Professional Technical Studies – Table of Contents

Strand:
PT-DPC1   **Academics**
Students apply English language arts, mathematics, science, and social studies content area skills.

Standard: **PT-DPC1a:**   The student will employ basic methods of data collection and analysis to provide information for projects so as to:

Components: **PT-DPC1a.1:**   access research methods available to formulate project planning and problem solving; and

                       PT-DPC1a.2:   provide appropriate precedents for development of a project.

Standard: **PT-DPC1b:**   The student will use appropriate formulas to determine ratios, fractions, and proportion measures so as to:

Components: **PT-DPC1b.1:**   calculate ratios, fractions, and proportion measures; and

                       PT-DPC1b.2:   use ratios, fractions, and proportion measures to perform measurement tasks.

Strand:
PT-DPC2   **Communication Skills**
Students use information technology to express and interpret information.

Standard: **PT-DPC2a:**   The student will work with potential clients so as to:

Component: **PT-DPC2a.1:**   make a presentation to explain a concept.

Strand:
PT-DPC3   **Problem Solving and Critical Thinking**
Students use information technology to define, test, and solve problems.

Standard: **PT-DPC3a:**   The student will identify the relationship between available resources and requirements of a project or problem that needs to be solved in order to accomplish realistic planning so as to:

Components: **PT-DPC3a.1:**   estimate resources/materials required for a specific project/problem—including time management, labor management, job management, and job site obligations —in order to effectively plan;

                       PT-DPC3a.2:   use available resources/materials effectively to complete project or resolve a problem; and

                       PT-DPC3a.3:   determine alternative solutions for a specific project/problem in order to effectively plan.

Standard: **PT-DPC3b:**   The student will evaluate and adjust plans/schedules to respond to unexpected events and conditions so as to:

Components: **PT-DPC3b.1:**   adjust plans and schedules to meet project needs;

                       PT-DCP3b.2:   identify and assess critical situations as they arise to resolve issues; and

                       PT-DPC3b.3:   provide a project update to track changes necessitated by unexpected events and conditions.

Standard: **PT-DPC3c:**   The student will synthesize and report conditions to keep the organization apprised of progress and problems so as to:

Component: **PT-DPC3c.1:**   provide a project update to keep stakeholders up to date.

Strand: **PT-DPC4**	**Information Technology Applications** Students use computers, networks, and communication technology to access, organize, process, transmit, and communicate information.	
Standard:	**PT-DPC4a:**	The student will use information technology tools specific to architecture and construction to access, manage, integrate, and create information so as to:
Components:	**PT-DPC4a.1:**	manage personal schedule and contact information;
	PT-DPC4a.2:	create memos and notes; and
	PT-DPC4a.3:	use a CAD system to perform drafting duties.
Standard:	**PT-DPC4b:**	The student will use electronic mail applications so as to:
Components:	**PT-DPC4b.1:**	use e-mail to communicate within and across organizations; and
	PT-DPC4b.2:	use e-mail to share files and documents.
Standard:	**PT-DPC4c:**	The student will use Internet applications so as to:
Components:	**PT-DPC4c.1:**	search for information and resources; and
	PT-DPC4c.2:	access and evaluate Internet resources.
Standard:	**PT-DPC4d:**	The student will use writing and publishing applications so as to:
Component:	**PT-DPC4d.1:**	prepare simple documents and other business communications.
Standard:	**PT-DPC4e:**	The student will use spreadsheet applications so as to:
Components:	**PT-DPC4e.1:**	create a spreadsheet; and
	PT-DPC4e.2:	perform calculations and analysis on data.
Standard:	**PT-DPC4f:**	The student will use computer operations applications so as to:
Components:	PT-DPC4f.1:	manage computer operations; and
	PT-DPC4f.2:	manage file storage.
Strand: **PT-DPC5**	**Systems** Students use an organized set of ideas and principles to explain or interact among structured organizations.	
Standard:	**PT-DPC5a:**	The student will integrate structural systems, environmental systems, safety systems, building envelope systems, and building service systems to design modern buildings so as to:
Component:	**PT-DPC5a.1:**	assess building systems and their interrelationships to development design criteria.
Standard:	**PT-DPC5b:**	The student will review traditional project phases and various roles in them to plan for implementation phases within a project so as to:
Component:	**PT-DPC5b.1:**	relate traditional project phases and various roles within them to a current project.
Standard:	**PT-DPC5c:**	The student will examine the relationship of roles and responsibilities between trades/professions to complete a project/job so as to:
Components:	**PT-DPC5c.1:**	plan, organize, schedule, and manage a project/job to optimize workflow sequence;
	PT-DPC5c.2:	use time management skills to schedule a project/job; and

	PT-DPC5c.3:	recognize relationships between trades/professions to facilitate smooth workflow.
Standard:	**PT-DPC5d:**	The student will examine all aspects of the built environment and its systems to complete project planning so as to:
Component:	**PT-DPC5d.1:**	align and incorporate the built environment and its systems to the complete project.
Standard:	**PT-DPC5e:**	The student will apply industry standards and practices for quality to ensure quality work so as to:
Components:	**PT-DPC5e.1:**	identify industry standards and practices in order to incorporate quality into projects; and
	PT-DPC5e.2:	use industry standards and practices to evaluate workmanship.

Strand:
PT-DPC6

Safety, Health, and Environment
Students understand the importance of safety, health, environmental, and regulatory compliance in the workplace.

Standard:	**PT-DPC6a:**	The student will apply the basic principles of environmental impact to enhance project acceptance and quality so as to:
Component:	**PT-DPC6a.1:**	evaluate and align sustainable design elements to add value to a project.
Standard:	**PT-DPC6b:**	The student will apply design requirements to accommodate people with varying physical abilities so as to:
Component:	**PT-DPC6b.1:**	study the "Americans with Disabilities Act" in order to build compliance into project designs.

Strand:
PT-DPC7

Leadership and Teamwork
Students collaborate with others to accomplish goals and objectives.

Standard:	**PT-DPC7a:**	The student will incorporate the diversity of needs, values, and social patterns in project design so as to:
Component:	**PT-DPC7a.1:**	identify Western, non-Western, national, regional traditions and heritage to express diversity in project design as required.
Standard:	**PT-DPC7b:**	The student will establish specific goals to manage project assignments in a timely manner so as to:
Components:	**PT-DPC7b.1:**	establish project goals in order to meet project specifications and deadlines; and
	PT-DPC7b.2:	organize work teams to effectively manage assignments.
Standard:	**PT-DPC7c:**	The student will work as an individual and as a team member to accomplish assignments so as to:
Components:	**PT-DPC7c.1:**	use human relations skills to work cooperatively with coworkers representing different cultures, genders, and backgrounds;
	PT-DPC7c.2:	track team goals to contribute constructively and positively to the team;
	PT-DPC7c.3:	match team members to appropriate activities; and
	PT-DPC7c.4:	manage personal skills to accomplish assignments.
Standard:	**PT-DPC7d:**	The student will use mentoring skills to inspire others to achieve so as to:
Component:	**PT-DPC7d.1:**	use motivational techniques to enhance performance in others.

Strand:
PT-DPC8   **Architectural Technology Applications**
Students use computers, networks, drafting and communication technology to
access, organize, process, produce, transmit and communicate information.

Standard: **PT-DPC8a:**   The student will use drawings and computer-generated plans to
develop a technical set of drawings so as to:

Component: **PT-DPC8a.1:** identify client's needs and wants to develop criteria for a set of
technical drawings.

Standard: **PT-DPC8b:**   The student will employ appropriate representational media to
convey essential formal elements so as to:

Components: **PT-DPC8b.1:** use two- and three-dimensional drawings to convey graphic
information;

PT-DPC8b.2: reference drawings and sketches to build models; and

PT-DPC8b.3: use appropriate computer technology to convey graphic
information.

Standard: **PT-DPC8c:**   The student will study principles, conventions, standards,
applications, and restrictions pertaining to the manufacture and
use of construction materials, components, and assemblies to
incorporate into project design so as to:

Components: **PT-DPC8c.1:** evaluate and select building materials and assemblies to meet
project specifications; and

PT-DPC8c.2: use appropriate combinations of building materials and
components to satisfy the requirements of building programs.

Standard: **PT-DPC8d:**   The student will apply basic organizational, spatial, structural,
and construction principles to the design of the interior and
exterior spaces so as to:

Component: **PT-DPC8d.1:** evaluate and select the most appropriate solution.

Strand:
PT-DPC9   **Employability and Career Development**
Students use computers, networks, and communication technology to access,
organize, process, transmit, and communicate information.

Standard: **PT-DPC9a:**   The student will exhibit a positive work ethic to comply with
employment requirements so as to:

Component: **PT-DPC9a.1:** exhibit behaviors showing reliability and dependability.

Standard: **PT-DPC9b:**   The student will recognize requirements for career advancement
to plan for continuing education and training so as to:

Components: **PT-DPC9b.1:** identify opportunities for career advancement to formulate career
goals;

PT-DPC9b.2: maintain positive interpersonal skills to enhance potential for
advancement;

PT-DPC9b.3: pursue education and training opportunities to acquire skills
necessary for career advancement;

PT-DPC9b.4: read trade magazines and journals, manufacturers' catalogues,
industry publications, and material on Internet sites to keep
current on industry trends; and

PT-DPC9b.5: examine the organization and structure of various segments of
the industry to prepare for career advancement.

Standard:	**PT-DPC9c:**	The student will recognize the responsibilities and personal characteristics of a professional craftsperson to develop personal goals for professionalism so as to:
Components:	**PT-DPC9c.1:**	research workplace/jobsite information to identify appropriate craft responsibilities and personal characteristics; and
	PT-DPC9c.2:	present a professional image in the workplace/jobsite to enhance career advancement.
Standard:	**PT-DPC9d:**	The student will maintain a career portfolio to document knowledge, skills, and abilities so as to:
Components:	**PT-DPC9d.1:**	select educational and work history highlights to create a personal resume;
	PT-DPC9d.2:	contact professional references to acquire recommendations; and
	PT-DPC9d.3:	maintain a record of work experiences, licenses, certifications, and education to build a portfolio.

Professional Technical Studies: Arts, A/V Technology & Communications Cluster
Audio & Video Technology & Film Pathway

Strand:
PT-AVT1   **Audio and Visual Technology and Film**
Students use information technology to design, produce, exhibit, and publish multimedia content.

Standard:	**PT-AVT1a:**	The student will explore career opportunities in audio and video technology so as to:
Components:	**PT-AVT1a.1:**	exhibit knowledge of the history of film and how it is specifically related to the industry today;
	PT-AVT1a.2:	analyze various careers and their job descriptions in audio and video technology and film;
	PT-AVT1a.3:	define the terminology associated with audio and video technology and film production; and
	PT-AVT1a.4:	comprehend the value of a broad general knowledge of fine arts and cultural and regional diversity.
Standard:	**PT-AVT1b:**	The student will apply knowledge of equipment and skills related to audio production so as to:
Components:	**PT-AVT1b.1:**	comprehend the types of microphones, pickup patterns, and techniques required for a variety of audio presentations;
	PT-AVT1b.2:	apply knowledge of audio equipment for productions, including basic recording equipment, equalizers, mixing console, and quality-monitoring equipment;
	PT-AVT1b.3:	exhibit knowledge of analog and digital audio formats;
	PT-AVT1b.4:	illustrate the techniques required for synchronization of an audio with video and multiple sound tracks; and
	PT-AVT1b.5:	demonstrate writing audio scripts for various types of programs.
Standard:	**PT-AVT1c:**	The student will apply knowledge of equipment and skills related to video production so as to:
Components:	**PT-AVT1c.1:**	apply knowledge of lighting requirements for a planned production;
	PT-AVT1c.2:	apply knowledge of analog and digital video formats;
	PT-AVT1c.3:	demonstrate operation and maintenance of a video system;
	PT-AVT1c.4:	demonstrate knowledge of camera operations, video signals, and video formats;
	PT-AVT1c.5:	exhibit knowledge of computer-based development of video production and editing, with an emphasis on digital technology;
	PT-AVT1c.6:	describe how to frame and maintain picture composition;
	PT-AVT1c.7:	demonstrate focusing and adjusting images and performing pans and zooms; and
	PT-AVT1c.8:	analyze production functions.
Standard:	**PT-AVT1d:**	The student will exhibit knowledge of editing audio and video productions so as to:
Components:	**PT-AVT1d.1:**	identify the basic functions of, and resources for, editing;
	PT-AVT1d.2:	apply knowledge of basic editing to both linear and nonlinear systems; and
	PT-AVT1d.3:	apply knowledge of control peripherals used for editing.

Standard:	**PT-AVT1e:**	The student will demonstrate technical production support for audio, visual, and film presentations so as to:
Components:	**PT-AVT1e.1:**	demonstrate repair and servicing of transmitting and receiving systems;
	PT-AVT1e.2:	apply knowledge of wireless and wired transmission systems;
	PT-AVT1e.3:	demonstrate installation of cabling for audio and video productions;
	PT-AVT1e.4:	demonstrate the installation of a wireless audio-video system; and
	PT-AVT1e.5:	demonstrate writing audio scripts for various types of programs.
Standard:	**PT-AVT1f:**	The student will exhibit the knowledge and skills required to design audio-video presentations so as to:
Components:	**PT-AVT1f.1:**	apply knowledge of the critical elements in designing a production throughout the stages of pre-production, production, and post-production;
	PT-AVT1f.2:	create a short script and identify the resources needed to begin the production;
	PT-AVT1f.3:	identify the activities associated with pre-production, production, and post-production;
	PT-AVT1f.4:	analyze the script and storyboard development processes for successful production;
	PT-AVT1f.5:	execute production of the script; and
	PT-AVT1f.6:	critique a production to determine how the various elements resulted in a successful or unsuccessful presentation.
Standard:	**PT-AVT1g:**	The student will exhibit ethical conduct in writing, creating, printing, broadcasting, and performing so as to:
Components:	**PT-AVT1g.1:**	analyze ethical principals of decision making related to clients, customers, fellow workers, and others;
	PT-AVT1g.2:	analyze ethical conduct that provides proper credit to those whose ideas and content have been used; and
	PT-AVT1g.3:	identify the proper use of proprietary information.
Standard:	**PT-AVT1h:**	The student will apply knowledge of laws affecting this career cluster so as to:
Components:	**PT-AVT1h.1:**	analyze the copyright laws in relation to seeking formal permission to use materials;
	PT-AVT1h.2:	analyze the First Amendment, FCC, the Freedom of Information Act, libel laws, and other regulations for the compliance issues relevant to this cluster; and
	PT-AVT1h.3:	analyze the liabilities associated with productions and performances, media, and telecommunications installations.

Strand:
PT-AIS1 **Information Processing**
Students use information technology to input, analyze, organize, and share information.

Standard: **PT-AIS1a:** The student will use word-processing software to produce documents so as to:

Components: **PT-AIS1a.1:** use software techniques to insert a graphic in a document;
PT-AIS1a.2: use software commands to design a table;
PT-AIS1a.3: use computer software to design forms;
PT-AIS1a.4: apply computer skills to complete preprinted forms;
PT-AIS1a.5: use a scanner to scan data and insert data into a document electronically; and
PT-AIS1a.6: use software commands to merge text.

Standard: **PT-AIS1b:** The student will prepare documents for presentation so as to:

Components: **PT-AIS1b.1:** use traditional notation to proofread and edit documents;
PT-AIS1b.2: use resource materials to prepare documents; and
PT-AIS1b.3: secure document notarization.

Standard: **PT-AIS1c:** The student will use database software to produce documents so as to:

Components: **PT-AIS1c.1:** use database software to create databases;
PT-AIS1c.2: use data-entry techniques to enter information in databases; and
PT-AIS1c.3: use appropriate commands to retrieve data and create reports from database.

Standard: **PT-AIS1d:** The student will use spreadsheet software to produce documents so as to:

Components: **PT-AIS1d.1:** use spreadsheet software to create spreadsheets;
PT-AIS1d.2: enter appropriate formulas and functions in a document; and
PT-AIS1d.3: create components to analyze spreadsheet data.

Standard: **PT-AIS1e:** The student will choose appropriate software to enter information so as to:

Components: **PT-AIS1e.1:** analyze, compare, and contrast available software packages to use;
PT-AIS1e.2: use appropriate software to generate information reports; and
PT-AIS1e.3: review software packages to select the best choice.

Strand:
PT-AIS2 **Management of Records and Files**
Students use information technology to archive information.

Standard: **PT-AIS2a:** The student will establish and follow procedures for electronic filing for a variety of file types so as to:

Components: **PT-AIS2a.1:** establish document priorities to interpret file hierarchy;
PT-AIS2a.2: employ computer skills to manage electronic files; and
PT-AIS2a.3: retain, transfer, and discard files as necessary to manage records.

Strand:
PT-AIS3   **Organizational Skills**
                              Students use systematic planning to complete tasks.

Standard: **PT-AIS3a:**   The student will apply planning and time-management principles
                                   to accomplish workplace efficiency and achieve company
                                   objectives so as to:

Components: **PT-AIS3a.1:**   list appointments and itineraries to maintain calendars;
                  PT-AIS3a.2:   set priorities and schedule work to organize workload; and
                  PT-AIS3a.3:   exercise good housekeeping to maintain a clean and functional
                                   work environment.

Standard: **PT-AIS3b:**   The student will plan and participate in meetings so as to:

Components: **PT-AIS3b.1:**   assemble materials to prepare for meetings; and
                  PT-AIS3b.2:   take notes and handle materials to support a meeting.

Standard: **PT-AIS3c:**   The student will prepare an inventory and maintenance schedule
                                   to maintain and manage a variety of data systems so as to:

Components: **PT-AIS3c.1:**   determine equipment, supplies, and training needed to maintain
                                   data systems; and
                  PT-AIS3c.2:   define equipment, supply, and training maintenance schedule.

Strand:
PT-AIS4   **Communication Skills**
                              Students use information technology to express and interpret information.

Standard: **PT-AIS4a:**   The student will select appropriate formats to prepare internal
                                   and external written documents so as to:

Components: **PT-AIS4a.1:**   select format and procedure to produce memoranda appropriate
                                   for a given purpose;
                  PT-AIS4a.2:   select document type and layout to produce business letters; and
                  PT-AIS4a.3:   select appropriate writing method to produce a variety of reports.

Standard: **PT-AIS4b:**   The student will compose and prepare written communications to
                                   convey technical concepts and company information so as to:

Components: **PT-AIS4b.1:**   use writing and organizational skills to construct reports, graphs,
                                   and tables;
                  PT-AIS4b.2:   use technology to design and develop multimedia materials; and
                  PT-AIS4b.3:   use description of audience and purpose to prepare written
                                   documents.

Strand:
PT-AIS5   **Financial Skills**
                              Students use information technology to input, manipulate, communicate, and
                              archive financial information.

Standard: **PT-AIS5a:**   The student will maintain records and reports to manage cash
                                   and banking procedures so as to:

Components: **PT-AIS5a.1:**   record transactions to manage cash-fund accounts;
                  PT-AIS5a.2:   tally receipts and proof work to prepare bank deposits; and
                  PT-AIS5a.3:   practice good bookkeeping guidelines to reconcile bank
                                   statements.

Standard: **PT-AIS5b:**   The student will apply computational skills to computerized
                                   financial documents so as to:

Component: **PT-AIS5b.1:** operate appropriate financial software to generate usable data.

Strand:
PT-BFM1   **Computational Skills**
Students use information technology to perform calculations.

Standard: **PT-BFM1a:**   The student will apply computational skills in written documents so as to:

Components: **PT-BFM1a.1:**   observe policies and regulations when performing calculations for a given situation

                  PT-BFM1a.2:   calculate and enter data for a given situation on appropriate forms or reports; and

                  PT-BFM1a.3:   recheck computations in written documents for accuracy and quality.

Standard: **PT-BFM1b:**   The student will apply computational skills to computerized financial documents so as to:

Components: **PT-BFM1b.1:**   operate appropriate financial software to generate usable data; and

                  PT-BFM1b.2:   operate electronic spreadsheet software to create formulas and reports.

Strand:
PT-BFM2   **Organizational Skills**
Students use systematic planning to complete tasks.

Standard: **PT-BFM2a:**   The student will use organizational skills to perform accounting and financial operations so as to:

Components: **PT-BFM2a.1:**   record and schedule appointments and calendars to manage functions;

                  PT-BFM2a.2:   organize work priorities to ensure deadlines will be met; and

                  PT-BFM2a.3:   organize documents, forms, and manuals to maintain orderly flow of work.

Strand:
PT-BFM3   **Policies and Regulations**
Students adhere to legal policies and regulations and use information technology to implement policies and regulations.

Standard: **PT-BFM3a:**   The student will apply federal, state, and local laws, rules, and regulations to guide storage and retention of financial records so as to:

Components: **PT-BFM3a.1:**   adapt accounting and record-keeping functions to current computerized systems; and

                  PT-BFM3a.2:   establish backup procedures for maintaining electronic records.

Standard: **PT-BFM3b:**   The student will identify, apply, and keep current with laws and regulations that affect financial and accounting practices so as to:

Components: **PT-BFM3b.1:**   understand basic financial laws and regulations as applied to financial and accounting practices;

                  PT-DCP3b.2:   examine the purposes of financial laws, policies, and regulations to apply them to a given situation; and

                  PT-BFM3b.3:   maintain knowledge of current financial laws, policies, and regulations to ensure continued compliance in financial and accounting practices.

Strand:
PT-BFM4   **Analysis and Interpretation of Data**
Students use information technology to process and test information.

Standard: **PT-BFM4a:**   The student will analyze and interpret financial data to produce accurate reports so as to:

Components: **PT-BFM4a.1:**   understand the purpose of financial statements;

PT-BFM4a.2:   analyze financial statements to verify information; and

PT-BFM4a.3:   interpret financial data for planning purposes.

Strand:
PT-BFM5   **Accounting**
Students use information technology to record and analyze the cost of materials.

Standard: **PT-BFM5a:**   The student will examine elements of an accounting system to acquire skills in applying good accounting practices so as to:

Component: **PT-BFM5a.1:**   evaluate assets and liabilities to show their functions in an accounting system.

Standard: **PT-BFM5b:**   The student will record business transactions to track business activities so as to:

Components: **PT-BFM5b.1:**   create a chart of accounts to show the variety of accounts activities in a system; and

PT-BFM5b.2:   record transactions.

Standard: **PT-BFM5c:**   The student will collect financial data to report required financial information so as to:

Component: **PT-BFM5c.1:**   assemble appropriate accounting elements to prepare financial statements.

Strand:
PT-MAN1   **Organizational Skills**
Students use systematic planning to complete tasks.

Standard: **PT-MAN1a:**   The student will develop and implement short- and long-term strategic plans to manage growth, profit, and goals within a specific market segment so as to:

Components: **PT-MAN1a.1:**   complete effective business plans to meet varied business needs;

PT-MAN1a.2:   develop and implement annual performance-based operating plans to manage long-range company goals; and

PT-MAN1a.3:   develop and implement business plans to serve division and department subjects.

Standard: **PT-MAN1b:**   The student will evaluate employee performance to provide timely and appropriate responses to personnel issues so as to:

Components: **PT-MAN1b.1:**   apply performance standards to evaluate employees; and

PT-MAN1b.2:   develop timely responses to employee performance evaluations.

Standard: **PT-MAN1c:**   The student will organize the various business services to address all company components so as to:

Components: **PT-MAN1c.1:**   analyze the individual role and the role of the assigned unit to the business;

PT-MAN1c.2:   develop policies and procedures to provide support for the organization; and

PT-MAN1c.3:   organize business components to ensure quality products/services are delivered on time.

Strand:
PT-MAN2   **Communication Skills**
Students use information technology to express and interpret information.

Standard: **PT-MAN2a:**   The student will assume appropriate roles to create, deliver, receive, and manage business communications in the workplace so as to:

Components: **PT-MAN2a.1:**   identify an audience and create communications, support statistics for internal and external audiences;

PT-MAN2a.2:   assume the necessary role to perform the responsibilities of delivering a message;

PT-MAN2a.3:   assume the necessary role to perform the responsibilities of receiving a message;

PT-MAN2a.4:   manage the broad scope of business communications to process, document, and store information efficiently and appropriately; and

PT-MAN2a.5:   prepare appropriate materials to reply to inquiries that require a considered response.

Strand:
PT-MAN3   **Leadership and Teamwork**
Students collaborate with others to accomplish goals and objectives.

Standard: **PT-MAN3a:**   The student will motivate and supervise personnel to achieve completion of projects and company goals so as to:

Components:	**PT-MAN3a.1:**	exhibit behaviors and actions to effectively motivate and lead people;
	PT-MAN3a.2:	exhibit behaviors and actions to effectively motivate and lead change; and
	PT-MAN3a.3:	exhibit behaviors and actions to effectively motivate and promote the use of teamwork in the workplace.
Standard:	**PT-MAN3b:**	The student will direct and supervise personnel to complete company goals and projects so as to:
Components:	**PT-MAN3b.1:**	exhibit the actions and behaviors most effective for supervising and directing the financial resources;
	PT-MAN3b.2:	exhibit the actions and behaviors most effective for supervising and directing human resources for a company;
	PT-MAN3b.3:	exhibit the actions and behaviors most effective for supervising and directing the external relationships in your area of responsibility;
	PT-MAN3b.4:	exhibit the actions and behaviors most effective to supervise and direct the knowledge/information resources; and
	PT-MAN3b.5:	exhibit the actions and behaviors most effective for supervising and directing company tangibles.

Strand:
PT-MAN4   **Maintaining Facilities, Equipment, and Supplies**
Students use information technology to manage facilities, equipment, and supplies.

Standard:	**PT-MAN4a:**	The student will develop and implement plans and standard operating procedures to ensure maintenance of facilities, equipment, and supplies so as to:
Components:	**PT-MAN4a.1:**	describe the types and requirements of all company facilities, equipment, and supply chains necessary to manage physical properties of company structure;
	PT-MAN4a.2:	manage the present day-to-day operations and maintenance of all company facilities, equipment, and supply chains to ensure physical integrity of all systems; and
	PT-MAN4a.3:	determine adjustments needed and plan for future growth in facilities, equipment, and supply chains to enable profitable operation and growth.

Strand:
PT-MAN5   **Project Management**
Students manage project tasks, timelines, and goals.

Standard:	**PT-MAN5a:**	The student will use performance standards to monitor progress of personnel, finance, and other functional areas so as to:
Components:	**PT-MAN5a.1:**	identify and communicate performance standards and operating policies and procedures, such as ISO (International Standards Operations) to personnel;
	PT-MAN5a.2:	evaluate results of performance standards to develop an effective tracking system; and
	PT-MAN5a.3:	analyze performance reports and make adjustments to recognize successes and identify shortfalls.

Strand:
PT-MAN6　　　　　**Facilitating Change**
Students identify and implement improvement opportunities.

Standard:	**PT-MAN6a:**	The student will evaluate opportunities to determine potential company changes and implement strategies for catalyzing and guiding changes so as to:
Components:	**PT-MAN6a.1:**	evaluate opportunities to determine potential company changes; and
	PT-MAN6a.2:	implement the improvement process to guide the change.

Strand:
PT-MAN7　　　　　**Ethics and Legal Responsibilities**
Students understand the importance of ethical and legal guidelines in the workplace.

Standard:	**PT-MAN7a:**	The student will apply business laws and regulations to business situations so as to:
Components:	**PT-MAN7a.1:**	identify resources to keep business-related laws and regulations current;
	PT-MAN7a.2:	apply knowledge of copyright laws to business situations;
	PT-MAN7a.3:	apply ethical principles to decision making related to clients, customers, and coworkers; and
	PT-MAN7a.4:	apply professional conduct to business situations.

Strand:
PT-MAN8　　　　　**Pricing**
Students understand product pricing.

Standard:	**PT-MAN8a:**	The student will apply a variety of approaches to determine the appropriate price for a product/service so as to:
Components:	**PT-MAN8a.1:**	use different pricing methods including cost-based pricing, demand-based pricing, competition-based pricing, psychological pricing, and promotional pricing to calculate the price of products/services; and
	PT-MAN8a.2:	determine company goals and external issues necessary to determine pricing.
Standard:	**PT-MAN8b:**	The student will relate factors that influence price to a product's actual price so as to:
Components:	**PT-MAN8b.1:**	list and discuss the factors that influence price;
	PT-MAN8b.2:	identify and match key pricing factors to specific products;
	PT-MAN8b.3:	prioritize pricing factors and apply a process to calculate prices;
	PT-MAN8b.4:	determine the total product cost and the break-even point;
	PT-MAN8b.5:	identify the impact of external (uncontrollable) factors and consumer practices on product prices; and
	PT-MAN8b.6:	determine pricing to maximize profit.
Standard:	**PT-MAN8c:**	The student will evaluate customers and their needs to determine pricing of products and services so as to:
Components:	**PT-MAN8c.1:**	list and discuss the concept of customer needs as it applies to the price of a specific product/service; and
	PT-MAN8c.2:	recognize geographic needs of product to determine price.

Standard:	**PT-MAN8d:**	The student will apply pricing strategies to meet competition so as to:
Components:	**PT-MAN8d.1:**	identify the competitive practices to anticipate the future activities of competitors;
	PT-MAN8d.2:	identify and apply the process of altering pricing to meet competitive situations; and
	PT-MAN8d.3:	evaluate pricing formats to find the best solution to price altering.
Standard:	**PT-MAN8e:**	The student will apply technology to identify a variety of approaches for determining and monitoring pricing so as to:
Components:	**PT-MAN8e.1:**	identify the ways that technology can be used to impact the pricing function; and
	PT-MAN8e.2:	explain the specific applications of technology to determine pricing.
Standard:	**PT-MAN8f:**	The student will apply strategies for determining and adjusting prices to maximize return and meet customer's perceptions of value so as to:
Components:	**PT-MAN8f.1:**	develop objectives, policies, and strategies to make pricing decisions; and
	PT-MAN8f.2:	use technology to determine prices.

Strand: **PT-MAN9**	**Customer Service** Students analyze customer needs and requirements.	
Standard:	**PT-MAN9a:**	The student will use strategies necessary to determine appropriate level of customer service so as to:
Components:	**PT-MAN9a.1:**	determine the appropriate activities to achieve high-quality customer service; and
	PT-MAN9a.2:	determine activities necessary to offer the benefits of self-service to customers.

Strand: **PT-MAN10**	**Selling** Students understand the art of selling.	
Standard:	**PT-MAN10a:**	The student will take necessary action to determine customer needs and wants and to respond through planned, personalized communication that influences purchase decisions so as to:
Components:	**PT-MAN10a.1:**	demonstrate techniques to achieve personal selling; and
	PT-MAN10a.2:	demonstrate appropriate techniques to achieve electronic selling.
Standard:	**PT-MAN10b:**	The student will establish selling philosophies to develop customer loyalty and profitability so as to:
Components:	**PT-MAN10b.1:**	develop selling policies that encourage long-term client relationships; and
	PT-MAN10b.2:	analyze current business conditions to isolate external factors affecting the selling relationship.
Standard:	**PT-MAN10c:**	The student will use product and company attributes to help the customer understand benefit outcomes so as to:
Components:	**PT-MAN10c.1:**	develop benefit statements to show their unique relationship to the company

	PT-MAN10c.2:	develop benefit statements to show their relationship to a product or service; and
	PT-MAN10c.3:	identify value-added considerations to show their relationship to a product or service.
Standard:	**PT-MAN10d:**	The student will analyze client characteristics to facilitate the buying process so as to:
Components:	**PT-MAN10d.1:**	identify client purchasing processes to integrate significant elements into buying process; and
	PT-MAN10d.2:	determine motives to help define the customer buying process.
Standard:	**PT-MAN10e:**	The student will use accepted processes to complete the buying process so as to:
Components:	**PT-MAN10e.1:**	conduct prospecting to maintain or increase client base;
	PT-MAN10e.2:	make a sales presentation to encourage customers to buy a product or use a service; and
	PT-MAN10e.3:	develop and implement a follow-up plan to enhance satisfaction and encourage a continuing relationship.

Strand:
PT-MAN11   **Distribution**
Students understand product distribution.

Standard:	**PT-MAN11a:**	The student will identify and use standard processes to move, store, locate, and/or transfer ownership of goods and services so as to:
Component:	**PT-MAN11a.1:**	determine appropriate channels to distribute goods and services.

Strand:
PT-MAN12   **Promotion**
Students understand product promotion.

Standard:	**PT-MAN12a:**	The student will identify types of promotion and the promotional mix, and disseminate information about products/services or company to achieve a desired outcome for a product or service so as to:
Components:	**PT-MAN12a.1:**	develop a plan to promote a product/service;
	PT-MAN12a.2:	prepare an advertising plan to promote a product/service;
	PT-MAN12a.3:	use various forms of publicity to promote product/service;
	PT-MAN12a.4:	exhibit a clear and concise understanding of ethical behavior to promote a product/service; and
	PT-MAN12a.5:	develop a plan to use all forms of promotional mix to develop a well-rounded sales campaign.

Strand:
PT-MAN13   **Communication Skills**
Students use information technology to express and interpret information.

Standard:	**PT-MAN13a:**	The student will use concepts, strategies, and systems necessary to interact effectively with others so as to:
Components:	**PT-MAN13a.1:**	apply effective presentation skills to a marketing/sales situation; and
	PT-MAN13a.2:	exhibit verbal communication skills to provide information at staff meetings and trade shows.

Standard:	**PT-MAN13b:**	The student will develop and deliver effective customer relations skills to provide good customer service so as to:
Component:	**PT-MAN13b.1:**	share ideas about selling and maintaining products/services with customers and coworkers to maintain sales continuity.
Standard:	**PT-MAN13c:**	The student will provide ethical, legal, and culturally sensitive information to customers and coworkers so as to:
Components:	**PT-MAN13c.1:**	exercise cultural sensitivity to interact with customers and coworkers; and
	PT-MAN13c.2:	examine ethical and legal issues to provide information in a given marketing situation.
Strand: **PT-MAN14**		**Product/Service Management** Students explore methods for managing a variety of products and services.
Standard:	**PT-MAN14a:**	The student will apply the concepts and processes necessary to obtain, develop, maintain, and improve a product/service mix so as to:
Components:	**PT-MAN14a.1:**	examine and compare consumer products/services to industrial products/services;
	PT-MAN14a.2:	develop a product/service mix to service a selected target market; and
	PT-MAN14a.3:	conduct research for potential new products/services to meet customer needs.
Standard:	**PT-MAN14b:**	The student will apply the product/service management function to a marketing business so as to:
Components:	**PT-MAN14b.1:**	explain the importance of product/service management to a marketing business;
	PT-MAN14b.2:	explain the impact of product life cycles on marketing decisions;
	PT-MAN14b.3:	use technology to perform functions of product/service management; and
	PT-MAN14b.4:	explain the relationship of business ethics to product/service management.
Standard:	**PT-MAN14c:**	The student will apply various types of quality assurance to product/service management so as to:
Components:	**PT-MAN14c.1:**	maximize the use of grades and standards to product/service management;
	PT-MAN14c.2:	explain the importance of warranties and guarantees to product/service management; and
	PT-MAN14c.3:	identify the provisions of appropriate agencies to protect consumers.
Standard:	**PT-MAN14d:**	The student will create a product mix that meets the needs of customers and produces a profit for the company so as to:
Components:	**PT-MAN14d.1:**	determine ways to achieve product mix;
	PT-MAN14d.2:	relate the importance of product bundling to marketing products;
	PT-MAN14d.3:	develop a plan to create a product mix; and
	PT-MAN14d.4:	determine appropriate services to offer customers within a product mix.

Standard: **PT-MAN14e:**   The student will apply marketing factors to position
                                              products/services in a business so as to:

Components: **PT-MAN14e.1:** describe marketing factors that are used to position
                                              products/services in a business;

                             PT-MAN14e.2: use product branding to position products and services; and

                             PT-MAN14e.3: explain the role of customer service to positioning/image of
                                              products/services.

Strand: **PT-LOD1**	**Academics** Students apply English language arts, mathematics, science, and social studies content area skills.	
Standard:	**PT-LOD1a:**	The student will study and use basic academic skills to perform effectively in the workplace so as to:
Component:	**PT-LOD1a.1:**	apply mathematical, reading, and writing skills necessary to perform job tasks in the hospitality and tourism industry.
Standard:	**PT-LOD1b:**	The student will study the elements of marketing techniques used in various types of hospitality and tourism establishments to gain familiarity with all venues so as to:
Component:	**PT-LOD1b.1:**	achieve a familiarity with marketing techniques used in the hospitality and tourism industry to sell a product or service.
Standard:	**PT-LOD1c:**	The student will study and synthesize information from cultural diversity and geographical studies to appreciate their importance in developing product or service so as to:
Components:	**PT-LOD1c.1:**	identify the components of cultural diversity to understand their impact on the different areas of the hospitality and tourism industry; and
	PT-LOD1c.2:	identify the elements of geography that affect the hospitality and tourism industry to aid in customer service.
Standard:	**PT-LOD1d:**	The student will study and synthesize the effects of the economy on the hospitality and tourism industry to apply appropriate strategies in developing products and services so as to:
Component:	**PT-LOD1d.1:**	summarize how to use the "state of the economy" to plan products and services.
Strand: **PT-LOD2**	**Communication Skills** Students use information technology to express and interpret information.	
Standard:	**PT-LOD2a:**	The student will use good oral and written communication skills to create, express, and interpret information so as to:
Components:	**PT-LOD2a.1:**	apply active listening skills in obtaining and clarifying information; and
	PT-LOD2a.2:	respond with restatement and clarification techniques to clarify information.
Standard:	**PT-LOD2b:**	The student will interpret verbal and nonverbal behaviors to enhance communication with coworkers and customers/guests so as to:
Components:	**PT-LOD2b.1:**	interpret verbal behaviors to enhance communication with coworkers/guests; and
	PT-LOD2b.2:	interpret nonverbal behaviors to enhance communication.
Standard:	**PT-LOD2c:**	The student will use correct grammar, punctuation, and terminology to write and edit documents so as to:
Components:	**PT-LOD2c.1:**	compose writing clearly, succinctly, and accurately to reflect professionalism in written documents;

	PT-LOD2c.2:	use description of audience and purpose to prepare written documents including forms, reports, and data sheets;
	PT-LOD2c.3:	use correct grammar, spelling, punctuation, and capitalization to prepare written documents; and
	PT-LOD2c.4:	use computer skills to design and develop written materials and supporting visual aids.
Standard:	**PT-LOD2d:**	The student will use appropriate resources and techniques to develop and deliver formal and informal presentations so as to:
Components:	**PT-LOD2d.1:**	define purpose of presentation and prepare presentation(s) to support the purpose;
	PT-LOD2d.2:	prepare media and visual aids to support the intended purpose of the presentation; and
	PT-LOD2d.3:	define target audience for presentation and tailor presentation to meet specific needs/requirements of the target audience.
Standard:	**PT-LOD2e:**	The student will locate, organize, and reference written information from various sources to communicate with coworkers and clients/participants so as to:
Components:	**PT-LOD2e.1:**	locate written information based on specific needs;
	PT-LOD2e.2:	document the source of the information and cite the source when communicating the information; and
	PT-LOD2e.3:	communicate information to coworkers and/or clients as required.

Strand:
PT-LOD3

Problem Solving and Critical Thinking
Students use information technology to define, test, and solve problems.

Standard:	**PT-LOD3a:**	The student will use the principles of budgeting and forecasting to maximize profit and growth in various sectors of hospitality and tourism so as to:
Component:	**PT-LOD3a.1:**	apply forecasting skills to determine cost and profit.
Standard:	**PT-LOD3b:**	The student will study potential, real, and perceived emergency situations to recognize and implement appropriate safety and security measures so as to:
Components:	**PT-LOD3b.1:**	identify strategies for managing emergency situations; and
	PT-DCP3b.2:	determine budget and funding needs to support safety and security programs and staffing requirements.
Standard:	**PT-LOD3c:**	The student will identify and use common tasks that require employees to solve problems on the job so as to:
Components:	**PT-LOD3c.1:**	use critical thinking skills to solve problems;
	PT-LOD3c.2:	use comments and suggestions from the customer service area to formulate improvements in services/products and training of staff: and
	PT-LOD3c.3:	use customer comments to guide customer satisfaction policies.

Strand: **PT-LOD4**		**Information Technology Applications** Students use computers, networks, and communication technology to access, organize, process, transmit, and communicate information.
Standard:	**PT-LOD4a:**	The student will identify and use information technology tools specific to hospitality and tourism to access, manage, and integrate information so as to:
Components:	**PT-LOD4a.1:**	use computer-based technology to access information;
	PT-LOD4a.2:	use database and spreadsheet technology to manage information;
	PT-LOD4a.3:	use computer-based technology to integrate information;
	PT-LOD4a.4:	use information technology to evaluate information; and
	PT-LOD4a.5:	apply computer skills to expedite workflow and enhance customer service.
Strand: **PT-LOD5**		**Systems** Students use an organized set of ideas and principles to explain or interact among structured organizations.
Standard:	**PT-LOD5a:**	The student will understand roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment to identify the effect of systems on the quality of the product or service so as to:
Components:	**PT-LOD5a.1:**	research appropriate sources to trace the development of the hospitality and tourism industry and learn the overall structure; and
	PT-LOD5a.2:	use organizational charts to analyze the workplace operations.
Standard:	**PT-LOD5b:**	The student will manage and improve organizational systems to better serve customers so as to:
Components:	**PT-LOD5b.1:**	develop and manage plans and budgets to accomplish organizational goals and objectives; and
	PT-LOD5b.2:	develop plans to improve organizational performance including customer satisfaction and service/operations performance.
Standard:	**PT-LOD5c:**	The student will achieve a familiarity with other industries that have relevant services or products and understand how they impact a seamless product/service to the guest/customer so as to:
Components:	**PT-LOD5c.1:**	describe feasible collaboration with various other industries to provide inclusive product to the customer; and
	PT-LOD5c.2:	identify the core competencies of the various hospitality- and tourism-related organizations or businesses to best use available resources.
Strand: **PT-LOD6**		**Safety, Health, and Environment** Students understand the importance of safety, health, environmental, and regulatory compliance in the workplace.
Standard:	**PT-LOD6a:**	The student will study potential real and perceived hazards to recognize and implement appropriate safety and security measures so as to:

Components:	**PT-LOD6a.1:**	outline safety and security issues for individuals and groups in multiple environments to minimize risks; and
	PT-LOD6a.2:	practice personal safety while at the worksite and on work-related assignments to avoid injuries or accidents.
Standard:	**PT-LOD6b:**	The student will review all safety and sanitation procedures applicable to the work area to ensure a safe and healthy work environment for all individuals so as to:
Component:	**PT-LOD6b.1:**	examine sanitation procedures to ensure facility is in compliance with health codes.
Standard:	**PT-LOD6c:**	The student will research ways to use security measures to protect guests/customers/staff and limit liability so as to:
Component:	**PT-LOD6c.1:**	develop various security measures to increase safety.
Standard:	**PT-LOD6d:**	The student will study potential, real, and perceived hazards to recognize and implement appropriate safety and security measures so as to:
Component:	**PT-LOD6d.1:**	outline resources to use in various emergency situations for self, coworkers, and customers/guests.

Strand:
PT-LOD7   **Ethics and Legal Responsibilities**
Students understand the importance of ethical and legal guidelines in the workplace.

Standard:	**PT-LOD7a:**	The student will identify how ethical issues and concerns affect a career in the hospitality and tourism field so as to:
Component:	**PT-LOD7a.1:**	observe ethical behavior in the workplace to indicate the integral role it plays in all businesses.
Standard:	**PT-LOD7b:**	The student will examine and review ethical and legal responsibilities as they relate to guests/customers and employee conduct within the establishment to maintain high industry standards so as to:
Components:	**PT-LOD7b.1:**	develop an awareness of applicable legal policies to comply with laws regarding hiring, harassment, and safety issues; and
	PT-LOD7b.2:	interpret ethical and legal guidelines relating to job performance to solve legal and ethical issues.
Standard:	**PT-LOD7c:**	The student will show regard for ethics, values, and principles to deal fairly with others so as to:
Components:	**PT-LOD7c.1:**	respect others at all times to express personal ethical values; and
	PT-LOD7c.2:	integrate ethical treatment in the workplace to establish codes of conduct.
Standard:	**PT-LOD7d:**	The student will examine professional and workplace ethics and legal responsibilities to provide guidelines for conduct so as to:
Component:	**PT-LOD7d.1:**	demonstrate awareness of responsibilities for different positions within the organization.

Strand: **PT-LOD8**		**Employability and Career Development** Students use skills to plan career paths and pursue career opportunities.
Standard:	**PT-LOD8a:**	The student will research and review career options and qualifications to explore careers in the hospitality and tourism industry so as to:
Component:	**PT-LOD8a.1:**	examine the numerous career paths within hospitality and tourism to discover personal preferences.
Standard:	**PT-LOD8b:**	The student will review independently owned and chain-affiliated facilities in hospitality and tourism to compare and illustrate the advantages and disadvantages of working in each venue so as to:
Component:	**PT-LOD8b.1:**	examine an independently owned facility to distinguish it from other types.
Standard:	**PT-LOD8c:**	The student will learn steps necessary to seek, apply for, attain, and retain employment so as to:
Components:	**PT-LOD8c.1:**	seek and apply for employment to begin career objectives; and
	PT-LOD8c.2:	summarize steps necessary to retain a job in the industry.
Standard:	**PT-LOD8d:**	The student will understand advancement procedures and the promotional work ladder within the industry to plan career objectives so as to:
Component:	**PT-LOD8d.1:**	determine the chain of command for a particular industry to evaluate personal skills and potential; and
	PT-LOD8d.2:	explain skills required to achieve a promotion.
Strand: **PT-LOD9**		**Technical Skills** Students select and use technology tools to provide customer service.
Standard:	**PT-LOD9a:**	The student will examine the customer service skills required to be successful in the hospitality and tourism industry so as to:
Components:	**PT-LOD9a.1:**	examine the customer service skills required to be successful in the hospitality and tourism industry; and
	PT-LOD9a.2:	apply customer service skills to ensure guest satisfaction.
Standard:	**PT-LOD9b:**	The student will use different types of payment options to facilitate customer payments for services so as to:
Component:	**PT-LOD9b.1:**	handle different types of payments to accommodate the guest/customer.
Strand: **PT-LOD10**		**Leadership and Teamwork** Students collaborate with others to accomplish goals and objectives.
Standard:	**PT-LOD10a:**	The student will employ leadership and teamwork skills to facilitate workflow so as to:
Component:	**PT-LOD10a.1:**	examine the customer service skills required to be successful in the hospitality and tourism industry;
	PT-LOD10a.2:	observe outstanding leaders to identify effective management styles;
	PT-LOD10a.3:	lead others in tasks and activities to benefit the organization as a whole;

PT-LOD10a.4: use leadership skills to create motivation for change;

PT-LOD10a.5: model leadership and teamwork qualities to aid in employee morale;

PT-LOD10a.6: establish and maintain effective working relationships with all levels of personnel and other departments to provide effective services to guest/customer;

PT-LOD10a.7: use interpersonal skills to build effective working relationships;

PT-LOD10a.8: resolve conflicts to satisfy staff, guests/customers, and others; and

PT-LOD10a.9: use conflict-management skills to facilitate solutions.

Strand:
PT-RFB1

Ethics and Legal Responsibilities
Students understand the importance of ethical and legal guidelines in the workplace.

Standard:

PT-RFB1a: The student will examine and review ethical and legal responsibilities as they relate to guests, employees, and conduct within the establishment to maintain high industry standards so as to:

Components:

PT-RFB1a.1: examine all comments and suggestions from the customer service area to formulate improvements and ensure guests' satisfaction.

PT-RFB1a.2: achieve an awareness of applicable legal policies to comply with laws regarding hiring, harassment, and safety issues;

PT-RFB1a.3: interpret ethical and legal guidelines relating to job performance to solve legal or ethical issues;

PT-RFB1a.4: implement applicable legal guidelines and policies to comply with laws regarding hiring, harassment, job performance, ethical and safety issues;

PT-RFB1a.5: integrate guidelines for ethical treatment in the workplace; and

PT-RFB1a.6: identify how ethical issues and concerns affect a career field to aid in making career choices.

Strand:
PT-RFB2

Safety, Health, and Environment
Students understand the importance of safety, health, environmental, and regulatory compliance in the workplace.

Standard:

PT-RFB2a: The student will review all safety and sanitation procedures applicable to the work area to supervise staff in proper sanitation behaviors so as to:

Components:

PT-RFB2a.1: examine overall safety procedures to maintain a safe work area;

PT-RFB2a.2: examine sanitation procedures to ensure facility is in compliance with health codes; and

PT-RFB2a.3: examine the pursuit of personal lifestyle choices to prepare for careers in hospitality and tourism industry.

Standard:

PT-RFB2b: The student will analyze related chemicals and hazardous materials to prevent health-related problems that may result from exposure to these elements so as to:

Component:

PT-RFB2b.1: apply hazardous material practices and procedures for handling and disposing of chemicals.

Strand:
PT-RFB3

Systems
Students use an organized set of ideas and principles to explain or interact among structured organizations.

Standard:

PT-RFB3a: The student will examine the company's standard operating procedures to determine the criteria for food preparation so as to:

Components:

PT-RFB3a.1: implement a set of operating procedures to comply with company requirements;

	PT-RFB3a.2:	evaluate prepared foods for quality and presentation to set quality standards in accordance with company requirements;
	PT-RFB3a.3:	use basic food knowledge to prepare nutritious, quality foods;
	PT-RFB3a.4:	evaluate types of kitchen equipment to match equipment with correct cooking methods; and
	PT-RFB3a.5:	use points and various types of service to provide customer service in accordance with company policy.
Standard:	**PT-RFB3b:**	The student will understand roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment to identify the effect of systems on the quality of the product or service so as to:
Component:	**PT-RFB3b.1:**	use organizational charts to analyze the workplace operations.
Standard:	**PT-RFB3c:**	The student will manage and improve organizational systems to better serve customers so as to:
Components:	**PT-RFB3c.1:**	develop and manage plans and budgets to accomplish organizational goals and objectives: and
	PT-RFB3c.2:	develop plans to improve organizational performance including customer satisfaction and service/operations performance.
Standard:	**PT-RFB3d:**	The student will achieve a familiarity with other industries that have relevant services or products and understand how they impact a seamless delivery of products/services to the guest/customer so as to:
Component:	**PT-RFB3d.1:**	network with various other industries to best use available resources and provide an inclusive product to the customer.

Strand:
PT-RFB4   **Academics**
Students apply English language arts, mathematics, science, and social studies content area skills.

Standard:	**PT-RFB4a:**	The student will manage and use basic reading, writing, and mathematical skills for food service production and guest services to provide a positive guest experience so as to:
Component:	**PT-RFB4a.1:**	apply mathematical, reading, and writing skills to correctly deliver food products and guest services.
Standard:	**PT-RFB4b:**	The student will study and synthesize information from ethnic and geographical studies to apply to customer service so as to:
Component:	**PT-RFB4b.1:**	retrieve vital facts and statistics to correctly use information in a service environment.
Standard:	**PT-RFB4c:**	The student will study and use basic academic skills to perform effectively in the workplace so as to:
Component:	**PT-RFB4c.1:**	apply mathematical, reading, and writing skills necessary to perform job tasks in the hospitality and tourism industry.
Standard:	**PT-RFB4d:**	The student will study the elements of marketing techniques used in various types of hospitality and tourism establishments to gain familiarity with all venues so as to:
Component:	**PT-RFB4d.1:**	achieve a familiarity with marketing techniques used in the hospitality and tourism industry to sell a product or service.

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Standard:	**PT-RFB4e:**	The student will study and synthesize information from cultural diversity and geographical studies to appreciate their importance in developing products and services so as to:
Component:	**PT-RFB4e.1:**	identify the components of cultural diversity to understand their impact on the different areas of the hospitality and tourism industry.
Standard:	**PT-RFB4f:**	The student will study and synthesize the effects of the economy on the hospitality and tourism industry to apply appropriate strategies in developing products or services so as to:
Components:	**PT-RFB4f.1:**	summarize how to use the "state of the economy" to plan products and services; and
	PT-RFB4f.2:	examine management styles of different organizational structures to learn best practices for each style.
Standard:	**PT-RFB4g:**	The student will study the elements of management styles used in various types of hospitality and tourism establishments to gain familiarity with all venues so as to:
Component:	**PT-RFB4g.1:**	examine management styles of different organizational structures to learn best practices for each style.

Strand:
PT-RFB5

Communication Skills
Students use information technology to express and interpret information.

Standard:	**PT-RFB5a:**	The student will integrate listening, writing, and speaking skills to enhance operations and guest satisfaction so as to:
Components:	**PT-RFB5a.1:**	use verbal and nonverbal communications to provide a positive experience for guests and employees;
	PT-RFB5a.2:	recognize and respond to guests' needs and nonverbal cues to provide quality service; and
	PT-RFB5a.3:	interpret verbal and nonverbal behaviors to enhance communications with coworkers and customers/guests.
Standard:	**PT-RFB5b:**	The student will design all communications to exhibit professionalism in attitude, initiative, respect for others, and commitment so as to:
Components:	**PT-RFB5b.1:**	apply proper etiquette in all customer contacts; and
	PT-RFB5b.2:	interpret, transcribe, and communicate information, data, and observations to apply information learned from reading to actual practice.
Standard:	**PT-RFB5c:**	The student will locate, organize, and reference written information from various sources to communicate with coworkers and clients/participants so as to:
Component:	**PT-RFB5c.1:**	locate, organize, and document written information to communicate and network with coworkers.
Standard:	**PT-RFB5d:**	The student will use correct grammar, punctuation, and terminology to write and edit documents so as to:
Components:	**PT-RFB5d.1:**	compose multi-paragraph writing clearly, succinctly, and accurately to reflect professionalism in writing documents; and
	PT-RFB5d.2:	use computer skills to design and develop written materials and supporting visual aids.

Standard:	**PT-RFB5e:**	The student will use appropriate resources and techniques to develop and deliver formal and informal presentations so as to:
Components:	**PT-RFB5e.1:**	use description of audience and purpose to prepare oral presentation;
	PT-RFB5e.2:	identify and prepare media and visual aids to complement an oral presentation; and
	PT-RFB5e.3:	deliver presentation to sustain listener's attention and interest.
Standard:	**PT-RFB5f:**	The student will develop, interpret, and use tables, charts, and figures, to support written and oral communication so as to:
Component:	**PT-RFB5f.1:**	anticipate future needs to plan accordingly.
Standard:	**PT-RFB5g:**	The student will manage unexpected situations to ensure continuity of quality service so as to:
Component:	**PT-RFB5g.1:**	identify the problem and possible solutions, and decide on a course of action to resolve unexpected situations.

Strand:
PT-RFB6

Leadership and Teamwork
Students collaborate with others to accomplish goals and objectives.

Standard:	**PT-RFB6a:**	The student will review managerial skills required to make staffing decisions while following industry standards so as to:
Components:	**PT-RFB6a.1:**	model leadership and teamwork qualities to aid in employee retention and create a pleasant working atmosphere for staff members;
	PT-RFB6a.2:	formulate staff development plans to create an effective working team; and
	PT-RFB6a.3:	review industry standards in human relations policies and procedures to ensure all necessary information is included in orientation for new employees.
Standard:	**PT-RFB6b:**	The student will employ leadership and teamwork skills to facilitate workflow so as to:
Components:	**PT-RFB6b.1:**	develop group working relationships to improve the work environment; and
	PT-RFB6b.2:	observe outstanding leaders to identify effective management styles.
Standard:	**PT-RFB6c:**	The student will lead others in tasks and activities to benefit the organization as a whole so as to:
Components:	**PT-RFB6c.1:**	use leadership skills to create motivation for change; and
	PT-RFB6c.2:	model leadership and teamwork qualities to aid in employee morale.
Standard:	**PT-RFB6d:**	The student will resolve conflicts to satisfy staff, guest/customers, and others so as to:
Component:	**PT-RFB6d.1:**	use conflict-management skills to facilitate solutions.
Standard:	**PT-RFB6e:**	The student will establish and maintain effective working relationships with all levels of personnel and other departments to provide effective services to the guest/customer so as to:
Components:	**PT-RFB6e.1:**	use personal skills to build effective working relationships; and
	PT-RFB6e.2:	use conflict-management skills to facilitate solutions.

Strand: **PT-RFB7**		**Problem Solving and Critical Thinking** Students use information technology to define, test, and solve problems.
Standard:	**PT-RFB7a:**	The student will research costs, pricing, and market demands to manage profitability and implement effective marketing strategies so as to:
Components:	**PT-RFB7a.1:**	interpret calculations of food, labor, and pricing to ensure profitability;
	PT-RFB7a.2:	examine market and alternative ways of marketing to develop a promotional package; and
	PT-RFB7a.3:	anticipate future needs to plan accordingly.
Standard:	**PT-RFB7b:**	The student will manage unexpected situations to ensure continuity of quality service so as to:
Component:	**PT-RFB7b.1:**	identify the problem and possible solutions, and decide on a course of action to resolve unexpected situations.
Standard:	**PT-RFB7c:**	The student will use the principles of budgeting and forecasting to maximize profit and growth in various sectors of hospitality and tourism so as to:
Components:	**PT-RFB7c.1:**	apply forecasting skills to determine cost and profit; and
	PT-RFB7c.2:	apply budgeting skills to determine staffing levels.
Standard:	**PT-RFB7d:**	The student will examine all comments and suggestions from the customer service area to formulate improvements in services/products and training of staff so as to:
Component:	**PT-RFB7d.1:**	use customer comments to guide customer satisfaction policies.
Standard:	**PT-RFB7e:**	The student will study potential, real, and perceived emergency situations to recognize and implement appropriate safety and security measures so as to:
Component:	**PT-RFB7e.1:**	identify methods to cope with emergency situations.
Strand: **PT-RFB8**		**Information Technology Applications** Students use computers, networks, and communication technology to access, organize, process, transmit, and communicate information,
Standard:	**PT-RFB8a:**	The student will examine types of computerized systems used to manage food service operations and guest services so as to:
Components:	**PT-RFB8a.1:**	identify ways technology may be used to provide guest and food services;
	PT-RFB8a.2:	research and evaluate technical resources for food services and bar operations to update or enhance industry standards;
	PT-RFB8a.3:	use software applications to manage different aspects of food service operations;
	PT-RFB8a.4:	examine all comments and suggestions from the customer service area to formulate improvements and ensure guest satisfaction; and
	PT-RFB8a.5:	retrieve Web Site information to use in menu planning, recipes, and for product information.

Strand:
PT-RFB9   **Technical Skills**
Students select and use technology tools to provide customer service.

Standard:	**PT-RFB9a:**	The student will examine the company's standard operating procedures related to food and beverage production and guest service to measure effectiveness so as to:
Components:	**PT-RFB9a.1:**	implement set of operating procedures to comply with company requirements;
	PT-RFB9a.2:	evaluate prepared foods for quality and presentation to set quality standards in accordance with company requirements;
	PT-RFB9a.3:	use basic food knowledge to prepare nutritious, quality foods;
	PT-RFB9a.4:	evaluate types of kitchen equipment to match equipment with correct cooking methodology; and
	PT-RFB9a.5:	use appropriate types of food service to provide customer service according to set standards.
Standard:	**PT-RFB9b:**	The student will use different types of payment options to facilitate customer payments for service so as to:
Component:	**PT-RFB9b.1:**	handle different types of payments to accommodate the guest/customer.

Strand:
PT-RFB10   **Employability and Career Development**
Students use skills to plan career paths and pursue career opportunities.

Standard:	**PT-RFB10a:**	The student will research and review career options and qualifications in the restaurant and food service industry so as to:
Components:	**PT-RFB10a.1:**	summarize steps needed to obtain a job in the restaurant and food service industry;
	PT-RFB10a.2:	examine jobs available within the various types of restaurants and food service operations to assess career opportunities; and
	PT-RFB10a.3:	examine various industry sectors such as independent vs. chain operations to differentiate careers in each type of operation.
Standard:	**PT-RFB10b:**	The student will learn steps necessary to seek, apply for, obtain, and retain employment so as to:
Component:	**PT-RFB10b.1:**	seek and apply for employment to begin career objectives.

Strand:
PT-PCS1   **Academics**
Students apply English language arts, mathematics, science, and social studies content area skills.

Standard: **PT-PCS1a:**   The student will apply mathematics skills to provide services so as to:

Components: **PT-PCS1a.1:**   use addition, subtraction, multiplication, division, percentage, ratio and proportion, and geometric concepts to manage math-based information; and

                       PT-PCS1a.2:   use charts, tables, and graphs as resources for business decisions.

Standard: **PT-PCS1b:**   The student will apply principles of biology, identifying living tissues, cells, and organisms to provide/select safe and effective products and services so as to:

Components: **PT-PCS1b.1:**   identify and explain functions and interdependencies of tissues, cells, and organisms to provide/select safe and effective products and services; and

                       PT-PCS1b.2:   identify and explain interactions of tissues, cells, and organisms with each other and the environment to provide/select safe and effective products and services.

Standard: **PT-PCS1c:**   The student will interpret written sentences and paragraphs in work-related documents to obtain items of information so as to:

Component: **PT-PCS1c.1:**   use reading strategies to decode meaning, technical concepts, and vocabulary, and follow directions.

Standard: **PT-PCS1d:**   The student will apply principles of chemistry, explaining the composition, structure, and properties of substances and of chemical processes to provide broad-range services so as to:

Components: **PT-PCS1d.1**:   identify appropriate uses of chemicals;
                       PT-PCS1d.2:   understand chemical interactions; and
                       PT-PCS1d.3:   recognize potential problems of improper chemical use and the impact of these problems on clients.

Strand:
PT-PCS2   **Communication Skills**
Students use information technology to express and interpret information.

Standard: **PT-PCS2a:**   The student will select communication strategies to effectively serve personal care clients/family members so as to:

Components: **PT-PCS2a.1**:   use effective oral and written communication skills to address personal care clients/family members;
                       PT-PSC2a.2:   consult with individuals/family members to determine needs, preferences, and resources;
                       PT-PSC2a.3:   use interpersonal skills relating to client sensitivity, ethnic diversity, and building rapport to evaluate client point of view and interact respectfully; and
                       PT-PCS2a.4:   use verbal and nonverbal communication skills to establish and maintain positive relationships with coworkers, other professionals, and individuals/families.

Standard:	**PT-PCS2b:**	The student will apply advertising principles to attract and retain a large clientele so as to:
Component:	**PT-PCS2b.1:**	evaluate and use media to provide maximum impact on particular client populations.

Strand:
PT-PCS3

Problem Solving and Critical Thinking
Students use information technology to define, test, and solve problems.

Standard:	**PT-PCS3a:**	The student will assist individuals to recognize concerns and make informed decisions so as to:
Components:	**PT-PCS3a.1:**	use several approaches to identify and evaluate alternatives; and
	PT-PCS3a.2:	evaluate customer feedback to use it to best advantage.
Standard:	**PT-PCS3b:**	The student will facilitate the development of an individualized plan to reflect client/family preferences, needs, and interests so as to:
Component:	**PT-PCS3b.1:**	analyze client/family wishes, in conjunction with feasibility, to create a course of treatment/action.
Standard:	**PT-PCS3c:**	The student will use time management principles and techniques to achieve objectives so as to:
Component:	**PT-PCS3c.1:**	maintain a business/appointment schedule to effectively serve client/family/community.
Standard:	**PT-PCS3d:**	The student will use interpretation and evaluation skills to enhance client satisfaction so as to:
Components:	**PT-PCS3d.1:**	observe client/family to interpret client satisfaction with solutions, procedures, and products; and
	PT-PCS3d.2:	interpret technical information to choose best resource for use with client's/family's unique preferences.

Strand:
PT-PCS4

Information Technology Applications
Students use computers, networks, and communication technology to access, organize, process, transmit, and communicate information.

Standard:	**PT-PCS4a:**	The student will use technology to analyze data and information so as to:
Components:	**PT-PCS4a.1:**	summarize, compare, and contrast information to arrive at reliable conclusions;
	PT-PCS4a.2:	interpret information about a client, product, process, or topic needed to initiate action; and
	PT-PCS4a.3:	use appropriate software to represent existing client, product, service, or topic information in a different form.
Standard:	**PT-PCS4b:**	The student will keep electronic records of client services to access and safeguard crucial client information so as to:
Component:	**PT-PCS4b.1:**	comply with established procedures to store and retrieve information.

Strand: **PT-PCS5**	**Systems** Students use an organized set of ideas and principles to explain or interact among structured organizations.	
Standard:	**PT-PCS5a:**	The student will allocate resources to provide maximum benefit for the client, service provider, business, or organization so as to:
Component:	**PT-PCS5a.1:**	order and stock products/inventory from vendors to keep supplies available for offering timely client services and products.
Standard:	**PT-PCS5b:**	The student will examine the range of personal care resources to access at appropriate times so as to:
Components:	**PT-PCS5b.1:**	design, analyze, and obtain resources necessary for business practice.
Strand: **PT-PCS6**	**Safety, Health, and Environment** Students understand the importance of safety, health, environmental, and regulatory compliance in the workplace.	
Standard:	**PT-PCS6a:**	The student will practice emergency procedures and implement them as needed so as to:
Components:	**PT-PCS6a.1:**	follow policies, procedures, and regulations to achieve a safe and healthy work environment; and
	PT-PCS6a.2:	implement procedures to protect the health and safety of all.
Standard:	**PT-PCS6b:**	The student will recognize risks and potentially hazardous situations to help minimize workplace dangers so as to:
Components:	**PT-PCS6b.1:**	evaluate emergency situations to defuse them and determine intervention strategies; and
	PT-PCS6b.2:	use established guidelines, policies, and procedures to take appropriate measures (e.g., personal protective equipment, etc.)
Strand: **PT-PCS7**	**Leadership and Teamwork** Students collaborate with others to accomplish goals and objectives.	
Standard:	**PT-PCS7a:**	The student will set priorities to accomplish the mission of the personal care organization so as to:
Component:	**PT-PCS7a.1:**	establish and maintain effective working relationships with all levels of personnel to provide effective services to the client/family.
Standard:	**PT-PCS7b:**	The student will access appropriate material to establish a personal role in setting priorities for personal care organization so as to:
Component:	**PT-PCS7b.1:**	use organization's policies, procedures, and regulations to work with other coworkers in developing practices sensitive to cultural, religious, disability, and gender issues.
Standard:	**PT-PCS7c:**	The student will analyze the personal care environmental context and factors that may influence future direction so as to:
Component:	**PT-PCS7c.1:**	use conflict-management skills to facilitate solutions.
Standard:	**PT-PCS7d:**	The student will use leadership skills to maintain a positive relationship with the community so as to:

Components:	**PT-PCS7d.1:**	maintain a helpful profile in the professional community and in the larger community to enhance community life; and
	PT-PCS7d.2:	act as a community educator and advocate for the profession

Strand:
PT-PCS8

Employability and Career Development
Students use skills to plan career paths and pursue career opportunities.

Standard:	**PT-PCS8a:**	The student will continue professional development to keep current on relevant resources and information so as to:
Component:	**PT-PCS8a.1:**	use performance information to evaluate personal performance of goals and self-improvement issues.

Strand:
PT-PCS9

Technical Skills
Students select and use technology tools to provide customer service.

Standard:	**PT-PCS9a:**	The student will apply technical knowledge and skills required to function in personal care services so as to:
Component:	**PT-PCS9a.1:**	practice in chosen occupation to gain functional skills.
Standard:	**PT-PCS9b:**	The student will synthesize client and professional information to attract clientele and retain present clientele so as to:
Components:	**PT-PCS9b.1:**	assess current techniques and trends to determine applicability to business/organization; and
	PT-PCS9b.2:	assess client records to determine trends.
Standard:	**PT-PCS9c:**	The student will apply administrative/clerical procedures and systems to provide satisfaction for client so as to:
Component:	**PT-PCS9c.1:**	use software to create in-house documents and advertising materials; and
	PT-PCS9c.2:	use office/records management systems to keep client records current/accurate.
Standard:	**PT-PCS9d:**	The student will apply principles and processes for providing personal care services to satisfy the client's expectations so as to:
Components:	**PT-PCS9d.1:**	elicit and evaluate information to identify client's/family's needs; and
	PT-PCS9d.2:	provide services and products to conform to the highest quality standards possible.
Standard:	**PT-PCS9e:**	The student will use techniques, principles, tools, and instruments to develop efficient and safe delivery of client services so as to:
Components:	**PT-PCS9e.1:**	produce and use precise technical plans to develop delivery of client services; and
	PT-PCS9e.2:	create and use drawings and models to develop delivery of client services.
Standard:	**PT-PCS9f:**	The student will apply economic and accounting principles and practices to promote business success and growth so as to:
Components:	**PT-PCS9f.1:**	identify banking principles and evaluate banking institutions to determine where to establish a business account; and

	PT-PCS9f.2:	investigate how financial markets work to make successful investment choices.
Standard:	**PT-PCS9g:**	The student will apply principles of mechanics to choose, evaluate, and maintain service equipment so as to:
Component:	**PT-PCS9g.1:**	evaluate the design, use, and benefits of service to choose equipment.

Strand:
PT-ISS1   **Computer User Support**
Students analyze computer problems and provide customer support.

Standard: **PT-ISS1a:** The student will analyze technical support needed so as to:

Components: **PT-ISS1a.1:** apply information and data analysis techniques; and

        PT-ISS1a.2: evaluate present data and system configuration.

Standard: **PT-ISS1b:** The student will perform customer service so as to:

Components: **PT-ISS1b.1:** respond to user questions;

        PT-ISS1b.2: provide troubleshooting for hardware/software;

        PT-ISS1b.3: diagnose problems within system;

        PT-ISS1b.4: employ technical and computer tools to perform tasks in the most cost-effective manner; and

        PT-ISS1b.5: manage multiple customer requirements.

Strand:
PT-ISS2   **Management of Software Systems**
Students select, install, and maintain software based on need.

Standard: **PT-ISS2a:** The student will perform configuration management activities so as to:

Component: **PT-ISS2a.1:** determine standards to be applied (e.g., international, industry, military).

Standard: **PT-ISS2b:** The student will evaluate application software packages so as to:

Component: **PT-ISS2b.1:** evaluate appropriateness of software for specific projects.

Strand:
PT-ISS3   **Hardware Design, Operation, and Maintenance**
Students select, configure, and maintain hardware.

Standard: **PT-ISS3a:** The student will demonstrate knowledge of CPU components so as to:

Components: **PT-ISS3a.1:** demonstrate knowledge of chip configuration and structure;

        PT-ISS3a.2: demonstrate knowledge of the functions of internal components (e.g., motherboards, co-processor boards, memory devices); and

        PT-ISS3a.3: demonstrate knowledge of the characteristics and operation of controller and network interface cards.

Standard: **PT-ISS3b:** The student will install a computer system so as to:

Components: **PT-ISS3b.1**: identify primary PC components and the functions of each;

        PT-ISS3b.2: demonstrate knowledge of how hardware components interact and how conflicts arise;

        PT-ISS3b.3: access needed information using manufacturers' references (e.g., procedural manuals, documentation, standard and work flowcharts);

        PT-ISS3b.4: respond to error messages and symptoms of hardware failures;

        PT-ISS3b.5: install boards to support peripherals;

        PT-ISS3b.6: connect peripherals to CPU;

        PT-ISS3b.7: employ appropriate safety precautions when working with PCs;

        PT-ISS3b.8: configure system;

	PT-ISS3b.9:	verify system operation;
	PT-ISS3b.10:	document system installation activities;
	PT-ISS3b.11:	back up system configuration; and
	PT-ISS3b.12:	test all applications.
Standard:	**PT-ISS3c:**	The student will troubleshoot computer systems so as to:
Components:	**PT-ISS3c.1:**	identify priorities and interrupts at system level;
	PT-ISS3c.2:	demonstrate the use of volatile and nonvolatile memory;
	PT-ISS3c.3:	repair/replace volatile and nonvolatile memory;
	PT-ISS3c.4:	test system using diagnostic tools/software;
	PT-ISS3c.5:	identify problems in the operating system and related hardware;
	PT-ISS3c.6:	differentiate between hardware and software failure;
	PT-ISS3c.7:	update flash memory (BIOS);
	PT-ISS3c.8:	optimize hard drive;
	PT-ISS3c.9:	gather information on problem from user;
	PT-ISS3c.10:	conduct appropriate diagnostic tests;
	PT-ISS3c.11:	repair and replace hardware;
	PT-ISS3c.12:	reinstall software as needed;
	PT-ISS3c.13:	recover data and/or files; and
	PT-ISS3c.14:	restore system to normal operating standards.

Strand:
PT-ISS4   **Networking Concepts**
Students design computer networks.

Standard:	**PT-ISS4a:**	The student will demonstrate knowledge of basic network classifications and topologies so as to:
Components:	**PT-ISS4a.1:**	interpret basic networking terminology;
	PT-ISS4a.2:	differentiate between LANs, MANs, and WANs; and
	PT-ISS4a.3:	identify the basic broadcast topologies (e.g., star ring, bus).
Standard:	**PT-ISS4b:**	The student will demonstrate knowledge of network applications so as to:
Component:	**PT-ISS4b.1:**	demonstrate knowledge of how disk storage is shared across a network.

Strand:
PT-ISS5   **System Administration and Control**
Students maintain computer systems.

Standard:	**PT-ISS5a:**	The student will perform general system administration tasks so as to:
Component:	**PT-ISS5a.1:**	establish and maintain user accounts on multiple systems.

Strand:
PT-ISS6   **Project Management**
Students manage project tasks, timelines, and goals.

Standard:	**PT-ISS6a:**	The student will define scope of work to achieve individual and group goals so as to:
Components:	**PT-ISS6a.1:**	identify size and specifics of the task;
	PT-ISS6a.2:	formulate task sequence; and

	PT-ISS6a.3:	plan multiple tasks simultaneously.
Standard:	**PT-ISS6b:**	The student will manage information system project methodologies so as to:
Components:	**PT-ISS6b.1:**	define the scope of the project;
	PT-ISS6b.2:	develop initial project management flowchart;
	PT-ISS6b.3:	estimate time requirements;
	PT-ISS6b.4:	develop time and activity plan to achieve objective;
	PT-ISS6b.5:	coordinate plan with team, cross-functional groups, or individuals;
	PT-ISS6b.6:	manage the change control process; and
	PT-ISS6b.7:	participate in project phase review.
Standard:	**PT-ISS6c:**	The student will apply knowledge of the life cycle of an information system so as to:
Components:	**PT-ISS6c.1:**	define scope of work to achieve individual and group goals;
	PT-ISS6c.2:	develop time and activity plan to achieve objective;
	PT-ISS6c.3:	evaluate technical writing requirements;
	PT-ISS6c.4:	conduct technical research;
	PT-ISS6c.5:	design technical documentation; and
	PT-ISS6c.6:	write technical reports.
Standard:	**PT-ISS6d:**	The student will develop time and activity plans to achieve objective so as to:
Component:	**PT-ISS6d.1:**	formulate a task strategy.

Strand:
PT-ISS7

Technical Writing and Documentation
Students use technology to write and publish technical specifications and directions.

Standard:	**PT-ISS7a:**	The student will evaluate technical writing requirements so as to:
Components:	**PT-ISS7a.1:**	evaluate technical writing requirements; and
	PT-ISS7a.2:	evaluate strengths and weaknesses of completed project.
Standard:	**PT-ISS7b:**	The student will conduct technical research so as to:
Components:	**PT-ISS7b.1:**	identify target audience;
	PT-ISS7b.2:	define research questions;
	PT-ISS7b.3:	identify potential sources of information;
	PT-ISS7b.4:	evaluate potential sources of information based on established criteria (e.g., affordability, relevance);
	PT-ISS7b.5:	conduct interviews with selected human information sources;
	PT-ISS7b.6:	gather information from selected print and electronic sources; and
	PT-ISS7b.7:	determine the accuracy and completeness of the information gathered.
Standard:	**PT-ISS7c:**	The student will write technical reports so as to:
Components:	**PT-ISS7c.1**:	analyze data;
	PT-ISS7c.2:	plan information flow; and
	PT-ISS7c.3:	design technical documentation.

Strand:
PT-ISS8

Quality Assurance Processes
Students use a systematic approach to provide evidence that products satisfy requirements.

Standard: **PT-ISS8a:**   The student will employ quality tools so as to:

Component: **PT-ISS8a.1:**   select quality tool(s) appropriate to situation.

Standard: **PT-ISS8b:**   The student will apply knowledge of quality cost implications so as to:

Component: **PT-ISS8b.1:**   identify safety responsibility within organization.

Strand:
PT-ISS9

Academics
Students apply English language arts, mathematics, science, and social studies content area skills.

Standard: **PT-ISS9a:**   The student will demonstrate language arts knowledge and skills required to pursue the full range of career and postsecondary education opportunities within the IT career cluster so as to:

Components: **PT-ISS9a.1:**   adapt language (diction, structure, style) for audience, purpose, and situation;

PT-ISS9a.2:   collect and organize oral and written information;

PT-ISS9a.3:   compose and edit (agenda, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, technical terminology);

PT-ISS9a.4:   comprehend oral and written information (cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, technical matter);

PT-ISS9a.5:   evaluate oral and written information (accuracy, adequacy, appropriateness, clarity, conclusions, solutions, fact/opinion, propaganda, relevancy, validity, relationship of ideas);

PT-ISS9a.6:   present formal and informal speech, discussion, information requests/supplying, interpretation, persuasion; and

PT-ISS9a.7:   use library, text, and Internet resources.

Strand:
PT-ISS10

Communication Skills
Students use information technology to express and interpret information.

Standard: **PT-ISS10a:**   The student will locate, organize, and reference written information from various sources to communicate with coworkers and clients/participants so as to:

Components: **PT-ISS10a.1:**   locate written information to communicate with students and teachers;

PT-ISS10a.2:   organize information to use in written and oral communications;

PT-ISS10a.3:   document the source and proper reference for written information;

PT-ISS10a.4:   use computer skills to design and develop written and supporting material;

PT-ISS10a.5:   prepare oral presentation to provide information for intended purpose and audience;

	PT-ISS10a.6:	identify and prepare support materials to accompany oral presentation; and
	PT-ISS10a.7:	deliver presentations to sustain listener's attention and interest.
Standard:	**PT-ISS10b**:	The student will apply active listening skills to obtain and clarify information so as to:
Component:	**PT-ISS10b.1:**	respond with restatement and clarification techniques to clarify information.
Standard:	**PT-ISS10c:**	The student will demonstrate sensitivity in communicating with a diverse workforce so as to:
Component:	**PT-ISS10c.1:**	understand factors and strategies for communicating with a diverse workforce.
Standard:	**PT-ISS10d:**	The student will build customer relations so as to:
Components:	**PT-ISS10d.1:**	demonstrate ability to assist customers in a professional manner;
	PT-ISS10d.2:	ensure that customers' needs are met and that customer base is maintained; and
	PT-ISS10d.3:	document interaction with customers.

Strand: **PT-ISS11**	**Problem Solving and Critical Thinking** Students use information technology to define, test, and solve problems.	
Standard:	**PT-ISS11a:**	The student will guide progress in assigned areas of responsibility/accountability so as to:
Components:	**PT-ISS11a.1:**	set goals;
	PT-ISS11a.2:	monitor and adjust goals; and
	PT-ISS11a.3:	communicate and recognize goal achievement.
Standard:	**PT-ISS11b:**	The student will conduct technical research so as to:
Components:	**PT-ISS11b.1:**	determine audience and information needs; and
	PT-ISS11b.2:	gather and evaluate information.
Standard:	**PT-ISS11c:**	The student will produce a quality product/service so as to:
Components:	**PT-ISS11c.1:**	understand product/service design; and
	PT-ISS11c.2:	test and maintain products/services.
Standard:	**PT-ISS11d:**	The student will use Internet applications so as to:
Components:	**PT-ISS11d.1:**	search for information and resources; and
	PT-ISS11d.2:	access and evaluate Internet resources.
Standard:	**PT-ISS11e:**	The student will use writing/publishing/presentation applications so as to:
Components:	**PT-ISS11e.1:**	prepare reports and other business communications, integrating graphics and other nontext elements;
	PT-ISS11e.2:	prepare presentations for training, sales, and information sharing; and
	PT-ISS11e.3:	deliver presentations, with supporting materials.

Strand:
PT-ISS12   **Leadership and Teamwork**
                                 Students collaborate with others to accomplish goals and objectives.

Standard: **PT-ISS12a:**   The student will demonstrate knowledge of the skills needed for
                                      leadership in the IT environment so as to:

Components: **PTI-SS12a.1:**   understand key approaches to successful leadership in the IT
                                      environment;

                   PT-ISS12a.2:   build interpersonal skills with individuals and other team
                                      members; and

                   PT-ISS12a.3:   apply best practices for successful team functioning.

Strand:
PT-ISS13   **Interactive Media Customer Requirements**
                                 Students identify client needs and product expectations.

Standard: **PT-ISS13a:**   The student will gather and analyze interactive media customer
                                      requirements so as to:

Component: **PT-ISS13a.1:**   gather data to identify customer requirements.

Standard: **PT-ISS13b:**   The student will create interactive media product specifications
                                      so as to:

Components: **PT-ISS13b.1:**   prepare functional specifications; and

                   PT-ISS13b.2:   prepare visual design specifications.

Strand:
PT-ISS14   **Safety**
                                 Students understand the importance of safety in the workplace.

Standard: **PT-ISS14a:**   The student will apply safety practices in the laboratory so as to:

Components: **PT-ISS14a.1:**   develop and implement a safety checklist;

                   PT-ISS14a.2:   use safety equipment in the laboratory; and

                   PT-ISS14a.3:   encourage others to employ safety practices.

Strand:
PT-ISS15   **History of Electricity and Electronics**
                                 Students understand the foundations of electricity and electronics.

Standard: **PT-ISS15a:**   The student will examine the historical developments in
                                      electricity and electronics so as to:

Components: **PT-ISS15a.1:**   define innovation and invention related to electronics;

                   PT-ISS15a.2:   research history of invention in electronics; and

                   PT-ISS15a.3:   make a presentation based upon historical research.

Strand:
PT-ISS16   **Mathematics for Electronics**
                                 Students apply mathematical concepts to the study of electronics.

Standard: **PT-ISS16a:**   The student will apply the mathematical processes and
                                      applications that lead to solutions of electronic problems so as
                                      to:

Components: **PT-ISS16a.1:**   solve direct current (DC) circuit analysis problems using Ohm's
                                      Law;

                   PT-ISS16a.2:   calculate fundamental alternating current (AC) parameters;

                   PT-ISS16a.3:   manipulate scientific notation in problem solutions;

	PT-ISS16a.4:	manipulate engineering notation in problem solutions and used in unit conversion;
	PT-ISS16a.5:	derive algebraic equations to determine unknown values in circuits;
	PT-ISS16a.6:	use Boolean algebra for design and analysis of digital circuits;
	PT-ISS16a.7:	use a scientific calculator as a tool for problem solving; and
	PT-ISS16a.8:	convert units of measurement from one system to another.

Strand:
PT-ISS17   **Testing Digital Circuits**
Students conduct electronic tests.

Standard:	**PT-ISS17a:**	The student will demonstrate the use of appropriate diagnostic equipment so as to:
Components:	**PT-ISS17a.1:**	select and apply appropriate test equipment or tools; and
	PT-ISS17a.2:	analyze and apply observed logic states.

Strand:
PT-ISS18   **Digital Applications**
Students understand digital electronics.

Standard:	**PT-ISS18a:**	The student will apply concepts of digital electronics so as to:
Components:	**PT-ISS18a.1:**	draw and label the seven basic logic gates;
	PT-ISS18a.2:	derive the truth tables of the seven basic logic gates; and
	PT-ISS18a.3:	construct logic circuits using discrete components to emulate the seven basic gates.
Standard:	**PT-ISS18b:**	The student will investigate the operation of logic circuits and how logic gates are used to perform digital operations so as to:
Components:	**PT-ISS18b.1:**	investigate integrated circuits, electronic logic circuits, clocks, timers and flip-flops, digital counting circuits, advanced timers, and computer circuits; and
	PT-ISS18b.2:	assemble a digital trainer.

Strand:
PT-ITM1   **Interactive Media Customer Requirements**
Students identify client needs and product expectations.

Standard: **PT-ITM1a:**   The student will gather data to identify customer requirements so as to:

Component: **PT-ITM1a.1:**   determine client's needs and expected outcomes.

Standard: **PT-ITM1b:**   The student will interpret and evaluate customer requirements so as to:

Components: **PT-ITM1b.1:**   determine purpose of the interactive media product;
             PT-ITM1b.2:   determine the target audience; and
             PT-ITM1b.3:   determine the interactive media elements to be used.

Strand:
PT-ITM2   **Interactive Media Product Specifications**
Students derive product specifications based on client needs and expectations.

Standard: **PT-ITM2a:**   The student will prepare functional specifications for interactive media product so as to:

Components: **PT-ITM2a.1:**   develop flowchart and/or navigational blueprints;
             PT-ITM2a.2:   determine delivery platform;
             PT-ITM2a.3:   design user interface; and
             PT-ITM2a.4:   design navigational schematic.

Standard: **PT-ITM2b:**   The student will create final project plan so as to:

Components: **PT-ITM2b.1:**   identify and obtain tools and resources to do the job;
             PT-ITM2b.2:   identify and evaluate risks;
             PT-ITM2b.3:   develop detailed task list;
             PT-ITM2b.4:   identify critical milestones; and
             PT-ITM2b.5:   identify interdependencies.

Strand:
PT-ITM3   **Tools for Media Production, Development, and Project Management**
Students select technology tools based on client requirements and product specifications.

Standard: **PT-ITM3a:**   The student will select and use appropriate software tools so as to:

Components: **PT-ITM3a.1:**   demonstrate proficiency in the use of digital-imaging techniques and equipment;
             PT-ITM3a.2:   synthesize available interactive media technologies into a unified presentation using appropriate authoring software;
             PT-ITM3a.3:   demonstrate knowledge of available graphics software programs;
             PT-ITM3a.4:   manipulate images; and
             PT-ITM3a.5:   demonstrate knowledge of the basic principles of animation.

Strand:
PT-ITM4   **Web Programming and Hosting**
                                     Students learn Web site management including programming, bandwidth issues,
                                     client/server management, and Web site hosting.

Standard: **PT-ITM4a:**   The student will demonstrate knowledge of Internet programming
                                     basics so as to:

Components: **PT-ITM4a.1:** recognize the importance of Internet programming standards;

                     PT-ITM4a.2: demonstrate knowledge of standard Internet programming
                                     coding;

                     PT-ITM4a.3: differentiate between various versions of Internet programming;

                     PT-ITM4a.4: demonstrate knowledge of how to use standard programs to
                                     produce an Internet application;

                     PT-ITM4a.5: identify authoring programs specifically designed for Internet
                                     programming production;

                     PT-ITM4a.6: compare/contrast features, strengths, and weaknesses of
                                     different authoring programs;

                     PT-ITM4a.7: identify cross-platform issues; and

                     PT-ITM4a.8: keep up-to-date with new and emerging trends related to Internet
                                     programming.

Standard: **PT-ITM4b:**   The student will understand the differences between a client and
                                     a server so as to:

Component: **PT-ITM4b.1:** differentiate between a client and a server.

Standard: **PT-ITM4c:**   The student will understand how bandwidth affects data
                                     transmission and onscreen image so as to:

Component: **PT-ITM4c.1**: demonstrate knowledge of how bandwidth affects data
                                     transmission and on-screen image.

Standard: **PT-ITM4d:**   explain the differences in hosting a Web site on a local server
                                     versus at an ISP (Internet Service Provider) so as to:

Component: **PT-ITM4d.1:** compare the advantages and disadvantages of running your own
                                     server versus using a server provider.

Standard: **PT-ITM4e:**   The student will apply knowledge of basic Web programming so
                                     as to:

Components: **PT-ITM4e.1:** demonstrate knowledge of how to interface client/server;

                     PT-ITM4e.2: identify standard scripting languages (e.g., JavaScript, VBScript);
                                     and

                     PT-ITM4e.3: demonstrate knowledge of the uses and
                                     advantages/disadvantages of various scripting languages.

Standard: **PT-ITM4f:**   The student will explain features and functions of Web-browsing
                                     software so as to:

Components: **PT-ITM4f.1:** demonstrate knowledge of the role of browsers in reading files
                                     on the World Wide Web

                     PT-ITM4f.2   identify how different browsers and browser settings affect the
                                     look of a Web page; and

                     PT-ITM4f.3: demonstrate knowledge of the characteristics and use of plug-
                                     ins.

Strand:
PT-ITM5

Creation and Implementation of Interactive Media Products
Students use functional specifications to create interactive media products.

Standard: **PT-ITM5a:** The student will implement functional design criteria so as to:

Components: **PT-ITM5a.1:** identify, use, and create reusable components;

PT-ITM5a.2: create and produce content; and

PT-ITM5a.3: create and refine design concepts.

Standard: **PT-ITM5b:** The student will create product visual design so as to:

Components: **PT-ITM5b.1:** apply principles and elements of design;

PT-ITM5b.2: apply color theory to select appropriate colors;

PT-ITM5b.3: create and/or implement the look and feel of the product;

PT-ITM5b.4: create graphical images;

PT-ITM5b.5: apply knowledge of typography;

PT-ITM5b.6: alter digitized images using an image manipulation program; and

PT-ITM5b.7: evaluate visual appeal.

Standard: **PT-ITM5c:** The student will produce or acquire content so as to:

Components: **PT-ITM5c.1:** produce or acquire graphics content;

PT-ITM5c.2: produce or acquire animation content;

PT-ITM5c.3: produce or acquire audio content; and

PT-ITM5c.4: produce or acquire video content.

Standard: **PT-ITM5d:** The student will integrate media elements so as to:

Components: **PT-ITM5d.1:** integrate the use of photographic special effects into media presentations; and

PT-ITM5d.2: integrate photographically derived images with hand-drawn graphic images.

Strand:
PT-ITM6

Testing of Interactive Media Product
Students systematically test the product and make product revisions based on test results.

Standard: **PT-ITM6a:** The student will develop and implement a test plan so as to:

Components: **PT-ITM6a.1:** perform usability tests;

PT-ITM6a.2: assess product effectiveness;

PT-ITM6a.3: test product for reliability; and

PT-ITM6a.4: revise product design based on test results.

Strand:
PT-ITM7

Use of Writing/Publishing Applications
Students collaborate with others to accomplish goals and objectives.

Standard: **PT-ITM7a:** The student will use technology to create and publish information so as to:

Components: **PT-ITM7a.1:** create documents (e.g., letters, memos, reports) both with and without templates;

PT-ITM7a.2: format text using basic formatting functions (e.g., paragraph spacing, margins, bullets, numbering); and

PT-ITM7a.3: employ word-processing utility tools (e.g., track changes, thesaurus).

Standard:	**PT-ITM7b:**	The student will prepare complex publications so as to:
Components:	**PT-ITM7b.1:**	create new word-processing forms, style sheets, and templates;
	PT-ITM7b.2:	prepare publications using desktop-publishing software;
	PT-ITM7b.3:	format new desktop-publishing files;
	PT-ITM7b.4:	organize content and standardize format from various sources;
	PT-ITM7b.5:	output desktop-publishing files; and
	PT-ITM7b.6:	create nonprint output for publication (e.g., PDF, postscript).
Standard:	**PT-ITM7c:**	The student will prepare reports and other business communications, integrating graphics and other nontext elements so as to:
Components:	**PT-ITM7c.1:**	use advanced formatting features (e.g., headers/footers/dropped caps, indexing);
	PT-ITM7c.2:	place graphics in a document; and
	PT-ITM7c.3:	enhance publications using different fonts, styles, attributes, justification, etc.

Strand:
PT-ITM8

Grammar, Punctuation, and Terminology
Students apply mechanics of writing.

Standard:	**PT-ITM8a:**	The student will use description of audience and purpose to prepare written documents so as to:
Components:	**PT-ITM8a.1:**	use technical terms and concepts;
	PT-ITM8a.2:	incorporate and use references effectively and accurately; and
	PT-ITM8a.3:	report objective and/or subjective information.
Standard:	**PT-ITM8b:**	The student will use computer skills to design and develop written and supporting material so as to:
Component:	**PT-ITM8b.1:**	format written documents with correct font and layout for easy reading.

Strand:
PT-ITM9

Applications in Computer Graphics
Students use technology to create computer graphics.

Standard:	**PT-ITM9a:**	The student will analyze multimedia applications of software/hardware for the purposes of visual communications so as to:
Components:	**PT-ITM9a.1:**	exhibit knowledge of graphic design and related software;
	PT-ITM9a.2:	create examples of computer graphics in commercial applications; and
	PT-ITM9a.3:	export animations as animated files.

Strand:
PT-ITM10

Leadership and Teamwork
Students collaborate with others to accomplish goals and objectives.

Standard:	**PT-ITM10a:**	The student will produce interactive media as member of a development team so as to:
Components:	**PT-ITM10a.1:**	implement functional design criteria;
	PT-ITM10a.2:	create product visual design;
	PT-ITM10a.3:	produce or acquire content; and

PT-ITM10a.3: participate in iterative development with clients and team members.

Strand:
PT-PSD1   **Programming and Software Engineering**
                                    Students will use software to design solutions for customer needs.

Standard: **PT-PSD1a:**   The student will identify and analyze customer software needs
                                    and requirements so as to:

Components: **PT-PSD1a.1:** gather data to identify customer requirements;

                   PT-PSD1a.2: conduct needs analysis;

                   PT-PSD1a.3: develop software requirements specification;

                   PT-PSD1a.4: analyze requirements/specifications using current approaches;
                                    and

                   PT-PSD1a.5: use available reference tools as appropriate.

Standard: **PT-PSD1b:**   The student will produce IT-based strategies and project plan to
                                    solve the specific problem so as to:

Components: **PT-PSD1b.1:** define scope of work for the programming project;

                   PT-PSD1b.2: demonstrate knowledge and skills of working on a software
                                    development team; and

                   PT-PSD1b.3: design project plan.

Standard: **PT-PSD1c:**   The student will define and analyze system and software
                                    requirements so as to:

Component: **PT-PSD1c.1:** understand elements and types of information processing.

Standard: **PT-PSD1d:**   The student will demonstrate the effective use of tools for
                                    software development so as to:

Components: **PT-PSD1d.1:** apply tools for developing software applications; and

                   PT-PSD1d.2: apply language-specific programming tools/techniques.

Standard: **PT-PSD1e:**   The student will demonstrate knowledge of the software
                                    development process so as to:

Component: **PT-PSD1e.1:** demonstrate knowledge of software development methodology.

Standard: **PT-PSD1f:**   The student will design a software application so as to:

Components: **PT-PSD1f.1:** create design specification for a computer application;

                   PT-PSD1f.2: demonstrate comprehension of the trade-off involved in design
                                    choices;

                   PT-PSD1f.3: demonstrate knowledge of computing/networking hardware and
                                    software architecture; and

                   PT-PSD1f.4: apply the principles of effective information management,
                                    information organization, and information retrieval skills.

Standard: **PT-PSD1g:**   The student will produce (i.e., code) a computer application so
                                    as to:

Components: **PT-PSD1g.1:** demonstrate knowledge of programming language concepts;

                   PT-PSD1g.2: demonstrate proficiency in developing an application using an
                                    appropriate programming language;

                   PT-PSD1g.3: understand the range of languages used in software
                                    development;

                   PT-PSD1g.4: demonstrate knowledge of program development methodology;

	PT-PSD1g.5:	demonstrate knowledge of basic implementation of software systems;
	PT-PSD1g.6:	develop software requirements/specifications; and
	PT-PSD1g.7:	resolve problems with integration if they occur.
Standard:	**PT-PSD1h:**	The student will demonstrate knowledge of software testing so as to:
Components:	**PT-PSD1h.1:**	develop test plan;
	PT-PSD1h.2:	perform testing and validation;
	PT-PSD1h.3:	document test results; and
	PT-PSD1h.4:	develop software testing audit trails.
Standard:	**PT-PSD1i:**	The student will perform maintenance and customer support functions so as to:
Components:	**PT-PSD1i.1:**	analyze technical support needs for software;
	PT-PSD1i.2:	perform customer service; and
	PT-PSD1i.3:	perform software maintenance activities.

Strand:
PT-NWS1   **Identifying and Analyzing Customer/Organization Network System Needs and Requirements**
Students analyze needs and requirements.

Standard: **PT-NWS1a:**   The student will gather data to identify customer/organization requirements so as to:

Components: **PT-NWS1a.1:**   identify system and network requirements;

PT-NWS1a.2:   identify physical requirements for system implementation;

PT-NWS1a.3:   identify system requirements for various types of installations;

PT-NWS1a.4:   identify environmental requirements, conditions, and limitations;

PT-NWS1a.5:   identify input and output requirements;

PT-NWS1a.6:   identify system processing requirements;

PT-NWS1a.7:   identify functional requirements for hardware, networking, and software system; and

PT-NWS1a.8:   identify time, technology, and resource constraints.

Standard: **PT-NWS1b:**   The student will conduct needs analysis so as to:

Components: **PT-NWS1b.1:**   analyze existing procedures;

PT-NWS1b.2:   define business problem to be solved by the application; and

PT-NWS1b.3:   access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, and work flowcharts).

Standard: **PT-NWS1c:**   The student will develop networking requirements specification so as to:

Components: **PT-NWS1c.1:**   demonstrate knowledge of the use, structure, and contents of a requirements specification document;

PT-NWS1c.2:   define system and software requirements;

PT-NWS1c.3:   evaluate installation requirements;

PT-NWS1c.4:   resolve conflicting requirements; and

PT-NWS1c.5:   develop informal specifications.

Standard: **PT-NWS1d:**   The student will analyze requirements/specifications using current approaches so as to:

Components: **PT-NWS1d.1:**   demonstrate knowledge of how to use software methodologies to analyze a real-world problem; and

PT-NWS1d.2:   identify constraints.

Strand:
PT-NWS2   **Project Management**
Students manage project tasks, timelines, and goals.

Standard: **PT-NWS2a:**   The student will produce strategies and plan to solve the specific network problem so as to:

Components: **PT-NWS2a.1:**   evaluate project requirements;

PT-NWS2a.2:   demonstrate knowledge of the key functions and subsystems of the network system; and

PT-NWS2a.3:   demonstrate knowledge of the system life-cycle approach.

Standard: **PT-NWS2b:**   The student will create project plan so as to:

Components:	**PT-NWS2b.1:**	prepare overall plan for integrating new processes, protocols, and equipment;
	PT-NWS2b.2:	estimate time requirements;
	PT-NWS2b.3:	identify tools and resources for the job;
	PT-NWS2b.4:	identify and evaluate risks;
	PT-NWS2b.5:	identify critical milestones; and
	PT-NWS2b.6:	identify interdependencies.
Standard:	**PT-NWS2c:**	The student will manage information system project methodologies so as to:
Components:	**PT-NWS2c.1:**	define the scope of the project;
	PT-NWS2c.2:	develop task list (i.e., work breakdown structures);
	PT-NWS2c.3:	evaluate project requirements and risks;
	PT-NWS2c.4:	identify stakeholders and decision makers;
	PT-NWS2c.5:	identify required resources and budgets;
	PT-NWS2c.6:	identify and track critical milestones; and
	PT-NWS2c.7:	develop a method of evaluation.

Strand:
PT-NWS3

Quality Assurance Processes
Students use a systematic approach to provide evidence that products satisfy requirements.

Standard:	**PT-NWS3a:**	The student will evaluate the correctness and effectiveness of implementing the network system so as to:
Components:	**PT-NWS3a.1:**	evaluate whether the process was applied in an efficient and responsible manner; and
	PT-NWS3a.2:	determine needed follow-up actions.
Standard:	**PT-NWS3b**:	The student will analyze network security systems so as to:
Components:	**PT-NWS3b.1:**	identify security requirements and the need for data protection;
	PT-NWS3b.2:	identify specific access levels that need to be accommodated;
	PT-NWS3b.3:	match security system design to identified security requirements; and
	PT-NWS3b.4:	develop security plan.

Strand:
PT-NWS4

Networking Concepts Processes
Students design computer networks.

Standard:	**PT-NWS4a:**	The student will demonstrate knowledge of the basics of network architecture so as to:
Components:	**PT-NWS4a.1:**	demonstrate knowledge of the characteristics and uses of network components (e.g., hub, switches, routers, firewall);
	PT-NWS4a.2:	differentiate between a physical and logical topology;
	PT-NWS4a.3:	demonstrate a basic knowledge of OSI modeling;
	PT-NWS4a.4:	demonstrate knowledge of LAN transmission methods and standards;
	PT-NWS4a.5:	demonstrate knowledge of LAN transmission protocols;
	PT-NWS4a.6:	demonstrate knowledge of various frame types and formats; and
	PT-NWS4a.7:	differentiate processes, services, and protocol.

Standard:	**PT-NWS4b:**	The student will demonstrate knowledge of basic network classifications and topologies so as to:
Components:	**PT-NWS4b.1:**	differentiate between LANs, MANs, and WANs;
	PT-NWS4b.2:	identify the basic point-to-point network topologies (e.g., star, ring, tree, network, and irregular);
	PT-NWS4b.3:	demonstrate knowledge of packet-switching techniques;
	PT-NWS4b.4:	identify basic broadcast topologies (e.g., star, ring, bus);
	PT-NWS4b.5:	demonstrate knowledge of characteristics of connection-oriented and connectionless networks;
	PT-NWS4b.6:	demonstrate knowledge of basic telephony (analog vs. digital signals);
	PT-NWS4b.7:	demonstrate knowledge of how to turn LANs into MANs and WANs;
	PT-NWS4b.8:	identify standard high-speed networks;
	PT-NWS4b.9:	demonstrate knowledge/usage of electronic communication networks; and
	PT-NWS4b.10:	investigate emerging technologies.
Standard:	**PT-NWS4c**:	The student will demonstrate knowledge of LAN physical media so as to:
Components:	**PT-NWS4c.1:**	demonstrate knowledge of the reasons for installing a network;
	PT-NWS4c.2:	demonstrate knowledge of local area network (LAN) trends and issues;
	PT-NWS4c.3:	trace the evolution of networks; and
	PT-NWS4c.4:	analyze current trends and development in LANs.
Standard:	**PT-NWS4d:**	The student will demonstrate knowledge of common network computing platforms so as to:
Components:	**PT-NWS4d.1:**	identify how components of a network operating system (server, platform, network services software, network redirection software, communications software) support network operations; and
	PT-NWS4d.2:	select a LAN/WAN technology that meets user-defined set of requirements.
Standard:	**PT-NWS4e:**	The student will demonstrate knowledge of network connectivity basis and transmission line applications so as to:
Components:	**PT-NWS4e.1:**	demonstrate knowledge of the principles and operation of wire (coaxial, fiber optics, etc.) and wireless systems; and
	PT-NWS4e.2:	demonstrate knowledge of the principles and operation of fiber optics, analog and digital circuits.
Standard:	**PT-NWS4f:**	The student will demonstrate knowledge of communication standards for networks so as to:
Components:	**PT-NWS4f.1:**	demonstrate knowledge of the TCP/IP protocol;
	PT-NWS4f.2:	demonstrate knowledge of open-system interconnection (OSI) standard and ISO standard 7498; and
	PT-NWS4f.3:	identify standard high-speed networks.
Standard:	**PT-NWS4g:**	The student will demonstrate knowledge of network operating systems so as to:

Component:	**PT-NWS4g.1:**	demonstrate knowledge of the general characteristics of network operating systems.
Standard:	**PT-NWS4h:**	The student will demonstrate knowledge of WAN systems so as to:
Components:	**PT-NWS4h.1:**	demonstrate knowledge of the conversion of analog speech to digital;
	PT-NWS4h.2:	relate voice, data concepts, and video-to-video area networks;
	PT-NWS4h.3:	select primary and backup data circuits;
	PT-NWS4h.4:	evaluate analog and digital transmission for cost, performance, and reliability;
	PT-NWS4h.5:	demonstrate knowledge of firewall between trusted network and WAN;
	PT-NWS4h.6:	establish a Virtual Private Network (VPN) to form the infrastructure of the WAN;
	PT-NWS4h.7:	determine routers needed to connect with LAN; and
	PT-NWS4h.8:	demonstrate knowledge of interconnecting LANs using WAN services.
Standard:	**PT-NWS4i:**	The student will demonstrate knowledge of network security systems so as to:
Components:	**PT-NWS4i.1:**	demonstrate knowledge of security requirements and the need for data protection;
	PT-NWS4i.2:	demonstrate knowledge of access levels that need to be accommodated; and
	PT-NWS4i.3:	develop security plan.

Strand: **PT-NWS5**		**Network Installation and Configuration** Students install and configure computer networks.
Standard:	**PT-NWS5a:**	The student will install and configure computer networks so as to:
Components:	**PT-NWS5a.1:**	install information system application programs in accordance with requirements;
	PT-NWS5a.2:	install appropriate operating system and telecommunications hardware and software;
	PT-NWS5a.3:	operate server applications;
	PT-NWS5a.4:	load end-user software and configure appropriately;
	PT-NWS5a.5:	ensure that all multiuser aspects of the application function are operational; and
	PT-NWS5a.6:	resolve software compatibility issues.

Strand: **PT-NWS6**		**Network Administration and Monitoring** Students administer computer networks.
Standard:	**PT-NWS6a:**	The student will demonstrate knowledge of disaster recovery and business continuance so as to:
Components:	**PT-NWS6a.1:**	identify methods for avoiding common computer system disasters;
	PT-NWS6a.2:	identify common backup devices;
	PT-NWS6a.3:	identify the criteria for selecting a backup system;

	PT-NWS6a.4:	back up system;
	PT-NWS6a.5:	restore system; and
	PT-NWS6a.6:	compare/contrast streaming a file-backup system.

Strand:
PT-NWS7   **Network Maintenance and User Support Services**
Students maintain computer networks and provide customer support.

Standard: **PT-NWS7a:**   The student will identify technical support needed so as to:

Components: **PT-NWS7a.1:**   apply information and data analysis techniques;
                          PT-NWS7a.2:   identify skill-level needs; and
                          PT-NWS7a.3:   identify resources and risks.

Standard: **PT-NWS7b:**   The student will perform technical support needed so as to:

Component: **PT-NWS7b.1:**   employ technical and computer tools to perform task in the most cost-effective manner.

Standard: **PT-NWS7c:**   The student will perform software upgrades and fixes so as to:

Component: **PT-NWS7c.1:**   analyze operational problems.

Standard: **PT-NWS7d:**   The student will perform standard computer backup procedures so as to:

Components: **PT-NWS7d.1:**   recognize the need for regular backup procedures;
                          PT-NWS7d.2:   develop backup process;
                          PT-NWS7d.3:   identify battery backup equipment; and
                          PT-NWS7d.4:   install surge-suppression protection.

Standard: **PT-NWS7e:**   The student will perform network system maintenance so as to:

Components: **PT-NWS7e.1:**   demonstrate knowledge of the basic elements of network maintenance;
                          PT-NWS7e.2:   identify available diagnostic tools used for system maintenance;
                          PT-NWS7e.3:   identify maintenance procedures and processes;
                          PT-NWS7e.4:   identify problems using diagnostic tools;
                          PT-NWS7e.5:   document network system malfunction(s);
                          PT-NWS7e.6:   perform preventive maintenance procedures on computer and peripheral devices;
                          PT-NWS7e.7:   identify new or replacement networking components needed;
                          PT-NWS7e.8:   respond to system messages;
                          PT-NWS7e.9:   fix recoverable problems;
                          PT-NWS7e.10: restore systems;
                          PT-NWS7e.11: identify maintenance procedures and processes;
                          PT-NWS7e.12: establish a preventive maintenance plan;
                          PT-NWS7e.13: use a systems approach to analyze system problems, select solutions, test solutions, and implement accurate solution;
                          PT-NWS7e.14: create maintenance plan for regular integrity checks; and
                          PT-NWS7e.15: minimize impact of problems on productivity.

Standard: **PT-NWS7f:**   The student will troubleshoot problems so as to:

Components: **PT-NWS7f.1:**   demonstrate knowledge of basic troubleshooting steps;
                          PT-NWS7f.2:   identify available diagnostic tools used for system maintenance;

	PT-NWS7f.3:	perform appropriate analysis to identify cause of the problem;
	PT-NWS7f.4:	develop a problem-resolution plan; and
	PT-NWS7f.5:	document results and solutions.
Standard:	**PT-NWS7g:**	The student will troubleshoot data communications so as to:
Components:	**PT-NWS7g.1:**	isolate system faults in various types of networks, cables, data modems, and carrier systems;
	PT-NWS7g.2:	determine hardware communication faults using diagnostic tools; and
	PT-NWS7g.3:	identify network problems using network management tools (e.g., hardware, software carriers).

Strand:
PT-NWS8　　　　**Safety**
Students understand the importance of safety and regulatory compliance in the workplace.

Standard:	**PT-NWS8a:**	The student will apply safety practices in the laboratory so as to:
Components:	**PT-NWS8a.1:**	develop and implement a safety checklist;
	PT-NWS8a.2:	use safety equipment in the laboratory; and
	PT-NWS8a.5:	encourage others to employ safety practices.

Strand:
PT-MPD1

Customer Needs
Students analyze customer needs and requirements.

Standard:

PT-MPD1a: The student will produce a product to satisfy customer desires so as to:

Components:

PT-MPD1a.1: conduct in-depth investigation to identify customer needs;

PT-MPD1a.2: verify that needed resources are available for the production process;

PT-MPD1a.3: relate workers' skills to equipment management to set up equipment for the production process;

PT-MPD1a.4: use process-control data to monitor fabrication of the product;

PT-MPD1a.5: inspect the product to verify that it meets specifications;

PT-MPD1a.6: document product and process to ensure formal compliance with customer requirements; and

PT-MPD1a.7: check for specified quantities and proper documentation to prepare a final product for shipping or distribution.

Strand:
PT-MPD2

New Manufacturing Process
Students implement a manufacturing process based on need.

Standard:

PT-MPD2a: The student will implement new manufacturing process so as to:

Components:

PT-MPD2a.1: research the new manufacturing process;

PT-MPD2a.2: create standard operating procedures (SOPs) for new process;

PT-MPD2a.3: develop new tooling and fixtures;

PT-MPD2a.4: set up and program equipment for new processes;

PT-MPD2a.5: schedule and test new processes;

PT-MPD2a.6: monitor production-performance data for new processes;

PT-MPD2a.7 train employees on new processes; and

PT-MPD2a.8: prepare documentation on new processes.

Strand:
PT-MPD3

Safety
Students understand the importance of safety and regulatory compliance in the workplace.

Standard:

PT-MPD3a: The student will maintain a safe and productive workplace so as to:

Components:

PT-MPD3a.1: follow local, federal, and company regulations to perform environmental and safety inspections

PT-MPD3a.2: participate in emergency response teams to perform emergency drills;

PT-MPD3a.3: identify unsafe conditions and take corrective action; and

PT-MPD3a.4: provide safety orientation to train other employees in safe practices and emergency procedures.

Strand:
PT-MPD4   **Quality Assurance Processes**
Students use a systematic approach to provide evidence that products satisfy requirements,

Standard: **PT-MPD4a:**   The student will maintain quality and implement continuous improvement processes so as to:

Components: **PT-MPD4a.1:**   perform periodic internal quality audit activities;

                        PT-MPD4a.2:   check calibration of gauges and other data collection equipment;

                        PT-MPD4a.3:   suggest continuous improvements;

                        PT-MPD4a.4:   inspect materials at all stages of process to determine quality or condition;

                        PT-MPD4a.5:   document the results of quality tests; and

                        PT-MPD4a.6:   make adjustments to restore or maintain quality.

Strand:
PT-MPD5   **Communication Skills**
Students use information technology to express and interpret information.

Standard: **PT-MPD5a:**   The student will communicate with coworkers and/or customers to ensure production meets business requirements so as to:

Components: **PT-MPD5a.1:**   use speaking and presentation skills to effectively communicate safety, training, and job-specific;

                        PT-MPD5a.2:   be timely and accurate in communicating material specifications and delivery schedules; and

                        PT-MPD5a.3:   communicate production requirements and product specifications.

Strand:
PT-MPD6   **Facilitating Change**
Students identify and implement improvement opportunities.

Standard: **PT-MPD6a:**   The student will suggest and/or implement continuous improvement so as to:

Components: **PT-MPD6a.1:**   analyze data to identify potential problem;

                        PT-MPD6a.2:   monitor process capability;

                        PT-MPD6a.3:   monitor customer satisfaction;

                        PT-MPD6a.4:   measure and record product and process outcomes;

                        PT-MPD6a.5:   participate in making new work procedures;

                        PT-MPD6a.6:   implement approved recommendations; and

                        PT-MPD6a.7:   check that final product meets customer and business needs.

Strand:
PT-MPD7   **New Product Development**
Students develop new products based on need and customer requirements.

Standard: **PT-MPD7a:**   The student will produce new product to meet customer needs so as to:

Components: **PT-MPD7a.1:**   conduct research for new products;

                        PT-MPD7a.2:   obtain required supplies;

                        PT-MPD7a.3:   execute process to produce new product;

                        PT-MPD7a.4:   inspect product for deviations from specifications;

                        PT-MPD7a.5:   evaluate prototypes for manufacturability;

PT-MPD7a.6: solve production process problems; and

PT-MPD7a.7: deliver finished product to next stage in production process.

Strand:
PT-MPD8

Production Process
Students manage project tasks, timelines, and goals.

Standard:

PT-MPD8a: The student will improve production process so as to:

Components:

PT-MPD8a.1: conduct research for new products;

PT-MPD8a.2: propose changes to improve products and processes;

PT-MPD8a.3: develop production improvement goals;

PT-MPD8a.4: inspect product for deviations from customer and product standard(s); and

PT-MPD8a.5: correct product or process problems.

Strand:
PT-ENG1

Academics
Students apply English language arts, mathematics, science, and social studies content area skills.

Standard: **PT-ENG1a:** The student will apply concepts and processes as defined by the National Council of Teachers of Mathematics in *Principles and Standards for School Mathematics* so as to:

Components: **PT-ENG1a.1:** choose and/or create models that can be used to solve problems;

PT-ENG1a.2: select and use appropriate statistical methods to analyze data to help make decisions; and

PT-ENG1a.3: apply appropriate data collection and analysis methods and means of displaying data.

Standard: **PT-ENG1b:** The student will apply concepts and processes as defined by the National Research Council in the National Science *Education Standards* and by the American Association for the Advancement of Science in *Benchmarks for Science Literacy* so as to:

Components: **PT-ENG1b.1:** use systems of measurement to solve problems;

PT-ENG1b.2: convert units of measure between systems;

PT-ENG1b.3: differentiate between scalar and vector quantities including UCS coordinates;

PT-ENG1b.4: apply fundamental laws and principles relevant to engineering and technology; and

PT-ENG1b.5: use the relationships between energy, work, and power to solve a variety of problems involving mechanical, fluid, electrical, and thermal systems.

Standard: **PT-ENG1c:** The student will apply concepts and processes as defined in the *Standards for Technological Literacy: Content for the Study of Technology* so as to:

Components: **PT-ENG1c.1:** use mathematics, science, and technology concepts and processes to solve problems quantitatively in engineering projects involving design, development, or production in various technologies; and

PT-ENG1c.2: apply the core concepts of technology and recognize their relationships with engineering, science, and math, and other subjects.

Strand:
PT-ENG2

Information Technology Applications
Students use computers, networks, and communication technology to access, organize, process, transmit, and communicate information.

Standard: **PT-ENG2a:** The student will use information technology applications so as to:

Components: **PT-ENG2a.1:** use computer applications to solve problems;

PT-ENG2a.2: select and use different forms of communications technology; and

PT-ENG2a.3: collect, manage, and display data.

Strand:
PT-ENG3   **Technical Skills**
Students select and use technology tools to provide customer service.

Standard:	**PT-ENG3a:**	The student will apply technological content concepts and principles so as to:
Components:	**PT-ENG3a.1:**	discover how things work;
	PT-ENG3a.2:	use appropriate "tools of the trade"; and
	PT-ENG3a.3:	differentiate between related elements of engineering and technology.
Standard:	**PT-ENG3b:**	The student will model technical competence so as to:
Components:	**PT-ENG3b.1:**	use effective project and system management;
	PT-ENG3b.2:	use precision measuring methods and instruments;
	PT-ENG3b.3:	safely operate and use a variety of tools, machines, equipment, and materials; and
	PT-ENG3b.4:	apply elements of engineering and technology.

Strand:
PT-ENG4   **Design**
Students convert resources into processes or systems to meet needs and solve problems.

Standard:	**PT-ENG4a:**	The student will examine elements of the design process so as to:
Component:	**PT-ENG4a.1:**	examine the history of innovation and invention; and
	PT-ENG4a.2:	apply concepts of design.
Standard:	**PT-ENG4b:**	The student will demonstrate and apply the design process so as to:
Components:	**PT-ENG4b.1:**	design a system, product, or service; and
	PT-ENG4b.2:	access, test, record, organize, and evaluate information needed to alter the design of a product, system, or service.
Standard:	**PT-ENG4c:**	The student will use scientific and mathematical problem-solving skills to produce viable solutions to problems so as to:
Components:	**PT-ENG4c.1:**	demonstrate effective problem-solving techniques;
	PT-ENG4c.2:	apply appropriate scientific methodology;
	PT-ENG4c.3:	use effective critical-thinking skills; and
	PT-ENG4c.4:	use analytical tools and techniques to solve problems, construct tests, and evaluate data.

Strand:
PT-ENG5   **Safety, Health, and Environment**
Students understand the importance of safety and regulatory compliance in the workplace.

Standard:	**PT-ENG5a:**	The student will apply safety practices in the laboratory so as to:
Components:	**PT-ENG5a.1:**	develop and implement a safety checklist;
	PT-ENG5a.2:	use safety equipment in the laboratory; and
	PT-ENG5a.3:	encourage others to employ safety practices.

Strand:
PT-ENG6   **History of Electricity and Electronics**
Students understand the foundations of electricity and electronics.

Standard: **PT-ENG6a:**   The student will examine the historical developments in electricity and electronics so as to:

Components: **PT-ENG6a.1:**   define innovation and invention related to electronics;

PT-ENG6a.2:   research history of invention in electronics; and

PT-ENG6a.3:   make a presentation based upon historical research.

Strand:
PT-ENG7   **Mathematics for Electronics**
Students apply mathematical concepts to the study of electronics.

Standard: **PT-ENG7a:**   The student will apply the mathematical processes and applications that lead to solutions of electronic problems so as to:

Components: **PT-ENG7a.1:**   solve direct current (DC) circuit analysis problems using Ohm's Law;

PT-ENG7a.2:   calculate fundamental alternating current (AC) parameters;

PT-ENG7a.3:   manipulate scientific notation in problem solutions;

PT-ENG7a.4:   manipulate engineering notation in problem solutions and use in unit conversion;

PT-ENG7a.5:   derive algebraic equations to determine unknown values in circuits;

PT-ENG7a.6:   use Boolean algebra for design and analysis of digital circuits;

PT-ENG7a.7:   use a scientific calculator as a tool for problem solving; and

PT-ENG7a.8:   convert units of measurement from one system to another.

Strand:
PT-ENG8   **Testing Digital Circuits**
Students demonstrate the use of appropriate diagnostic equipment.

Standard: **PT-ENG8a:**   The student will demonstrate the use of appropriate diagnostic equipment so as to:

Components: **PT-ENG8a.1:**   select and apply appropriate test equipment or tools; and

PT-ENG8a.2:   analyze and apply observed logic states.

Strand:
PT-ENG9   **Digital Applications**
Students understand digital electronics.

Standard: **PT-ENG9a:**   The student will apply concepts of digital electronics so as to:

Components: **PT-ENG9a.1:**   draw and label the seven basic logic gates;

PT-ENG9a.2:   derive the truth tables of the seven basic logic gates; and

PT-ENG9a.3:   construct logic circuits using discrete components to emulate the seven basic gates.

Standard: **PT-ENG9b:**   The student will investigate how logic circuits and logic gates are used to perform digital operations so as to:

Component: **PT-ENG9b.1:**   investigate integrated circuits, electronic logic circuits, clocks, timers and flip-flops, digital counting circuits, advanced timers, and computer circuits; and

PT-ENG9b2:   assemble a digital trainer.

Strand:
PT-TDL1　　　　　　　　　　**Problem Solving and Critical Thinking**
　　　　　　　　　　　　　　　Students use information technology to define, test, and solve problems.

Standard:　　　　　　**PT-TDL1a:**　　The student will clarify the problems or issues to be addressed
　　　　　　　　　　　　　　　　　and the objectives so as to:

Components:　　　　　**PT-TDL1a.1:**　identify constraints and parameters;

　　　　　　　　　　　PT-TDL1a.2:　obtain and analyze available information and statistical data;

　　　　　　　　　　　PT-TDL1a.3:　generate alternative ideas, proposals, and solutions that would
　　　　　　　　　　　　　　　　　　solve the problem;

　　　　　　　　　　　PT-TDL1a.4:　evaluate alternative solutions;

　　　　　　　　　　　PT-TDL1a.5:　identify the best solution based on risks, costs, and benefits; and

　　　　　　　　　　　PT-TDL1a.6:　present the solution and the logic and the rationale for the
　　　　　　　　　　　　　　　　　　solution.

Standard:　　　　　　**PT-TDL1b:**　　The student will analyze and evaluate ideas, proposals, and
　　　　　　　　　　　　　　　　　solutions to the problem so as to:

Component:　　　　　**PT-TDL1b.1:**　evaluate the quality of information used to support the solution;
　　　　　　　　　　　　　　　　　　and

　　　　　　　　　　　PT-TDL1b.2:　evaluate the risks, costs, and benefits of testing and
　　　　　　　　　　　　　　　　　　implementing the solution.

Standard:　　　　　　**PT-TDL1c:**　　The student will develop solutions to performance problems
　　　　　　　　　　　　　　　　　using a structured problem-solving process so as to:

Components:　　　　　**PT-TDL1c.1:**　describe the problem completely and accurately using data and
　　　　　　　　　　　　　　　　　　graphs and charts;

　　　　　　　　　　　PT-TDL1c.2:　develop and present a comprehensive mapping of potential root
　　　　　　　　　　　　　　　　　　and indirect causes (e.g., troubleshooting diagram);

　　　　　　　　　　　PT-TDL1c.3:　identify and evaluate alternative solutions;

　　　　　　　　　　　PT-TDL1c.4:　test, monitor, and evaluate best solutions; and

　　　　　　　　　　　PT-TDL1c.5:　develop plans to fully implement solutions to address
　　　　　　　　　　　　　　　　　　performance problems.

Strand:
PT-TDL2　　　　　　　　　　**Maintaining Facilities, Equipment, and Supplies**
　　　　　　　　　　　　　　　Students use information technology to manage facilities, equipment, and
　　　　　　　　　　　　　　　supplies.

Standard:　　　　　　**PT-TDL2a:**　　The student will develop and manage repair plans so as to:

Components:　　　　　**PT-TDL2a.1:**　identify and describe automotive equipment
　　　　　　　　　　　　　　　　　　reliability/performance problems;

　　　　　　　　　　　PT-TDL2a.2:　determine causes of reliability/performance problems of
　　　　　　　　　　　　　　　　　　equipment, subsystems, and/or components including
　　　　　　　　　　　　　　　　　　electrical/electronics, fluid power, and mechanical systems and
　　　　　　　　　　　　　　　　　　computer-controlled systems;

　　　　　　　　　　　PT-TDL2a.3:　determine repair procedures and equipment, materials, parts,
　　　　　　　　　　　　　　　　　　supplies, and labor requirements to accomplish repairs; and

　　　　　　　　　　　PT-TDL2a.4:　present and explain report/findings to customer.

Strand:
PT-TDL3 **Facility and Mobile Equipment Maintenance**
Students understand preventive maintenance and repair strategies.

Standard: **PT-TDL3a:** The student will develop and manage preventative maintenance plans and systems so as to:

Components: **PT-TDL3a.1:** develop and manage preventative maintenance plans and systems to meet business and equipment manufacturer requirements; and

PT-TDL3a.2: monitor and evaluate the performance of maintenance plans and systems.

Standard: **PT-TDL3b:** The student will maintain and improve facilities, equipment, and system performance so as to:

Components: **PT-TDL3b.1:** develop and manage repair plans; and

PT-DCP3b.2: develop plans for improving facilities/equipment/system performance.

Strand:
PT-TDL4 **Management of Sales and Service Operations**
Students use technology to manage sales and service operations,

Standard: **PT-TDL4a:** The student will determine sales growth opportunities for new products and services so as to:

Components: **PT-TDL4a.1:** analyze changing customer/market needs;

PT-TDL4a.2: evaluate competitor products/services and pricing strategies;

PT-TDL4a.3: determine future demand for potential products and services; and

PT-TDL4a.4: identify most promising products and services.

Standard: **PT-TDL4b:** The student will sell transportation services so as to:

Components: **PT-TDL4b.1:** establish customer relationship;

PT-TDL4b.2: determine customer needs;

PT-TDL4b.3: describe and explain alternative products, services, and pricing;

PT-TDL4b.4: assist customer in making decisions;

PT-TDL4b.5: close customer sale; and

PT-TDL4a.6: complete sales transaction.

Strand:
PT-TDL5 **Employability and Career Development**
Students use skills to plan career paths and pursue career opportunities.

Standard: **PT-TDL5a:** The student will locate appropriate information on organizational policies in handbooks and manuals so as to:

Component: **PT-TDL5a.1:** select the appropriate document(s) as referenced for the situation.

Standard: **PT-TDL5b:** The student will demonstrate flexibility and willingness to learn new knowledge and skills so as to:

Components: **PT-TDL5b.1:** display initiative and open-mindedness in accomplishing a work challenge; and

PT-TDL5b.2: complete all tasks thoroughly and identify strategies for accomplishing job.

Strand:
PT-SAS1   **Problem Solving and Critical Thinking**
Students use information technology to define, test, and solve problems.

Standard: **PT-SAS1a:**   The student will clarify the problems or issues to be addressed
                                                    and the objectives so as to:

Components: **PT-SAS1a.1:**   identify constraints and parameters;

                                 PT-SAS1a.2:   obtain and analyze available information and statistical data;

                                 PT-SAS1a.3:   generate alternative ideas, proposals, and solutions that would
                                                     solve the problem;

                                 PT-SAS1a.4:   evaluate alternative solutions;

                                 PT-SAS1a.5:   identify the best solution based on risks, costs, and benefits; and

                                 PT-SAS1a.6:   present the solution and the logic and the rationale for the
                                                     solution.

Standard: **PT-SAS1b:**   The student will analyze and evaluate ideas, proposals, and
                                                     solutions to the problem so as to:

Components: **PT-SAS1b.1:**   evaluate the quality of information used to support the solution;
                                                     and

                                 PT-SAS1b.2:   evaluate the risks, costs, and benefits of testing and
                                                     implementing the solution.

Standard: **PT-SAS1c:**   The student will develop solutions to performance problems
                                                     using a structured problem-solving process so as to:

Components: **PT-SAS1c.1:**   describe the problem completely and accurately using data and
                                                     graphs and charts;

                                 PT-SAS1c.2:   develop and present a comprehensive mapping of potential root
                                                     and indirect causes (e.g., troubleshooting diagram);

                                 PT-SAS1c.3:   identify and evaluate alternative solutions;

                                 PT-SAS1c.4:   test, monitor, and evaluate best solutions; and

                                 PT-SAS1c.5:   develop plans to fully implement solutions to address
                                                     performance problems.

Strand:
PT-SAS2   **Maintaining Facilities, Equipment, and Supplies**
Students use information technology to manage facilities, equipment, and
supplies.

Standard: **PT-SAS2a:**   The student will develop and manage repair plans so as to:

Components: **PT-SAS2a.1:**   identify and describe automotive equipment
                                                     reliability/performance problems;

                                 PT-SAS2a.2:   determine causes of reliability/performance problems of
                                                     equipment, subsystems, and/or components including
                                                     electrical/electronics, fluid power, and mechanical systems and
                                                     computer-controlled systems;

                                 PT-SAS2a.3:   determine repair procedures and equipment, materials, parts,
                                                     supplies, and labor requirements to accomplish repairs; and

                                 PT-SAS2a.4:   present and explain report/findings to customer.

Strand: **PT-SAS3**		**Facility and Mobile Equipment Maintenance** Students understand preventive maintenance and repair strategies.
Standard:	**PT-SAS3a:**	The student will develop and manage preventative maintenance plans and systems so as to:
Components:	**PT-SAS3a.1:**	develop and manage preventative maintenance plans and systems to meet business and equipment manufacturer requirements; and
	PT-SAS3a.2:	monitor and evaluate the performance of maintenance plans and systems.
Standard:	**PT-SAS3b:**	The student will maintain and improve facilities, equipment, and system performance so as to:
Components:	**PT-SAS3b.1:**	develop and manage repair plans; and
	PT-SAS3b.2:	develop plans for improving facilities/equipment/system performance.
Strand: **PT-SAS4**		**Management of Sales and Service Operations** Students use technology to manage sales and service operations,
Standard:	**PT-SAS4a:**	The student will determine sales growth opportunities for new products and services so as to:
Components:	**PT-SAS4a.1:**	analyze changing customer/market needs;
	PT-SAS4a.2:	evaluate competitor products/services and pricing strategies;
	PT-SAS4a.3:	determine future demand for potential products and services; and
	PT-SAS4a.4:	identify most promising products and services.
Standard:	**PT-SAS4b:**	The student will sell transportation services so as to:
Components:	**PT-SAS4b.1:**	establish customer relationship;
	PT-SAS4b.2:	determine customer needs;
	PT-SAS4b.3:	describe and explain alternative products, services, and pricing;
	PT-SAS4b.4:	assist customer in making decisions;
	PT-SAS4b.5:	close customer sale; and
	PT-SAS4a.6:	complete sales transaction.
Strand: **PT-SAS5**		**Employability and Career Development** Students use skills to plan career paths and pursue career opportunities.
Standard:	**PT-SAS5a:**	The student will locate appropriate information on organizational policies in handbooks and manuals so as to:
Component:	**PT-SAS5a.1:**	select the appropriate document(s) as referenced for the situation.
Standard:	**PT-SAS5b:**	The student will demonstrate flexibility and willingness to learn new knowledge and skills so as to:
Components:	**PT-SAS5b.1:**	display initiative and open-mindedness in accomplishing a work challenge; and
	PT-SAS5b.2:	complete all tasks thoroughly and identify strategies for accomplishing job.