Colorado CTE

Information Support and Services (2015): Grades 9, 10, 11, 12, Higher Education

Adopted 2015

Perform computer user support to maintain service. ITSS.01

01. Employ effective listening skills when working with client. ITSS.01.01

- a. Identify support needs and resources, skill level needs. ITSS.01.01.A
- b. Apply information and data analysis techniques. ITSS.01.01.B
- c. Define scope of work to meet customer needs. ITSS.01.01.C

02. Employ customer service principles when working with consumers ITSS.01.02

- a. Respond to user questions. ITSS.01.02.A
- b. Maintain timeliness and professionalism during interaction. ITSS.01.02.B
- c. Communicate and document technical support provided. ITSS.01.02.C

03. Evaluate and follow-up on customer service provided ITSS.01.03

- a. When appropriate, follow up support session for evaluation. ITSS.01.03.A
- b. Understand the steps to take to create improvement plan when needed. ITSS.01.03.B

04. Analyze symptoms of problem and use diagnostic skills ITSS.01.04

- a. Evaluate present data and system configuration. ITSS.01.04.A
- b. Provide troubleshooting for hardware/software. ITSS.01.04.B
- c. Employ evaluative tools (software/recordings) to check work. ITSS.01.04.C

05. Employ effective problem-solving skills in performing support, maintenance and/or repair. ITSS.01.05

- a. Formulate a support plan/confirm plan with client. ITSS.01.05.A
- b. Diagnose problems within system. ITSS.01.05.B
- c. Perform technical functions required by customer/user. ITSS.01.05.C
- d. Employ appropriate hardware and software tools to perform task in the most cost-effective manner. ITSS.01.05.D

Skip to main content

Manage software systems to maintain and update service. ITSS.02

01. **Perform configuration management activities** ITSS.02.01
    a. Demonstrate knowledge of identification control functions, version management and interface. ITSS.02.01.A
    b. Select appropriate tools for configuration management. Specify baseline and software life-cycle phases. ITSS.02.01.B
    c. Determine standards to be applied (e.g., international, industry, military). ITSS.02.01.C
    d. Assess the impact of changes that affect interfaces. ITSS.02.01.D

02. **Evaluate application software packages** ITSS.02.02
    a. Perform work flow analysis to determine user needs, and software and physical configuration audit ITSS.02.02.A
    b. Evaluate appropriateness of software for specific projects. ITSS.02.02.B
    c. Prepare a cost-benefit analysis for a software package. ITSS.02.02.C
    d. Document results of the software evaluation. ITSS.02.02.D
    e. Test the functionality of proposed software configuration for evaluation. ITSS.02.02.E

Utilize hardware design, operation and maintenance knowledge and skills to provide computer user support. ITSS.03

01. **Identify the purpose of computer components.** ITSS.03.01
    a. Demonstrate knowledge of the CPU architecture and sockets. ITSS.03.01.A
    b. Demonstrate knowledge of motherboard/CPU (North/Southbridge, L1/L2, multi-core, bus, 32/64 bit, form-factor, slots, etc). ITSS.03.01.B
    c. Demonstrate knowledge of Chipsets/BIOS and their drivers. ITSS.03.01.C
    d. Demonstrate knowledge of memory modules (RIMM, Dimm, SDRAM, DDR, DDR2, etc). ITSS.03.01.D
    e. Demonstrate knowledge of hard drive technologies (IDE, EIDE, SATA, SCSI, etc). ITSS.03.01.E
    f. Demonstrate knowledge of hard drive setup and troubleshooting. ITSS.03.01.F
    g. Demonstrate knowledge of video cards and slots (VGA, XVGA, VESA, SLI, etc). ITSS.03.01.G
    h. Demonstrate knowledge of I/O ports (serial, parallel, USB, PS/2, Firewire, etc). ITSS.03.01.H
    i. Demonstrate knowledge of modem/NIC ports and troubleshooting their problems. ITSS.03.01.I
    j. Demonstrate knowledge of INPUT devices (keyboard, mouse, touchpad, cameras, scanners, midis, barcode scanners, etc). ITSS.03.01.J
    k. Demonstrate knowledge of OUTPUT devices (printers, CRTs, LCD monitors, network devices). ITSS.03.01.K
    l. Demonstrate knowledge of communication devices and how they connect to and share data with computers. ITSS.03.01.L

Skip to main content

m. Demonstrate knowledge of power and power supplies and how associated problems can be solved. ITSS.03.01.M

n. Demonstrate knowledge of peculiar features and problems of address and portable devices. ITSS.03.01.N

02. Explain the purpose of computer components and how they work together as a system. ITSS.03.02

a. Explain data bus, direct back plan, expansion bus. ITSS.03.02.A

b. Explain processing cycle. ITSS.03.02.B

03. Demonstrate knowledge to build or install computer system. ITSS.03.03

a. Identify primary PC components and the functions of each. ITSS.03.03.A

b. Demonstrate knowledge of how hardware components interact and how conflicts arise. ITSS.03.03.B

c. Access needed information using manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts). ITSS.03.03.C

d. Secure supplies and resources. ITSS.03.03.D

e. Demonstrate knowledge of error messages and symptoms of hardware failures. ITSS.03.03.E

f. Install mainboard (with memory/CPU). ITSS.03.03.F

g. Connect peripherals and expansion cards to/in mainboard. ITSS.03.03.G

h. Install drives (HDD, FDD, CD, CDR) both EIDE and SATA. ITSS.03.03.H

i. Employ appropriate safety precautions when working with PC. ITSS.03.03.I

j. Configure hardware system. ITSS.03.03.J

k. Verify system operation. ITSS.03.03.K

l. Document system installation activities. ITSS.03.03.L

m. Backup system and configuration. ITSS.03.03.M

n. Test all applications. ITSS.03.03.N

o. Restore system and configuration. ITSS.03.03.O

p. Transfer system settings and files from old system to new. ITSS.03.03.P

04. Demonstrate ability to couple troubleshooting skills with hardware knowledge to solve client problems. ITSS.03.04

a. Know startup sequence and beep codes. ITSS.03.04.A

b. Identify priorities and interrupts at system level. ITSS.03.04.B

c. Replace RAM chips (different types). ITSS.03.04.C

d. Test system using diagnostic tools/software. ITSS.03.04.D

Skip to main content

e. Identify problems in the operating system and related hardware. ITSS.03.04.E

f. Differentiate between hardware and software failure. ITSS.03.04.F

g. Update flash memory (BIOS). ITSS.03.04.G

h. Demonstrate hard drive maintenance procedures (defrag/scan (2) clear caches, etc). ITSS.03.04.H

i. Gather information on problem from user. ITSS.03.04.I

j. Conduct appropriate diagnostic tests. ITSS.03.04.J

k. Repair/replace malfunctioning hardware. ITSS.03.04.K

l. Reinstall software as needed. ITSS.03.04.L

m. Demonstrate backup and recovery. ITSS.03.04.M

n. Restore system to various states (safe modes, previous date, etc.). ITSS.03.04.N

05. Identify and implement quality assurance processes to ensure a quality product. ITSS.03.05

a. Analyze technical support needs including internal and external documentation. ITSS.03.05.A

b. Perform product maintenance activities (i.e., product and documentation updates, user requested enhancements, etc.). ITSS.03.05.B

c. Perform customer support activities as required by the user ITSS.03.05.C

Demonstrate and apply knowledge of Operating System design, operation and maintenance to perform information support and service tasks. ITSS.04

01. Demonstrate knowledge of Operating System components in the building and deployment of computer systems. ITSS.04.01

a. Demonstrate knowledge of components of O/S (explorer, Control panel, etc.). ITSS.04.01.A

b. Demonstrate knowledge of startup sequence of O/Ss. ITSS.04.01.B

02. Knowledge of Operating System components in the repair and maintenance of computer systems. ITSS.04.02

a. Connect stations to each other and to Internet. ITSS.04.02.A

b. Connect stations to peripheral devices, especially printers. ITSS.04.02.B

c. Protect stations from viruses, malwares, adwares, security breaches, etc. ITSS.04.02.C

d. Test integrity and drivers of all devices recognized by O/S. ITSS.04.02.D

e. Recover from system errors. ITSS.04.02.E

f. Upgrade ability from one generation of O/S to the next. ITSS.04.02.F

g. Install new hardware (drives, cards, etc.) on O/S. ITSS.04.02.G

Demonstrate the use of networking concepts to develop a ne

Skip to main content

01. Describe basic network classifications, topologies and network operating systems ITSS.05.01

a. Interpret basic networking terminology. ITSS.05.01.A

b. Demonstrate and differentiate between LANs and WANs. ITSS.05.01.B

c. Identify the basic network topologies (e.g., star, ring, tree, network, irregular). ITSS.05.01.C

d. Identify the basic broadcast topologies (e.g., star ring, bus). ITSS.05.01.D

e. Identify differences between O/Ss (Windows/Linux/Mac/DOS). ITSS.05.01.E

02. Demonstrate the use of networking concepts in the support and maintenance of the computers on the network. ITSS.05.02

a. Demonstrate knowledge of the characteristics and uses of network components (e.g., hub, switches, routers, firewall). ITSS.05.02.A

b. Differentiate between a physical and logical topology. ITSS.05.02.B

c. Demonstrate knowledge of LAN transmission methods, standards and protocols. ITSS.05.02.C

Employ knowledge of information system analysis and design to evaluate information systems. ITSS.06

01. Initiate a system project. ITSS.06.01

a. Identify the phases in a system project. ITSS.06.01.A

b. Select basic fact-gathering techniques to be used. ITSS.06.01.B

c. Define the scope of the systems project. ITSS.06.01.C

d. Conduct a preliminary investigation. ITSS.06.01.D

02. Evaluate applications within the information system. ITSS.06.02

a. Design a framework for evaluating information system functions. ITSS.06.02.A

b. Design a framework for evaluating individual applications. ITSS.06.02.B

c. Recommend new features or enhancements to existing tools. ITSS.06.02.C

Employ system installation and maintenance skills when setting-up and maintaining an information system to demonstrate application of fundamental system knowledge. ITSS.07

01. Describe the life cycle of an information system. ITSS.07.01

a. Research the concept of information system life cycles in accordance with an appropriate schedule. ITSS.07.01.A

02. Manage backup and recovery, both on- and off-site. ITSS.07.02

a. Implement backup procedures in accordance with an appropriate schedule and recovery procedures as needed. ITSS.07.02.A

03. Identify the problem. ITSS.07.03

a. Demonstrate knowledge of troubleshooting steps. ITSS.07.03.A

b. Analyze impact of problems on productivity and minimize downtime. ITSS.07.03.B

04. Evaluate problem-solving processes and outcomes. ITSS.07.04

a. Evaluate problem-solving outcomes to determine whether the problem was solved as intended. ITSS.07.04.A

Skip to main content

b. Evaluate whether the process was applied in an efficient and responsible manner. ITSS.07.04.B

c. Assess the validity and usefulness of the outcomes. ITSS.07.04.C

d. Determine needed follow-up actions. ITSS.07.04.D

Employ system administration and control skills to monitor an information system. ITSS.08

01. Perform general system administration tasks. ITSS.08.01

a. Understand project management. ITSS.08.01.A

b. Set up/maintain user accounts on multiple systems. ITSS.08.01.B

c. Participate in the evaluation, analysis, and recommendation of technical computing products. ITSS.08.01.C

d. Document performance problems. ITSS.08.01.D

e. Prepare required reports. ITSS.08.01.E

Employ technical writing and documentation skills to keep records necessary for an information system. ITSS.09

01. Employ sound technical writing skills. ITSS.09.01

a. Define/prioritize communication needs. ITSS.09.01.A

b. Specify project objectives. ITSS.09.01.B

c. Estimate time, materials, and capabilities needed to complete assignment. ITSS.09.01.C

02. Employ technical research to both evaluate applications and systems as well as find drivers and solutions. ITSS.09.02

a. Identify target audience. ITSS.09.02.A

b. Define research questions. ITSS.09.02.B

c. Determine priorities for the information that should be gathered. ITSS.09.02.C

d. Identify potential sources of information and subject matter experts. ITSS.09.02.D

e. Utilize target audience and user group as a key information source. ITSS.09.02.E

f. Evaluate potential sources of information based on established criteria (e.g., affordability, relevance). ITSS.09.02.F

g. Gather information from appropriate degrees. ITSS.09.02.G

h. Determine the accuracy and completeness of the information gathered. ITSS.09.02.H

03. Design technical documentation. ITSS.09.03

a. Define scope and purpose of documentation. ITSS.09.03.A

b. Specify standards for documentation, including critical success criteria. ITSS.09.03.B

c. Identify delivery options, evaluate cost-effectiveness of each delivery option and select tools appropriate for task purpose. ITSS.09.03.C

Skip to main content

d. Plan information flow. ITSS.09.03.D

e. Select writing style and tone appropriate for given documentation, determine level of detail needed, and identify visuals appropriate for given documentation. ITSS.09.03.E

f. Provide feedback on design to development team/individual. ITSS.09.03.F

04. Write technical reports and effective field notes. ITSS.09.04

a. Determine audience. ITSS.09.04.A

b. Access needed information using standard references and sources. ITSS.09.04.B

c. Identify type of report needed. ITSS.09.04.C

d. Compile relevant data. ITSS.09.04.D

e. Organize data into charts and graphs. ITSS.09.04.E

f. Draw conclusions in appropriate visual representation. ITSS.09.04.F

g. Outline and draft report. ITSS.09.04.G

h. Edit report (e.g., check spelling, grammar, punctuation, sentence structure, accuracy of content). ITSS.09.04.H

i. Review report with peers and revise report as needed based on feedback. ITSS.09.04.I

j. Proofread revised report. ITSS.09.04.J

k. Present reports. ITSS.09.04.K

Identify and implement quality assurance processes to maximize information system operation. ITSS.10

01. Evaluate tools for quality characteristics. ITSS.10.01

a. Demonstrate knowledge of the characteristics and functions of available quality tools. ITSS.10.01.A

b. Select quality tool(s) appropriate to situation. ITSS.10.01.B

02. Apply quality cost implications to a project. ITSS.10.02

a. Establish cost/quality objectives. ITSS.10.02.A

b. Classify costs (e.g., direct and indirect, fixed and variable, methods and standards). ITSS.10.02.B

c. Classify quality costs (e.g., prevention, evaluation, pre-delivery failure, post-delivery failure). ITSS.10.02.C

d. Interpret quality cost reports. ITSS.10.02.D

e. Establish guidelines for liability prevention. ITSS.10.02.E

f. Identify safety terms of product. ITSS.10.02.F

g. Identify safety responsibility within organization. ITSS.10.02.G

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Explain the purpose of computer components and how they work together as a system. ITSS.11.01

maintenance knowledge and skills to provide computer user support. ITSS.11

a. Explain data bus, direct back plan, expansion bus. ITSS.11.01.A

b. Explain processing cycle. ITSS.11.01.B