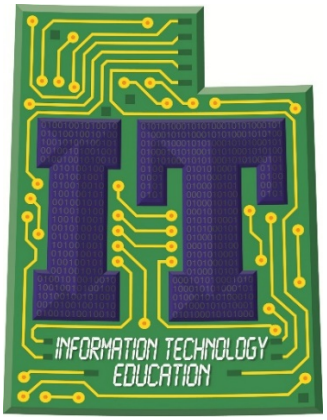
STRANDS AND STANDARDS
CLOUD COMPUTING



Course Description

Understanding cloud technologies tops the list of most important skills for any developer, system administrator or network computing professional seeking a lucrative career in technology. However, getting started and researching all things related to cloud infrastructure technologies can be complicated and time-consuming. This course maps out the entire cloud landscape and explains how various tools and platforms fit together.

This course gives you a primer on cloud computing and the use of open source software to maximize development and operations.

Intended Grade Level	9-12
Units of Credit	0.5
Core Code	35.02.00.00.042
Concurrent Enrollment Core Code	35.02.00.13.042
Prerequisite	None
Skill Certification Test Number	
Test Weight	0.0
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Computer Science Level 2
Endorsement 2	Network+
Endorsement 3	Web Development

STRAND 1

The Basics of Cloud Computing

Standard 1

Virtualization

- KVM
- VirtualBox
- Vagrant

Standard 2

Infrastructure as a Service (IaaS)

- Amazon EC2
- Azure Virtual Machine
- DigitalOcean
- Google Compute Engine
- OpenStack

Standard 3

Platform as a Service (PaaS)

- Cloud Foundry
- Openshift
- The Heroku Platform

Performance Skills

Explain how different components of cloud computing work together.

STRAND 2

Why Containers are becoming mainstream – Project Moby

Standard 1

Micro OSes for Containers

- Atomic Host and Red Hat CoreOS
- VMWare Photon
- RancherOS

Standard 2

Container Orchestration

- Docker Swarm
- Kubernetes
- Deploying Containers with Mesos
- Nomad by HashiCorp
- Kubernetes Hosted Solutions
- Amazon ECS

Standard 3
Unikernels

Standard 4
Microservices

Standard 5
Software-Defined Networking and Networking for Containers.

- Software-Defined Networking (SDN)
- Networking for Containers
- Docker Single-Host Networking
- Docker Multi-Host Networking
- Docker Network Driver Plugins
- Kubernetes Networking
- Cloud Foundry: Container to Container Networking

Standard 6
Software-Defined Storage and Storage Management for Containers.

- Ceph
- GlusterFS
- Storage Management for Containers
- Volume Plugins for Docker
- Volume Management in Kubernetes
- Container Storage Interface (CSI)
- Cloud Foundry Volume Service

Performance Skills
Explain why the container technology is becoming mainstream.

STRAND 3
DevOps and Continuous Integration/Continuous Deployment (CI/CD)

Standard 1
Introduction and Learning Objectives

- CI/CD: Jenkins
- CI/CD: Travis CI
- CI/CD Shippable
- CI/CD: Concourse
- Cloud Native CI/CD

Standard 2
Tools for Cloud Infrastructure 1 (Configuration Management)

- Ansible
- Puppet

- Chef
- Salt Open

Standard 3

Tools for Cloud Infrastructure 2 (Build and Release).

- Terraform
- BOSH

Standard 4

Tools for Cloud Infrastructure 4 (Key – Value Pair Store).

- etcd
- Consul

Standard 5

Tools for Cloud Infrastructure 5 (Image Building).

- Building Docker Images
- Packer

Standard 6

Tools for Cloud Infrastructure 6 (Debugging, Logging, and Monitoring for Containerized Applications).

- Sysdig
- cAdvisor and Heapster
- Fluentd
- Datadog
- Prometheus

Performance Skills

- Explain DevOps and Continuous Integration/Continuous Deployment (CI/CD).
- Deploy applications with just one click.
- Differentiate between and use various tools for cloud infrastructure technology.

STRAND 4

The skill set required to meet business needs with modern cloud computing technologies and the challenges associated with the adoption of the cloud.

Standard 1

Features and Implementation of Service Mash

- Envoy
- Istio
- Linkerd

Standard 2

Internet of Things.

Standard 3

Serverless Computing

- AWS Lambda
- Google Cloud Functions
- Azure Functions
- Serverless and Containers

Standard 4

OpenTracing - Jaeger

Standard

How to Be Successful in the Cloud

- Developing Skills and Challenges

Performance Skills

- Describe the skill set required to meet business needs with modern cloud computing technologies.
- Discuss the challenges associated with the adoption of the cloud.

Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Standard				Total Points	Total Questions
		1	2	3	4		
Cloud Computing	8##	10	9	6	12	56	37
Industry Exam	9##						