

Professional Technical Studies: Information Technology Cluster
Information Support & Services Pathway

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.