

# 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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
- 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

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**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

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**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

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**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
- 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

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**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

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**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

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**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
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**Demonstrate the use of networking concepts to develop a network.** ITSS.05

**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
  - 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
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**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
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**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

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**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

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**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
- 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

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**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
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**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
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**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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**Utilize hardware design, operation and maintenance knowledge and skills to provide computer user support.** ITSS.11

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

- a. Explain data bus, direct back plan, expansion bus. ITSS.11.01.A
- b. Explain processing cycle. ITSS.11.01.B