                                             | Cyber Investigation Technology Associate of Applied Science<br><br>(Students eligible to take the following certification exams: A+, Network+, Linux+,                     | Intelligence Analyst, IT Specialist, Network and Computer Systems Administrator, Information System Security Manager, Cyber Security Incident Response Specialist, Private Investigator, Information Security Analyst                |
| Guided Transfer                                        | CompTIA IT Fundamentals+<br>CompTIA A+<br>CompTIA Security+                                          | Computer Science Associate of Science                                                                                                                                      | Computer Science Bachelor of Science<br><br>Software Developer, Software Engineer, Data Engineer                                                                                                                                     |

\*This credential is connected to an optional elective course; therefore, students need to take that specific elective to take the certification exam.

## Postsecondary Preparation

These activities support students in preparing for careers and serve as the foundation for students' exploration, decision-making, and preparation for IT and computer science careers. Work-based learning (marked with an asterisk: \*) enables students to apply their academic learning in a real workplace setting. Advising supports students in making decisions that align best with their strengths and future goals. Employability skills are developed and strengthened across grade levels to prepare students with the key durable skills to succeed in education, training, and the workplace.



|                                | Grade 6                                                                                                                                                                                                                                                                                                 | Grade 7                                                                                                                                                                                                                                                              | Grade 8                                                                                                                                                                                                                                                                                                                                                     | Grade 9                                                                                                                                                                                                                                                | Grade 10                                                                                                                                                                                                            | Grade 11                                                                                                                                                                                                                                                                                                                                                                                                                                           | Grade 12                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Career-Connected Learning      | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Industry Speaker</li> <li>• Career Interest Inventories</li> <li>• Classroom Career Challenges</li> <li>• Intro to Career Clusters</li> </ul>                                                                                       | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Industry Project</li> <li>• Power Lunch</li> <li>• Career Fair</li> <li>• Career Research Mini-Projects</li> <li>• Skills &amp; Strengths Reflection</li> <li>• Intro to Goal Setting</li> </ul> | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Worksite Tour</li> <li>• Informational Interview</li> <li>• Career Adventures</li> <li>• Career and Technology Center (CTC) Visits</li> <li>• Middle School Career Presentation or Portfolio</li> <li>• Basic Workplace Etiquette</li> <li>• High School Pathway Exploration</li> </ul> | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Job Shadow</li> <li>• Service Learning</li> <li>• CTC Visits</li> <li>• Career Cluster Deep Dives</li> <li>• Intro to Professional Networking</li> <li>• Resume Writing</li> </ul> | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Mock Interview</li> <li>• School-Based Enterprise*</li> <li>• Career Mentorship (short-term)</li> <li>• Career Portfolio Development</li> </ul> | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Internship*</li> <li>• Clinical Experience*</li> <li>• College Visits</li> <li>• Advanced Resume Writing &amp; Cover Letter Development</li> <li>• Workplace Communication Workshops</li> <li>• Postsecondary Options Workshops</li> <li>• Financial Literacy Course</li> <li>• College Application Prep Work</li> <li>• Industry-Recognized Credential Examination</li> </ul> | <b>Career Exploration:</b> <ul style="list-style-type: none"> <li>• Practicum*</li> <li>• Youth Apprenticeship*</li> <li>• Capstone Project (career or pathway aligned)</li> <li>• Final Resume &amp; Professional Portfolio</li> <li>• Free Application for Federal Student Aid (FAFSA)</li> <li>• Complete Ohio Means Jobs Readiness Seal</li> <li>• College and Career Signing Day</li> </ul> |
| Career Navigation and Advising |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• YouScience</li> <li>• Student Success Plan</li> </ul>                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>• Confirmation of Pathway</li> <li>• Four-Year High School Plan Review</li> </ul>                                                                                                                               | <ul style="list-style-type: none"> <li>• YouScience</li> <li>• Revisit Student Success Plan</li> </ul>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Senior Exit Interview</li> <li>• Transition Planning</li> </ul>                                                                                                                                                                                                                                                                                         |
| Employability Skills           | Reliability - Work Ethic - Punctuality - Discipline - Teamwork and Collaboration - Professionalism - Learning Agility - Critical Thinking/Problem Solving - Leadership - Creativity/Innovation - Oral and Written Communication - Digital Technology - Global/Intercultural Fluency - Career Management |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                  |



# Montgomery County Information Technology(IT)/Computer Science Pathway

## IT/Computer Science Technical Competencies

Competencies describe the technical skills that students need for a successful career in IT and computer science. Technical competencies should be embedded in both academic coursework and work-based learning experiences.

### User and Customer Support

Use understanding of the range of technical support processes, user needs, and customer service approaches to diagnose issues, help users solve problems, and implement solutions related to IT.

### Principles of IT Systems and Concepts

Use understanding of fundamental IT concepts, systems, platforms, and tools to explain system functions, identify common issues, and support effective use of technology.

### Principles of Data Management and Use

Use understanding of data collection, organization, storage, governance, and responsible use, combined with analysis and evaluation, to manage data and support informed decision-making.

### Logic and Fundamentals of Computer Languages

Use understanding of how computer languages communicate combined with computational thinking to develop and refine simple mobile and web applications.

### Responsible and Effective Use of Artificial Intelligence (AI)

Use understanding of how generative and agentic AI systems produce outputs combined with prompt design, critical thinking, and verification strategies to create, improve, and validate work products.

### Principles of Software

Use understanding of software design, source code, AI-assisted development, testing, debugging, and maintenance to design, test, modify, and improve simple software applications.

### Security, Compliance, and Risk Management

Use understanding of cybersecurity threats, protective controls, risk management, and legal or regulatory requirements to identify basic threats, apply secure practices, and ensure procedures are in place for compliance.

### Routing and Network Configurations

Use understanding of common networking protocols, routing, and configurations to maintain basic networks and resolve common connectivity issues.

### Servers and Storage

Use understanding of servers, storage systems, and backup processes to manage and protect data and restore information.

### Fundamentals of Cloud Computing and Virtualization

Use understanding of the features, benefits, and concepts of virtualization and cloud computing to evaluate cloud solutions and support cloud-based resources.

## Academic Coursework

This general coursework is recommended for all students in the IT/computer science pathway. The career-focused courses include College Credit Plus (CCP) courses that apply to a broad range of postsecondary IT/computer science programs and save students time and money in pursuing a postsecondary degree by earning credit that applies to both high school and college.



|                        | Grade 8                   | Grades 9 and 10                                                                                                                                                                                                                    | Grade 11                                                                                                                                | Grade 12                                                                                                              |
|------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Career Focused Courses | IT Networking Programming | Foundational IT/Comp Sci or CCP Course such as:<br>+ ALH 1101-Introduction to Health Care Delivery<br>CIS 1107-Introduction to Operating Systems<br>+ BIS 1105-IT Fundamentals<br>+ BIS 1120-Introduction to Software Applications | Strategic CCP Course such as:<br>+ CIS 1130-Network Fundamentals<br>+ CIS 1111-Introduction to Problem Solving and Computer Programming | Strategic CCP Course such as:<br>+ CIS 1140-Information Systems Analysis and Design<br>+ CIS 2165-Database Management |
| English                | Grade 8 English           | English I, English II                                                                                                                                                                                                              | English III                                                                                                                             | English IV<br>+ or ENG 1101-English Composition I                                                                     |
| Math                   | Algebra I                 | Geometry<br>+ or MAT 1470-College Algebra                                                                                                                                                                                          | Algebra II                                                                                                                              | Trigonometry/Calculus                                                                                                 |
| History                | Social Studies            | World History                                                                                                                                                                                                                      | US History                                                                                                                              | U.S. Government<br>+ PLS 1121-U.S. Federal Government and Civics                                                      |
| Science                | Physical Science          | Biology                                                                                                                                                                                                                            | Chemistry                                                                                                                               | Physics                                                                                                               |

+ Indicates CCP course

**Note:** Students who complete the following six career-focused courses, all listed in the table above, can earn the IT Fundamentals Certificate at Sinclair College: BIS 1105 or BIS 1120, CIS 1107, CIS 1111, CIS 1130, CIS 1140, and CIS 2165.

## Selected Occupations, Wages, and Job Growth

The table below includes labor market information about selected IT and computer science careers, including median wages and typical education level required. The living wage (\$38.68 hour) is derived from the MIT Living Wage Calculator and is intended to be a sufficient wage for one adult and one child living in Montgomery County, OH in 2026. A majority of the occupations included have median hourly earnings above a living wage, but some jobs have a large pay range; this means that employees who have less experience, credentials, and skills can be paid significantly less than the median wage, which can be seen in the “Entry-Level Wages” column in the table. The last column shows national data on how many workers in these positions have a bachelor’s degree or higher, indicating that for some positions, a four-year degree is an important credential.

| Typical Job                                     | Alternate Job Titles                                                                  | Pays Living Wage (\$38.68) | Median Hourly Earnings | Entry- Level Wages | Positions (2025) | Expected Growth # (2025-2030) | Expected Growth % (2025-2030) | Typical Work Experience Required | Workers with a Bachelor’s or Higher* |
|-------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------|------------------------|--------------------|------------------|-------------------------------|-------------------------------|----------------------------------|--------------------------------------|
| Computer Network Support Specialists            | Desktop/Network Support Specialist, Network Support Technician, IT Support Specialist | No                         | \$30.76                | \$21.31            | 496              | 13                            | 3%                            | None                             | 49%                                  |
| Computer User Support Specialists               | Desktop Support Technician, Help Desk Analyst                                         | No                         | \$24.87                | \$18.06            | 2,093            | 50                            | 2%                            | None                             | 49%                                  |
| Network and Computer Systems Administrators     | Network Administrator, Systems Administrator, Cloud Administrator                     | Yes                        | \$45.16                | \$29.64            | 1,230            | -31                           | -3%                           | None                             | 53%                                  |
| Information Security Analysts                   | Information Security Officer, Network Security Analyst                                | Yes                        | \$51.92                | \$31.78            | 530              | 71                            | 13%                           | <5 Years                         | 71%                                  |
| Computer Network Architects                     | Network Analyst, Network and Security Engineer                                        | Yes                        | \$61.93                | \$35.00            | 420              | 29                            | 7%                            | 5+ Years                         | 54%                                  |
| Software Developers                             | Application Developers, Systems Engineer                                              | Yes                        | \$50.05                | \$35.81            | 3,823            | 382                           | 10%                           | None                             | 86%                                  |
| Software Quality Assurance Analysts and Testers | Quality Assurance (QA) Engineer, QA Analyst, Software Tester                          | Yes                        | \$39.19                | \$26.40            | 340              | 30                            | 9%                            | None                             | 73%                                  |
| Computer Systems Analysts                       | IT Analyst                                                                            | Yes                        | \$48.20                | \$28.69            | 1,274            | 70                            | 5%                            | None                             | 72%                                  |
| Computer and Information Systems Managers       | Application Development Director, IT Director                                         | Yes                        | \$73.03                | \$46.97            | 904              | 99                            | 11%                           | 5+ Years                         | 74%                                  |

\*2022-2023 National Bureau of Labor Statistics data.