

Glendale Unified School District

High School

August 13, 2019

*Revised Course Outline Board Approved February 15, 2022*

Department: Career Technical Education

Course Title: Information Technology and Cloud Computing Foundations Honors  
*(formerly Information Systems and Information Technology Essentials 1-2)*

Course Code: 5144V/5145V

Grade Level(s): 10-12

School(s)  
Course Offered: Clark Magnet High School

UC/CSU Approved  
(Y/N, Subject): Y, "g" College Prep Elective

Course Credits: 10

Prerequisite: Tech Lit

Recommended  
Textbook: CompTIA A+ Certification All-in-One Exam Guide, Tenth Edition,  
McGraw-Hill Education, 2019, 978-1260454031

CompTIA Cloud+ Study Guide: Exam CV0-003, 3rd Edition, Wiley, 2021,  
ISBN: 978-1119810957

Course Overview: This course covers the hands-on foundations of Information Technology and Cloud Computing. The course topics for Information Technology include computer and software configuration, installation, diagnostics, networking, security, and professional responsibilities of an Information Technology professional. The course topics for Cloud Computing include Cloud Computing Fundamentals, Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Security for Cloud, Cloud Business Continuity, Availability, and Legal Compliance. Student will design, implement, test, and validate a small and medium business environment on lab pods in the classroom and on Cloud Services. This

course provides preparation for students to take the CompTIA A+ or the TestOut PC Pro and the CompTIA Cloud+ certification exams.

For High Schools: Most importantly, use the unit and key assignment descriptions to demonstrate that the curriculum meets the a-g course criteria. Courses are to be academically challenging, involving substantial reading, writing, problems and laboratory work (as appropriate), and show serious attention to analytical thinking, factual content and developing students' oral and listening skills, this is the criteria UC analysts use to review courses for "a-g" approval.

### **Course Content-First Semester**

#### **Unit 1: Computer Hardware**

*(4 weeks)*

#### **STANDARDS**

Information Support and Services Pathway Standards A2.0, A2.1, A2.2, A2.3, A2.4

Common Core State Standards (RSIT 12.3, WS 11-12.6, 9)

- A. The topics covered in this unit include CPU's, RAM, BIOS/UEFI, Motherboard, Power Supplies, Hard drives/SSDs, and Troubleshooting Techniques. Each component in this unit will be covered in depth, including diagnostics procedures for each component and correct installation methods. The students will have labs on the topic and will learn the components in a hands-on way. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA A+ Exam or the TestOut PC Pro Exam. The students will be able to describe and apply the topics covered in this unit.
  
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of sourcing and troubleshooting hardware. Students will write a research paper on the various Computer Hardware failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

#### **Unit 2: Networking and Printers**

*(4 weeks)*

#### **STANDARDS**

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include networking technologies, networking protocols, LAN's, WAN's, WLAN's, the internet, and the organizational impact. The students will learn about these technologies, and their applications via hands on labs. The students will discuss and diagnose common networking problems and determine the appropriate corrective actions. The students will cover the various printer technologies including Inkjet, Laser and Thermal. The students will learn about the configuration methods for each type in a modern organization and troubleshooting techniques. Students will be accessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA A+ Exam or the TestOut PC Pro Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of Networking for small and medium sized businesses. Students will write a research paper on the various Networking failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 3: **Operating Systems**

*(5 weeks)*

STANDARDS

Information Support and Services Pathway Standards A4.1, A4.2, A4.1, A6.1, A6.2, A6.3, A6.4, A6.5, A6.6.

Common Core State Standards (RSIT 12.1,2,3. WS 11-12.6,7,8,9)

- A. The topics covered in this unit will include installing and upgrading operating systems, maintaining, and optimizing Operating systems. Other topics include learning about the Command Line Interface (CLI), creation of users and groups, common troubleshooting techniques for issues and problems on Windows and Linux. All the Operating System components will be covered and their common problems and troubleshooting techniques using labs. Students will be accessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA A+ Exam or the TestOut PC Pro Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of installing or deploying an Operating System in an Enterprise Business Environment. Students will write a research paper on the various Operating System Deployment failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 4: **Security**

(3 weeks)

STANDARDS

Information Support and Services Pathway Standards A5.1, A5.2, A5.3, A5.4

Networking Pathway Standards B8.1, B8.2, B8.3, B8.4, B8.5

Common Core State Standards (RSIT 11-12.1,2,3,5, WS 11-12.6,7,8.)

- A. The topics covered in this unit include Security Concepts and Technologies, Network Design Techniques for Security and Analyzing threats for a modern network. Other topics covered in this unit include least access privileges, firewall, routers and intrusion detection and response devices. Students will research best practices used in industry to implement proper security techniques and analyzing threats. The students will learn about each topic from course lectures and will implement this knowledge via labs. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA A+ Exam or the TestOut PC Pro Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of securing small and medium sized businesses. Students will write a research paper on the various Security failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 5: **Digital and Mobile Forensics**

(2 weeks)

STANDARDS

Information Support and Services Pathway Standards A1.1, A1.2

Common Core State Standards (RSIT 12.2,3,7, WS 11-12.4,5,6,7,8,9)

- A. The topics covered in this unit include the proper techniques, laws, and procedures that are involved in Digital and Mobile Forensics. This will also cover Forensics report writing and appearing in court to testify regarding the outcomes of the forensics investigations. Student will learn about the various aspects of Digital and Mobile Forensics via lectures, research projects and hands-on labs. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA A+ Exam or the TestOut PC Pro Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of Digital Forensics tools in an Enterprise Environment. Students will write a

research paper on the various Digital Forensics failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 6: **Mobile Devices and Virtualization**

(2 weeks)

STANDARDS

Information Support and Services Pathway Standards A1.1.

Networking Pathway Standards B4.1, B4.4, B6.1, B6.3.

Common Core State Standards (RSIT 12.2,3,7, WS 11-12.4,5,6,7,8,9)

- A. This unit's topics includes coverage of mobile devices including Smart Phones, Tablets, etc. Also included are Virtualization topics which will include the hypervisors, and cloud-based systems. These topics will be covered via lecture, research papers, discussions, and labs. Students will be assessed on the topics via quizzes and exams. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA A+ Exam or the TestOut PC Pro Exam. The students will be able to describe and apply the topics covered in this unit. A comprehensive final exam will be required incorporating all aspect of the course to determine mastery and multiple culminating Lab projects will be assigned and assessed for mastery.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of managing Mobile Devices in an Enterprise Environment. Students will write a research paper on the various Virtualization failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

**Course Content-Second Semester**

Unit 1: **Cloud Computing Fundamentals**

(3 weeks)

STANDARDS

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include cloud computing fundamentals including the benefits and issues, types of clouds, compliance models and best practices for various business use cases. Each component in this unit will be covered in depth, including diagnostics procedures for each component and correct setup methods. The students will

have labs on the topic and will learn the components in a hands-on way. Students will be accessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA Cloud+ Exam. The students will be able to describe and apply the topics covered in this unit.

- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of Cloud Computing applications to modern business. Students will write a research paper on the various Cloud Computing failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 2: **Software as a Service (SaaS)**

*(3 weeks)*

STANDARDS

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include the various business uses for the Software as a Service Cloud Computing model including implementation, compliance, cost, and availability expectations. The students will learn about these technologies, and their applications via hands on labs. The students will discuss and diagnose common Software as a Service problems and determine the appropriate corrective actions. Students will be accessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA Cloud+ Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of Software as a Service Cloud Computing applications to modern business. Students will write a research paper on the various Software as a Service Cloud Computing failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 3: **Platform as a Service (PaaS)**

*(3 weeks)*

STANDARDS

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include the various business uses for the Platform as a Service Cloud Computing model including implementation, compliance, cost, use in development applications, and availability expectations. The students will learn about these technologies, and their applications via hands on labs. The students will discuss and diagnose common Platform as a Service problems and determine the appropriate corrective actions. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA Cloud+ Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of Platform as a Service Cloud Computing applications to modern business. Students will write a research paper on the various Platform as a Service Computing failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 4: **Infrastructure as a Service (IaaS)**

*(3 weeks)*

STANDARDS

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include the various business uses for the Infrastructure as a Service Cloud Computing model including business requirements, design, implementation, compliance, cost, hybrid cloud, and availability expectations. The students will learn about these technologies, and their applications via hands on labs. The students will discuss and diagnose common Infrastructure as a Service problems and determine the appropriate corrective actions. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA Cloud+ Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of Infrastructure as a Service Cloud Computing applications to modern business. Students will write a research paper on the various Infrastructure as a Service Computing failures and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 5: **Security for Cloud**

(3 weeks)

STANDARDS

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include the application of security to all aspects of cloud and business operations for Cloud Computing including training for security, security design, security testing, cost of cloud security tools and services, and hybrid cloud options for security. The students will learn about these technologies, and their applications via hands on labs. The students will discuss and diagnose common Cloud Security problems and determine the appropriate corrective actions. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA Cloud+ Exam. The students will be able to describe and apply the topics covered in this unit.
- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of secure implementation of Cloud Computing applications to modern business. Students will write a research paper on the various security failures for Cloud Computing and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

Unit 6: **Cloud Business Continuity, Availability, and Legal Compliance**

(5 weeks)

STANDARDS

Networking Pathway Standards B2.1, B2.2, B2.3, B3.1, B3.2, B3.3, B3.4, B3.5, B3.6, B3.7, B4.1, B4.5, B6.1, B7.2, B7.3.

Common Core State Standards (RSIT 12.3, WS 11-12.2,3,4,5,6,7,8)

- A. The topics covered in this unit include the application of cloud computing business continuity, cloud availability, and legal compliance for cloud environments including managing cloud risk, preparing process and procedures to maintain business continuity and responsibilities of the leading staff, and maintaining legal compliance for various business operations on the cloud. The students will learn about these technologies, and their applications via projects. The students will discuss and diagnose common Cloud Security compliance and availability problems and determine the appropriate corrective actions. Students will be assessed on the topics via a quiz and exam. The standards for these assessments will be based on industry standards and the CompTIA Cloud+ Exam. The students will be able to describe and apply the topics covered in this unit.



- B. Each unit will have a respective lab that will test students' knowledge on the topics and where each student will produce a lab report. Students will research regarding the best practices of business continuity and availability implementation of Cloud Computing applications to modern business. Students will write a research paper on the various legal compliance failures for Cloud Computing and provide recommendations to fix these failures based on referenced best practices. Each unit will also have a quiz and will be covered in the exams that will assess the student's retention of the topics covered in the lecture and discussions.

### **Final Exam / Project**

Student will design, implement, test, and validate a small and medium business environment on lab pods in the classroom and on Cloud Services (Amazon Web Services (AWS)). Student will be expected to maintain a high uptime and maintain a secure, safe, and practical environment as a work-based learning team experience. The final exam for the courses will be the TestOut PC Pro industry recognized certification and project based exam for Cloud Computing.