Colorado CTE

IT Cluster (2015): Grades 9, 10, 11, 12, Higher Education

Adopted 2015

Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information. ITCO.01

01. **Develop positive customer relations to build and maintain a customer base in the IT industry.** ITCO.01.01
    a. Explain the difference between external and internal customers in IT organizations. ITCO.01.01.A
    b. Demonstrate knowledge of organization's offerings and of customers' importance to the organization. ITCO.01.01.B
    c. Demonstrate ability to assist customers in a professional manner. Define acronyms; explain complex technical ideas in layperson's terminology. ITCO.01.01.C
    d. Effectively use organizational protocols and systems to fulfill customer service requirements. ITCO.01.01.D
    e. Explain the concept of a Service-Oriented Architecture (SOA) and how it is utilized in IT to create better customer satisfaction for organizations. ITCO.01.01.E

02. **Perform scheduling functions to meet customer needs.** ITCO.01.02
    a. Schedule customer appointments. ITCO.01.02.A
    b. Document results of customer appointments. ITCO.01.02.B

Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation. ITCO.02

01. **Use product/service design processes and guidelines to produce a quality IT product/service.** ITCO.02.01
    a. Summarize the process of IT product/service design. ITCO.02.01.A
    b. Identify the facts and requirements within a problem. ITCO.02.01.B
    c. Document a Quality Assurance program (includes creating plan and evaluating effectiveness). ITCO.02.01.C
    d. Create a solution for the problem. ITCO.02.01.D

02. **Implement problem-solving processes to evaluate and verify the project/service.** ITCO.02.02
    a. Test/evaluate the solution. ITCO.02.02.A
    b. Reconfigure the solution to better match the requirements of the problem. ITCO.02.02.B

Skip to main content

c. Demonstrate the use of information organization principles. ITCO.02.02.C

Understand organizational behavior (roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect performance and product quality. ITCO.03

01. Analyze and summarize the use of IT in business. (to enhance effectiveness). ITCO.03.01

a. Explain how IT into various types of business models. ITCO.03.01.A

b. Explain why and when outsourcing is used by organizations. ITCO.03.01.B

c. Create and explain a standard generic organizational chart. ITCO.03.01.C

02. Explain the difference between Private Sector, Public Sector, and Not-For-Profit organizations. ITCO.03.02

a. Explain why private sector organizations exist and how they work. ITCO.03.02.A

b. Explain why public sector organizations exist and how they work. ITCO.03.02.B

c. Explain why not-for-profit sector organizations exist and how they work. ITCO.03.02.C

d. Explain when and why various organizations implement a Research and Development (R&D) department . ITCO.03.02.D

03. Explain how government intercedes with various organizations to implement effective legal and ethical boundaries. ITCO.03.03

a. Describe how various government entities exercise control over organizations in local, regional, national or international environments. ITCO.03.03.A

b. Describe how governments can create incentives to lure an organization from one geographical location to another. ITCO.03.03.B

Know and understand the importance of professional ethics, legal responsibilities and employability skills. Explore, plan, and effectively manage careers. ITCO.04

01. Apply standard practices and behaviors that meet legal and ethical responsibilities and exhibit positive cyber-citizenry to understand legal issues faced by IT professionals. ITCO.04.01

a. Explain legal issues faced by IT professionals. ITCO.04.01.A

b. Summarize the rights and responsibilities of IT workers. ITCO.04.01.B

c. Identify ethical issues common to the IT field. ITCO.04.01.C

d. Describe the role of copyright and intellectual property and the use of materials created by others. ITCO.04.01.D

02. Identify and explore careers in the IT field. ITCO.04.02

a. Demonstrate an understanding of the various IT careers in Private, Public, and non-profit sectors. ITCO.04.02.A

b. Research and explain industry certifications in IT and the process for pursuing them. ITCO.04.02.B

c. Identify and explore post-secondary opportunities in IT. ITCO.04.02.C

Skip to main content

Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster. ITCO.05

01. **Demonstrate knowledge of the hardware components associated with information systems.** ITCO.05.01
    a. Explain the fundamentals of operating systems. ITCO.05.01.A
    b. Explain the role of number systems in information systems. ITCO.05.01.B
    c. Identify computer classifications and hardware. ITCO.05.01.C
    d. Describe the function of computers. ITCO.05.01.D
    e. Explain the difference between "memory" and "storage". ITCO.05.01.E

02. **Compare classes of software associated with the development and maintenance information systems to develop software and maintain computer systems.** ITCO.05.02
    a. Explain the key functions and applications of software. ITCO.05.02.A
    b. Describe the range of languages used in software development. ITCO.05.02.B
    c. Summarize how data is organized in software development. ITCO.05.02.C
    d. Explain new and emerging classes of software. ITCO.05.02.D

03. **Identify and compare new IT trends and technologies to build an understanding of their potential influence on IT practices.** ITCO.05.03
    a. Explain measurement techniques for increased productivity due to information support implementation. ITCO.05.03.A
    b. Identify new IT technologies. ITCO.05.03.B

04. **Summarize basic data communications components and trends to maintain and update IT systems.** ITCO.05.04
    a. Explain data communications procedures, equipment and media. ITCO.05.04.A
    b. Explain data transmission encoding and protocols. ITCO.05.04.B
    c. Explain the differences between local and wide area networks. ITCO.05.04.C
    d. Summarize data communication trends and issues. ITCO.05.04.D

05. **Demonstrate technical knowledge of the Internet.** ITCO.05.05
    a. Describe current Internet protocols. ITCO.05.05.A
    b. Summarize Internet security issues and systems available for addressing them. ITCO.05.05.B
    c. Demonstrate the use of an Internet connection. ITCO.05.05.C
    d. Explain the components of Internet software. ITCO.05.05.D
    e. Explain the features and functions of Web browsing software. ITCO.05.05.E
    f. Install internet software for use on an operating system. ITCO.05.05.F
    g. Explain Service Oriented Architecture (SOA) and how e-commerce works in an SOA environment. ITCO.05.05.G
    h. Explain how the cloud works. ITCO.05.05.H

Skip to main content

i. Explain how intranets work. ITCO.05.05.I

06. Perform standard computer backup procedures to protect IT information. ITCO.05.06

a. Explain the need for regular backup procedures. ITCO.05.06.A

b. Configure, perform and maintain backup procedures. ITCO.05.06.B

c. Explain the difference between complete and differential backups. ITCO.05.06.C

07. Recognize and analyze potential IT security threats to develop and maintain security requirements. ITCO.05.07

a. Describe potential security threats to information systems. ITCO.05.07.A

b. Identify the range of security needs and the problems that can occur due to security lapses. ITCO.05.07.B

c. Assess security threats. (e.g. DOS-denial of service, intrusion, detection/prevention). ITCO.05.07.C

d. Develop risk management plans to address security threats. ITCO.05.07.D

e. Identify software and hardware solutions to help avert security threats. ITCO.05.07.E

f. Implement plans to address security procedures. ITCO.05.07.F

08. Identify and describe quality assurance concepts to develop an understanding of the requirements for quality IT products/services. ITCO.05.08

a. Explain the history and standards of key quality management initiatives. ITCO.05.08.A

b. Explain the terminology, role and benefits of quality within an organization. ITCO.05.08.B

c. Summarize the elements of a quality management system. ITCO.05.08.C

d. Explain the need for quality of service. ITCO.05.08.D

Know and understand the importance of IT project management concepts, tools and techniques and the role teams play in the IT field. ITCO.06

01. Explain the definition of a project and the tools required to establish the project. ITCO.06.01

a. Define a project as it relates to the IT field. ITCO.06.01.A

b. Explain the project plan and its components. ITCO.06.01.B

c. Demonstrate the knowledge of project planning methodologies and tools. ITCO.06.01.C

d. Compare standard project management and the systems development life cycle (SDLC). ITCO.06.01.D

02. Understand the importance of cross-functional project teams to achieve IT project goals. ITCO.06.02

Skip to main content

a. Explain the role of a project manager (PM). ITCO.06.02.A

b. Explain the role of a project sponsor. ITCO.06.02.B

c. Explain the role of project team members. ITCO.06.02.C

d. Explain the difference and compare the three organizational models (Functional, Matrix and Projectized). ITCO.06.02.D

e. Summarize the importance of cross-functional teams in achieving IT project goals. ITCO.06.02.E

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03. Explain the project process and triple constraint of projects. ITCO.06.03

a. Explain the concept of a project constraint. ITCO.06.03.A

b. Explain the constraint of time. ITCO.06.03.B

c. Explain the constraint of cost. ITCO.06.03.C

d. Explain the constraint of scope - what scope is, and how projects go out of scope. ITCO.06.03.D