

# Cloud Computing (11.44700) (2021)

Adopted 2021

Demonstrate employability skills required by business and industry. [IT-CC-1](#)

1. Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities. [IT-CC-1.1](#)
2. Demonstrate creativity by asking challenging questions and applying innovative procedures and methods. [IT-CC-1.2](#)
3. Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations. [IT-CC-1.3](#)
4. Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity. [IT-CC-1.4](#)
5. Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team-work skills. [IT-CC-1.5](#)
6. Present a professional image through appearance, behavior, and language. [IT-CC-1.6](#)

Describe the structure and features of cloud computing, including services, benefits, and types of cloud computing. [IT-CC-2](#)

1. Define cloud computing and its impact on business and society. [IT-CC-2.1](#)
2. Identify and compare the benefits of cloud computing over on-premises computing. [IT-CC-2.2](#)
3. Compare the services offered by the main cloud computing providers, such as Amazon, Microsoft, Google, and others. [IT-CC-2.3](#)
4. Compare the types of cloud computing, including Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS), and describe scenarios where each could be used to improve a business. [IT-CC-2.4](#)
5. Explain the purpose of region, availability zone, and edge location and the connections among them. [IT-CC-2.5](#)

Demonstrate how to store and share content

1. Identify features and functions of commonly used cloud services. [IT-CC-3.1](#)

**in the cloud.** IT-CC-3

2. Access and navigate to commonly used services in cloud computing consoles. IT-CC-3.2
3. Analyze how cloud services are used in industry. IT-CC-3.3
4. Explain the functions of a domain name system (DNS) IT-CC-3.4
5. Create an object storage bucket, such as AWS S3, Azure Blob Storage, and others. IT-CC-3.5
6. Explain the benefits and uses of a content delivery network. IT-CC-3.6
7. Configure web content distribution via edge locations and attach it to a website. IT-CC-3.7
8. Identify the benefits, features, and use cases of different types of cloud storage. IT-CC-3.8
9. Analyze a use case and recommend the best type of virtual storage for the particular situation. IT-CC-3.9
10. Create an appropriate storage volume or physical record and attach it to a virtual computing instance. IT-CC-3.10
11. Create a virtual computing instance that hosts a simple website. Upload to online career portfolio. IT-CC-3.11

**Utilize best practices in monitoring and securing content stored in the cloud.** IT-CC-4

1. Recognize best practices for identity and access management (IAM). IT-CC-4.1
2. Analyze the cultural and societal impacts of cloud security. IT-CC-4.2
3. Differentiate among a role, user, and policy in cloud security. IT-CC-4.3
4. Use a process to resolve vulnerabilities in a web server. IT-CC-4.4
5. Determine whether security best practices are being followed and recommend steps to fix any security lapses. IT-CC-4.5
6. Identify the best cloud security service for a given scenario. IT-CC-4.6
7. Use an IAM system to set up a text alert event. IT-CC-4.7
8. Compare monitoring and logging services. IT-CC-4.8
9. Identify potential vulnerabilities on the network and propose solutions to secure the network to protect content stored in the cloud. IT-CC-4.9

**Design, develop, and deploy a virtual private network (VPN).** IT-CC-5

1. Describe features and benefits of load balancing. IT-CC-5.1

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2. **Attach a load balancer to a webpage.** IT-CC-5.2

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  3. **Evaluate the performance of a load balancer.** IT-CC-5.3

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  4. **Compare relational and nonrelational databases.** IT-CC-5.4

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  5. **Compare online transaction processing and online analytics processing.** IT-CC-5.5

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  6. **Describe the benefits of caching data.** IT-CC-5.6

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  7. **Use a template infrastructure as code (IaC) tool to build a virtual private network (VPN), such as AWS Virtual Private Cloud, Azure Virtual Network, and others. Upload to online career portfolio.** IT-CC-5.7
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**Assess the impact (advantages and disadvantages) of emerging technologies in cloud computing.** IT-CC-6

1. **Describe machine learning and explain its impact on society, business, and technology.** IT-CC-6.1

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  2. **Identify potential use cases for emerging technology in the cloud.** IT-CC-6.2

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  3. **Use calculator tools to assess value propositions of using cloud technology, including monthly cost and total cost.** IT-CC-6.3

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  4. **Identify cloud services that can analyze and protect data and manage networks.** IT-CC-6.4

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  5. **Explain benefits of blockchain technologies.** IT-CC-6.5

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  6. **Explain the infrastructure of cloud development kits or services.** IT-CC-6.6

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  7. **Use a software development framework to model and provision a cloud application.** IT-CC-6.7
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**Detect and resolve common security alerts using the most efficient methods for given situations.** IT-CC-7

1. **Describe the shared responsibility security model.** IT-CC-7.1

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  2. **Determine security responsibility for cloud resources.** IT-CC-7.2

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  3. **Analyze how the shared security model accounts for common threats to the cloud computing model.** IT-CC-7.3

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  4. **List the steps required to resolve an automated security alert.** IT-CC-7.4

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  5. **Describe the six instance states, including pending, running, stopping, stopped, shutting down, and terminated.** IT-CC-7.5

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  6. **Diagram the transitions between instance states from launch to termination.** IT-CC-7.6

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  7. **Explain instance usage billing for each instance state.** IT-CC-7.7
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**8. Determine the optimal instance state for a given situation.** IT-CC-7.8

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**Create a cloud environment that is scalable.** IT-CC-8

**1. Recall the process for setting up a static website.** IT-CC-8.1

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**2. Compare static and dynamic websites.** IT-CC-8.2

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**3. Create a content delivery network distribution to increase the speed of your website. Upload to online career portfolio.** IT-CC-8.3

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**4. Use a process to launch a dynamic web server.** IT-CC-8.4

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**5. Create a serverless compute function using a serverless compute console. Upload to online career portfolio.** IT-CC-8.5

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**6. Describe the main functions of auto scaling.** IT-CC-8.6

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**7. Create a launch template and an auto scaling group.** IT-CC-8.7

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**8. Develop a plan for monitoring an auto scaling instance or group. Upload to online career portfolio.** IT-CC-8.8

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**Integrate emerging technologies into a cloud computing environment.** IT-CC-9

**1. Recognize capabilities of artificial intelligence (AI) and analyze the ethical implications.** IT-CC-9.1

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**2. Identify an AI product that would help address a need or problem in a given situation.** IT-CC-9.2

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**3. Appraise the value of emerging AI technology.** IT-CC-9.3

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**4. Determine cases where machine learning (ML) could be used.** IT-CC-9.4

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**5. Explain how machine learning can help address a need or problem in a given situation.** IT-CC-9.5

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**6. Create a machine learning algorithm. Upload to online career portfolio.** IT-CC-9.6

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**7. Evaluate how AI and ML support deep learning.** IT-CC-9.7

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**8. Evaluate how AI and ML support enterprise and business intelligence.** IT-CC-9.8

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**9. Define Internet of Things (IoT) and explain its relationship to cloud technology.** IT-CC-9.9

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**10. Explain how IoT products or services can address a given need or problem.** IT-CC-9.10

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**11. Explain the concept of infrastructure as code (IaC), such as AWS CloudFormation, Azure Resource Manager, and others.** IT-CC-9.11

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**12. Examine a template which uses an IaC tool to determine the configuration of services.** IT-CC-9.12

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**13. Develop a template using an IaC tool that addresses a given user need. Upload to online career portfolio.** IT-CC-9.13

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**Demonstrate the safe and effective use of big data, including cryptocurrency.** IT-CC-10

**1. Define big data and identify cases where it would be used (use case) in various industries.** IT-CC-10.1

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**2. Evaluate pros and cons of big data.** IT-CC-10.2

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**3. Explain how blockchain ensures the validity and immutability of transactions, particularly in the cloud.** IT-CC-10.3

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**4. Evaluate the pros and cons of blockchain business applications.** IT-CC-10.4

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**Organize personal online career portfolio for specific career interests.** IT-CC-11

**1. Review and update résumé to reflect new knowledge and skills master and additional work experience.** IT-CC-11.1

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**2. Organize folders within the portfolio to reflect specific careers of interest, including résumé, targeted cover letter, and artifacts relevant to the specific career.** IT-CC-11.2

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**3. Update all current items in the portfolio.** IT-CC-11.3

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**4. Identify and upload additional industry-appropriate artifacts reflective of mastered skills throughout this course.** IT-CC-11.4

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**5. Polish all entries in the online career portfolio to ensure accuracy and professionalism as expected from employers.** IT-CC-11.5

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**6. Conduct a job search and share the appropriate folder with the potential employer.** IT-CC-11.6

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**Explore how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, entrepreneurship development, and competitive events.** IT-CC-12

**1. Explain the goals, mission, and objectives of Future Business Leaders of America (FBLA) and/or Technology Student Association (TSA) and/or SkillsUSA.** IT-CC-12.1

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**2. Explore the impact and opportunities a student organization (FBLA, TSA, SkillsUSA) can develop to bring business and education together in a positive working relationship through innovative leadership and career development programs.** IT-CC-12.2

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**3. Explore the local, state, and national opportunities available to students through participation in related student organizations (FBLA, TSA, SkillsUSA) including but not limited to conferences, competitions, community service, philanthropy, and other student organization activities.** IT-CC-12.3

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**4. Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.** [IT-CC-12.4](#)

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**5. Explore the competitive events related to the content of this course and the required competencies, skills, and knowledge for each related event for individual, team, and chapter competitions.** [IT-CC-12.5](#)