

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Safety

Number: 100 **Hours:** 43.00

Dates: Spring 2025

Description/Objectives:

This unit introduces students to safety principles and protocols in information technology environments. Emphasis is placed on personal, organizational, and information security, occupational safety, and safe practices in the use of information systems.

Tasks:

PA101 - Follow ergonomic best practices for health, safety, and productivity.

PA102 - Organize and maintain workspace.

PA103 - Dissipate electrostatic discharge and identify related risks.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- College and Career Readiness Anchor Standards

Supporting Anchor/Standards:

CCR.SL.6-12.6 Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

CCR.SL.6-12.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Instructional Activities:

- Explore for Essential Question
- Go Find
- Picture questioning
- Demonstrate what was learned
- Essential Question Reflection
- What are three things that you learned?

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Study Guide

- Directions and/or Tests Read Aloud
- Adapted Tests and/or Assignments
- No Penalization for Spelling
- Positive Reinforcement
- Wait Time

Safety:

observe proper Egonomic Practice

Assessment:

- FORMATIVE/SUMMATIVE EVALUATION
- Traditional Tests - multiple choice, matching, true/false, short answer completion
- Graded Writing assignments

Resources/Equipment:

Instructor provided articles

PowerPoint

Hyperlinks:

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Professional Business Procedures

Number: 200 **Hours:** 106.00

Dates: Spring 2025

Description/Objectives:

This unit provides students with the knowledge and skills required to function professionally and efficiently in a business environment. Emphasis is placed on professional conduct, effective business communication, time management, organizational procedures, business etiquette, and the integration of business technologies to support management information systems.

Tasks:

PA201 - Practice and deliver multimedia and telecommunications etiquette.

PA202 - Identify, proofread, and correct grammar errors in all documents.

PA203 - Practice professional interpersonal communication skills.

PA204 - Use time management skills.

PA205 - Prepare business correspondence and technical documents.

PA207 - Identify needs and build rapport with end users.

PA208 - Develop and perform conflict resolution practices.

PA212 - Apply supervision and training techniques.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Career Education and Work Academic Standards
13.3. Career Retention and Advancement

Supporting Anchor/Standards:

13.3.11 A. Evaluate personal attitudes and work habits that support career retention and advancement.

13.3.11 B. Evaluate team member roles to describe and illustrate active listening techniques:
Clarifying Encouraging Reflecting Restating Summarizing

13.3.11 C. Evaluate conflict resolution skills as they relate to the workplace: Constructive criticism
Group dynamics Managing/leadership Mediation Negotiation Problem solving

Instructional Activities:

- *Pre-Learning
- Directed reading or learning questions
- Read, listen, share, and question in a small group
- Demonstrate what was learned
- Essential Question Reflection

- Process listing
- What are three things that you learned?

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Directions/Comprehension Check (frequent checks for understanding)
- Study Guide
- Adapted Tests and/or Assignments
- Taking Tests in Alternate Setting (or if requested)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Positive Reinforcement
- Wait Time
- Daily Classwork Check
- Encourage Student to Check Work Before Turning In

Safety:

Observe proper Ergonomic practices.

Assessment:

- FORMATIVE/SUMMATIVE EVALUATION
- Traditional Tests - multiple choice, matching, true/false, short answer completion
- Graded Homework
- Graded Writing assignments
- Graded Reading assignments
- Class Oral Responses
- WORK ETHIC

Resources/Equipment:

All materials for this unit will be provided by Instructor.
Hyperlinks: www.careersafeonline.com

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Business Law and Ethics

Number: 300 **Hours:** 108.00

Dates: Spring 2025

Description/Objectives:

This unit provides an overview of the legal and ethical principles that govern business operations, with a focus on issues relevant to information systems and technology management. Topics include contract law, intellectual property, employment law, regulatory compliance, cybersecurity law, privacy, and ethical decision-making in a business context. Students will analyze real-world scenarios and apply legal reasoning and ethical frameworks to address complex business challenges in the digital age.

Tasks:

PA301 - Identify and explain the principles of business law and ethics (e.g., intellectual property).

PA303 - Explain crimes often associated with businesses and organizations (e.g., embezzlement, extortion, and computer crimes).

PA305 - Identify proper use of business technology and property (e.g., computers, mobile devices, cyber safety awareness and telephones).

PA306 - Identify legal safeguards to protect sensitive data and preserve confidentiality.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

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CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

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INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

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understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

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RESEARCH GRADES 9-10-11-12

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Connecting Anchor/Standard:

- College and Career Readiness Anchor Standards

Supporting Anchor/Standards:

CCR.SL.6-12.6 Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

CCR.SL.6-12.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Instructional Activities:

Instructor-led sessions introducing legal concepts, ethical frameworks, and case law.

Use of multimedia presentations to explain legal terminology and ethical theories.

In-depth analysis of real or hypothetical legal and ethical cases in business and IT contexts.

Group discussion and written reports on legal rulings and ethical outcomes.

Structured debates on controversial topics such as data privacy, whistleblowing, or copyright infringement.

Students work in teams to evaluate and resolve ethical dilemmas using decision-making models.

Scenarios drawn from IT environments (e.g., insider threats, software licensing issues, employee monitoring).

Collaborative projects analyzing the impact of legal/ethical considerations on business decisions.

Presentation of findings and policy recommendations.

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Study Guide
- Adapted Tests and/or Assignments
- Taking Tests in Alternate Setting (or if requested)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Small Group Instruction
- Positive Reinforcement
- Wait Time
- Grading Rubric
- Daily Classwork Check
- All Vocabulary to be Defined Before Testing

Safety:

Observe proper Ergonomic Practices.

Assessment:

Assessments to measure understanding of legal terminology, ethical theories, and applied knowledge. Combination of multiple choice, short answer, and case-based essay questions.

Resources/Equipment:

All materials needed for this unit will be provided by Instructor.

Hyperlinks:

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Computer and Internet Fundamentals

Number: 400 **Hours:** 108.00

Dates: Spring 2025

Description/Objectives:

This unit provides an introduction to the fundamental concepts and practical skills related to computer systems, internet technologies, and digital communication tools used in modern business environments. Students will explore computer hardware and software components, operating systems, basic troubleshooting, internet navigation, cloud services, cybersecurity awareness, and the use of common productivity applications. Emphasis is placed on the role of computing in supporting business processes and the responsible use of information technology.

Tasks:

PA401 - Use terminology associated with online technologies.

PA402 - Stay current with new and emerging technologies and certifications.

PA403 - Use advanced search engine techniques to locate resources.

PA404 - Identify components of a computer system and related peripherals.

PA405 - Navigate and manage operating systems and utility programs (e.g., installing, uninstalling, updating software).

PA406 - Identify types of telecommunication devices and networks (e.g., local area network (LAN), wide area network (WAN), router, switch, firewall).

PA407 - Identify file types and use file management techniques (e.g., compressing files, copying files, renaming files).

PA408 - Use a variety of cloud computing services.

PA410 - Utilize multimedia presentation software for professional communication.

PA411 - Design, edit, and publish documents using appropriate software.

PA412 - Identify and explain the variety of E-commerce models, e.g., business-to-business (B2B), consumer-to-business (C2B), business-to-consumer (B2C), customer-to-customer (C2C).

PA413 - Select data and design mail merge functionality in productivity software.

PA414 - Construct files utilizing features, such as formats, headers and footers, styles, tables, and charts.

PA415 - Differentiate between the types of programming language, e.g., procedural, object-oriented, script.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

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CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

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Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

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RESEARCH GRADES 9-10-11-12

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RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Pennsylvania Common Core Standards Mathematics

Supporting Anchor/Standards:

CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents.

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.3 Apply quantitative reasoning to choose and Interpret units and scales in formulas, graphs and data displays.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

Instructional Activities:

Perform hardware identification and configuration tasks (e.g., assembling components, using peripheral devices).

Practice file management (creating, organizing, copying, and backing up files/folders).

Conduct operating system navigation (e.g., Windows, macOS, or Linux basics).

Use productivity software such as:

Word processors for business correspondence.

Spreadsheets for basic data entry, formatting, and functions.

Presentation software to create and deliver slideshows.

Complete guided projects that simulate workplace tasks using Microsoft Office, Google Workspace, or similar tools.

Perform advanced web searches using Boolean operators and filters.

Evaluate website credibility and identify signs of misinformation or scams.

Explore and use cloud-based tools and services (e.g., Google Drive, Dropbox, Office 365).

Identify phishing attempts and online fraud scenarios.

Complete cybersecurity modules (e.g., password safety, social engineering).

Participate in simulations using online platforms focused on cyber hygiene.

Class discussions on responsible use of technology, privacy rights, and digital ethics.

Explore legal and ethical issues related to internet use (e.g., plagiarism, copyright).

View instructional videos on key computing concepts (e.g., how the internet works, hardware overview).

Reflect and respond to video content through guided questions or discussion posts.

Complete small group projects such as:

Designing a simple business newsletter or flyer.

Creating a shared spreadsheet for budgeting.

Collaborating in a cloud environment to simulate remote teamwork.

Diagnose and resolve basic computer or internet connectivity issues.

Walkthrough scenarios involving user support or system error messages.

Live walkthroughs of software functions, computer settings, and internet tools.

Screen-sharing or recorded demos for asynchronous or hybrid formats.

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Study Guide
- Adapted Tests and/or Assignments
- Taking Tests in Alternate Setting (or if requested)
- No Penalization for Spelling
- Small Group Instruction

- Positive Reinforcement
- Access to School Counselor
- Grading Rubric
- Daily Classwork Check
- All Vocabulary to be Defined Before Testing

Safety:

Observe proper Ergonomic practices.

Assessment:

Weekly assessments on computing terms and concepts.

Use flashcards or interactive online quizzes to reinforce learning.

Combine learned skills to complete a simulated workplace task (e.g., prepare a report, format and analyze data in a spreadsheet, create a slide presentation).

Present project findings to the class or submit for instructor review.

Resources/Equipment:

Interactive platforms such as Kahoot, Quizizz, or GCFGlobal for self-paced learning.

Access to computer labs or virtual lab environments.

Hyperlinks:

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Data Analysis Software

Number: 500 **Hours:** 130.00

Dates: Spring 2025

Description/Objectives:

This unit introduces students to the use of industry-standard software tools for data analysis in business and management information systems. Students will gain hands-on experience with spreadsheet applications, statistical software, and data visualization platforms used to collect, organize, analyze, and present business data. Emphasis is placed on interpreting data to support business decisions, creating dashboards, performing basic statistical analysis, and applying data-driven insights in organizational contexts.

Tasks:

PA501 - Manage, manipulate, and validate data using spreadsheets.

PA502 - Generate and analyze graphs/charts and associated data using spreadsheet software.

PA504 - Input data (e.g., payroll or inventory data, into spreadsheet software).

PA505 - Create, show formulas, and use built-in functions utilizing spreadsheet software.

PA506 - Sort and filter spreadsheet data.

PA507 - Format spreadsheet cells (e.g., underline, alignment, borders, shading).

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

Standard CC.3.5.9-10.E / Standard CC.3.5.11-12.E Analyze the structure of the relationships among concepts in a text, etc.

Standard CC.3.5.9-10.F / Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.

INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

Standard CC.3.5.9-10. H Assess the reasoning in a text to support the author's claim for solving a technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

Standard CC.3.6.9-10.A Standard CC.3.6.11-12.A Write arguments focused on discipline specific content.

Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Standard CC.3.6.9-10.E Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.

RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- Pennsylvania Common Core Standards Mathematics

Supporting Anchor/Standards:

CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context.

CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems.

Instructional Activities:

Guided exercises using spreadsheet software (e.g., Microsoft Excel, Google Sheets) to perform:

Data entry and formatting

Functions and formulas (e.g., VLOOKUP, IF statements, financial calculations)

Pivot tables and data sorting/filtering

Labs using data visualization tools (e.g., Tableau, Power BI) to:

Create charts, dashboards, and interactive visuals
 Import and connect to various data sources
 Apply filters, slicers, and calculated fields.

Complete real-world scenarios using large data sets to:

Perform descriptive and inferential analysis
 Generate performance metrics (KPIs) and dashboards
 Present business insights through structured reports and visuals
 Develop an end-of-unit capstone project (e.g., business report)

Practice identifying and correcting data quality issues:

Missing values, duplicates, incorrect formats
 Use of Excel functions
 Simulate data validation processes used in business analytics workflows

Collaborative Group Work

Teams analyze shared data sets and co-develop reports or dashboards
 Peer review and critique of group work to reinforce best practices.

Assignments based on external tutorials (e.g., Microsoft Learn, Tableau Training, LinkedIn Learning)
 Guided reflection or discussion posts to reinforce content

In-class discussions around:

Responsible data handling and privacy
 Ethical implications of business data use and bias in analysis
 The importance of transparency and integrity in presenting findings

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Study Guide
- Adapted Tests and/or Assignments
- Taking Tests in Alternate Setting (or if requested)
- No Penalization for Spelling
- Copy of Teacher/Student Notes/Skeleton Notes
- Positive Reinforcement
- Access to School Counselor
- Wait Time
- Grading Rubric

Safety:

Observe proper Ergonomic practices.

Assessment:

Assess understanding of key software features, terminology, and functions

Practical “skills check” quizzes where students must complete tasks within the software environment

Traditional Tests - multiple choice, matching, true/false, short answer completion

FORMATIVE/SUMMATIVE EVALUATION

Resources/Equipment:

Microsoft Excel

Tableau Public or Tableau Desktop

Google Sheets

Hyperlinks:

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Database Administration

Number: 600 **Hours:** 151.00

Dates: Spring 2025

Description/Objectives:

This unit introduces students to the principles, tools, and best practices of database administration within business and enterprise environments. Emphasis is placed on the installation, configuration, security, backup and recovery, performance tuning, and ongoing maintenance of relational database management systems (RDBMS). Students will develop practical skills in managing users, roles, storage structures, and data integrity, as well as applying administrative functions through structured query language (SQL) and graphical interfaces.

Tasks:

PA601 - Design a database structure and use related terminology.

PA602 - Create an entity-relationship diagram.

PA603 - Create tables and modify fields.

PA604 - Build forms to capture, manipulate, and display data.

PA605 - Construct and manage queries using one or more tables.

PA606 - Design and arrange reports using filters.

PA607 - Apply normalization to relational databases.

PA609 - Implement security, back-up, and recovery procedures.

PA610 - Import and export data into other applications.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

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technical problem.

Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

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Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

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RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

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RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.

3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.

3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:

Hands-On Lab Exercises:

Install, configure, and manage a relational database system (e.g. SQL Server).

Create, modify, and delete databases, tables, indexes, views, and stored procedures using SQL.

Configure user accounts, roles, and permissions for access control.

Perform database backups and test restoration processes.

Set up and manage tablespaces, file storage, and schema objects.

Monitor and optimize system performance using built-in tools or command-line utilities.

Simulated real-world scenarios requiring:

Troubleshooting database connection failures

Diagnosing slow query performance

Executing emergency recovery from corrupted data files

Design and implement a comprehensive database environment for a mock business organization.

Document configuration settings, backup strategies, user roles, and performance tuning techniques.

Submit administrative scripts and reports as deliverables.

Write and execute SQL scripts for database maintenance tasks (e.g., batch user creation, log rotation).

Schedule recurring jobs using database schedulers or OS-level cron jobs/task schedulers.

Analyze query execution plans to identify inefficiencies.

Monitor database activity using logs and performance dashboards.

Enable and review audit trails to monitor user activity.

Conduct a security assessment of a database environment.

In teams, manage a shared virtual database server environment.

Assign roles (e.g., DBA, security analyst, backup admin) to simulate team-based administration.

Submit group performance reports and conduct peer evaluations.

Live or recorded demonstrations of complex administrative tasks, such as configuring high-availability clusters or migrating databases between servers.

Walkthroughs of GUI-based and command-line database management tools.

Capstone Project

Develop a fully documented and secured database system to support a simulated business application.

Include administrative, security, backup, and tuning elements.

Present the system and justify design/administration decisions to peers or faculty.

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Study Guide
- Adapted Tests and/or Assignments
- Taking Tests in Alternate Setting (or if requested)
- Small Group Instruction

- Positive Reinforcement
- Wait Time
- Access to School Counselor
- Grading Rubric

Safety:

Observe proper Ergonomic Practices.

Assessment:

Weekly or unit-based quizzes on terminology, concepts, and best practices.

Hands-on practical exams requiring students to complete administrative tasks in a timed environment.

Resources/Equipment:

Database Platforms: Microsoft SQL Server

Administrative Interfaces: SQL Server Management Studio (SSMS)

Scripting Languages: SQL

Virtual Environments: VMware, VirtualBox, or cloud-based sandboxes

Hyperlinks:

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Programming and System Development

Number: 700 **Hours:** 302.00

Dates: Spring 2025

Description/Objectives:

This unit introduces students to fundamental programming concepts and the principles of systems development within business and organizational environments. Students will gain hands-on experience in writing, testing, and debugging code using a high-level programming language. Emphasis is placed on applying structured programming techniques, understanding software development life cycles (SDLC), and integrating programming logic into systems designed to support business operations. The unit also explores documentation practices, version control, and collaboration in development projects.

Tasks:

PA701 - Apply working knowledge of the System Development Life Cycle (system investigation/project proposal, analysis, design, code/test, implementation, and maintenance).

PA702 - Apply programming fundamentals (e.g., system processing, integration, generations of languages, binary code, object code, source code).

PA703 - Declare and manipulate various data type variables.

PA704 - Utilize program control structures (e.g., decisions, loops, functions/ subroutines, arithmetic, and logical operations).

PA705 - Create working graphical user interfaces (GUI).

PA706 - Create, test, and debug successful computer programs.

PA707 - Create thorough program documentation.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

Standard CC.3.5.9-10 B / Standard CC.3.5.11-12 B Determine the central ideas or conclusions of a text; etc.

Standard CC.3.5.9-10.C / Standard CC.3.5.11-12.C Follow precisely a complex multistep procedure, etc.

CRAFT & STRUCTURE GRADES 9-10-11-12

Standard CC.3.5.9-10. D / Standard CC.3.5.11-12.D Determine the meaning of symbols, key terms, and other domain specific words.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

Standard CC.3.5.9-10.G Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).

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Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

Standard CC.3.5.11-12. G Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.

Standard CC.3.5.11-12. H Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.

Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

- Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6

Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

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Standard CC.3.6.9-10.B Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.

PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

Standard CC.3.6.9-10.C Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.

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RESEARCH GRADES 9-10-11-12

Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

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RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.

3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.

3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:

Hands-On Coding Labs

Write and test code in a high-level programming language (e.g., Python, Java, C#).

Practice key programming concepts such as variables, conditionals, loops, functions, and arrays.

Implement small-scale programs to solve business-related problems.

Use IDEs such as Visual Studio Code, PyCharm, or Eclipse.

Incremental Programming Projects

Develop multi-stage programming projects that grow in complexity.

Projects may simulate real-world business tasks (e.g., payroll calculator, inventory tracker, or scheduling app).

Encourage modular design and code reuse.

System Development Life Cycle (SDLC) Simulations

Students work through all SDLC phases: planning, analysis, design, implementation, testing, and maintenance.

Create system documentation, flowcharts, data flow diagrams (DFDs), and pseudocode.

Use modeling tools such as Lucidchart or draw.io.

Code Review and Debugging Sessions

Peer or instructor-led code reviews to promote good coding practices and readability.

Analyze and debug faulty programs using debugging tools and logical tracing techniques.

Promote collaborative problem-solving and version control awareness.

Apply structured or object-oriented design methodologies.

Version Control and Team Collaboration

Introduce Git and GitHub for version control and team collaboration.

Complete group assignments that include branching, merging, and commit history tracking.

Reflect on best practices in collaborative development.

Group-Based System Development Project

Students work in teams to design and implement a working prototype of a business-oriented application.

Deliverables may include functional code, system documentation, flowcharts, and presentations.

Simulate real-world team roles: developer, analyst, tester, documentation specialist.

Algorithm Design Challenges

Weekly coding challenges or algorithm exercises to reinforce logical thinking.

Solve real-world problems such as sorting, searching, and data validation.

Promote algorithm efficiency and clarity.

Instructor Demonstrations

Step-by-step live or recorded demos of coding techniques, system modeling, or debugging.

Explain real-world applications of concepts such as recursion, exception handling, or class design.

Technical Writing and Documentation

Write internal and external program documentation (e.g., comments, user manuals, system requirement specs).

Prepare and submit SDLC-related documents as part of project milestones.

Discuss current tools, methodologies (e.g., Agile, Waterfall), and industry expectations.

Special Adaptations:

- Extended Time (assignments and/or testing)
- Graphic Organizer
- Chunking of Assignments/Material
- Preferential Seating
- Study Guide
- Taking Tests in Alternate Setting (or if requested)
- Small Group Instruction
- Positive Reinforcement
- Grading Rubric

Safety:

Observe proper Ergonomic practices.

Assessment:

Short quizzes to assess understanding of syntax, logic, and system design concepts.

Practical exams that require students to build or modify a working program under time constraints.

Resources/Equipment:

Programming Languages: Python, Java, C#, JavaScript

Development Environments: Visual Studio Code, Eclipse, PyCharm

Version Control: Git and GitHub

Modeling Tools: Lucidchart, draw.io, Microsoft Visio

Hyperlinks:

Monroe Career & Technical Institute

Course: Management Information Systems

Unit Name: Computer Maintenance/Troubleshooting

Number: 900 **Hours:** 152.00

Dates: Spring 2025

Description/Objectives:

This unit provides students with the knowledge and practical skills required to maintain, diagnose, and repair computer hardware and software systems in a business environment. Emphasis is placed on the identification of hardware components, understanding operating system functions, performing routine maintenance, and applying systematic troubleshooting procedures to resolve technical issues. Students will also explore best practices in preventative maintenance, safety procedures, and customer support as related to managing desktop and networked computer systems in an enterprise context.

Tasks:

PA901 - Apply the troubleshooting theory.

PA902 - Troubleshoot hardware problems and performance issues.

PA903 - Troubleshoot software problems and performance issues.

PA904 - Integrate common preventative maintenance techniques.

PA905 - Analyze and correct basic network problems and performance issues.

Standards / Assessment Anchors

Focus Anchor/Standard #1:

- Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5

Supporting Anchor/Standards:

KEY IDEAS/DETAILS GRADES 9-10-11-12

Standard CC.3.5.9-10.A / Standard CC.3.5.11-12A Cite specific textual evidence, etc.

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INTEGRATE KNOWLEDGE & IDEAS GRADES 9-10

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Standard CC.3.5.9-10. I Compare and contrast findings presented in a text to those from other sources, etc.

INTEGRATE KNOWLEDGE & IDEAS GRADES 11-12

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Standard CC.3.5.11-12. I Synthesize information from a range of sources into a coherent understanding.

RANGE OF READING GRADES 9-10-11-12

Standard CC.3.5.9-10.J / Standard CC.3.5.11-12.J By the end of grades 9-10, AND 11- 12, read and comprehend technical texts independently and proficiently.

Focus Anchor/Standard #2:

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Supporting Anchor/Standards:

TEXT TYPES AND PURPOSE GRADES 9-10-11-12

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PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10-11-12

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Standard CC.3.6.9-10.F Standard CC.3.6.11-12.F Conduct short and more sustained research to answer a question or solve a problem.

Standard CC.3.6.9-10.G. Standard CC.3.6.11-12.G Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.

Standard CC.3.6.9-10.H. Standard CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

RANGE OF WRITING GRADES 9-10-11-12

Standard CC.3.5.9-10.I & Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.

Connecting Anchor/Standard:

- PA SCIENCE, TECHNOLOGY & ENGINEERING, AND ENVIRONMENTAL LITERACY & SUSTAINABILITY STANDARDS (STEELS)

Supporting Anchor/Standards:

3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment.

3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

3.5.9-12.J Synthesize data and analyze trends to make decisions about technological products, systems, or processes.

3.5.9-12.K (ETS) Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

3.5.9-12.N Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.

3.5.9-12.P Apply a broad range of design skills to a design thinking process.

3.5.9-12.Y (ETS) Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.OO Use project management tools, strategies, and processes in planning, organizing, and controlling work.

3.5.9-12PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making

Instructional Activities:**Hands-On Hardware Labs**

Disassemble and reassemble desktop and laptop computers to identify internal components (e.g., motherboard, CPU, RAM, storage).

Install and configure peripheral devices (e.g., printers, monitors, keyboards).

Practice applying proper electrostatic discharge (ESD) precautions and tool usage.

Operating System Installation and Configuration

Install and configure Windows, Linux, or macOS operating systems.

Set up user accounts, permissions, and security settings.

Install device drivers and update system firmware/BIOS.

Preventative Maintenance Tasks

Perform disk cleanup, defragmentation, and system updates.

Run antivirus and anti-malware scans and analyze results.

Inspect physical systems for dust, damage, or signs of overheating.

Troubleshooting Simulations

Use troubleshooting flowcharts and logic-based processes to diagnose and resolve hardware and software issues.

Practice resolving common errors such as boot failures, blue screen errors, driver conflicts, and network connectivity issues.

Use virtual machine environments to simulate safe troubleshooting scenarios.

Diagnostic Tool Exercises

Use system tools such as Device Manager, Task Manager, Event Viewer, and System Information.

Run hardware diagnostic software (e.g., MemTest86, CrystalDiskInfo) to evaluate system performance and stability.

Utilize command-line tools (e.g., ping, ipconfig, sfc, chkdsk) for basic diagnostics.

Network Troubleshooting Labs

Diagnose basic wired and wireless network problems (e.g., DHCP conflicts, IP configuration errors).

Set up and test routers, switches, and connectivity between multiple devices.

Use tools such as network cable testers or Wireshark (introductory level).

Help Desk Role-Playing

Simulate customer support scenarios involving hardware/software issues.

Practice professional communication, ticket documentation, and escalation procedures.

Evaluate student responses for clarity, accuracy, and professionalism.

Instructor Demonstrations

Live or recorded walkthroughs of diagnostic processes, hardware installations, and software tools.

Demonstrations of common failure modes and effective troubleshooting strategies.

Collaborative Group Activities

Team-based repair simulations where students must work together to identify and fix system issues.

Peer evaluations and group troubleshooting reports.

Technical Documentation Practice

Create step-by-step troubleshooting guides or maintenance checklists.

Complete and submit service reports or help desk tickets with technical accuracy.

Capstone or Final Project

Diagnose and repair a malfunctioning system from start to finish, including documentation, part replacement, and reporting.

Present findings and procedures to the class.

Special Adaptations:

- Extended Time (assignments and/or testing)
- Chunking of Assignments/Material
- Study Guide
- Adapted Tests and/or Assignments
- Taking Tests in Alternate Setting (or if requested)
- Small Group Instruction
- Positive Reinforcement
- Access to School Counselor
- Grading Rubric

Safety:

Observe proper Ergonomic practices.

Assessment:

Periodic quizzes to assess understanding of terminology, components, and troubleshooting principles.
Hands-on practical assessments requiring students to diagnose and resolve a set of simulated problems.

Resources/Equipment:

Hardware kits (for desktops/laptops)
Operating systems: Windows 10/11, Linux (Ubuntu), macOS
Diagnostic software: CPU-Z, HWMonitor, Malwarebytes, manufacturer-specific tools
Network tools: Routers, switches, patch cables, virtual labs
Learning platforms: TestOut, CompTIA Labs, or custom virtual environments

Hyperlinks: