CNIT R142: COMPTIA A+ TECHNICIAN AND CERTIFICATION PREPARATION

Originator
alynch

College
Oxnard College

Discipline (CB01A)
CNIT - Computer Networking/IT

Course Number (CB01B)
R142

Course Title (CB02)
CompTIA A+ Technician and Certification Preparation

Banner/Short Title
CompTIA A+ Technician

Credit Type
Credit

Start Term
Fall 2021

Formerly
ENGT R142

Catalog Course Description
This course provides instruction and hands-on training in the areas of hardware installation, software configuration, diagnostics and troubleshooting, preventative maintenance, basic networking, basic security, wireless, and operating systems including Microsoft Windows, Android, and Apple OS X. Students will also receive instruction on safety and environmental considerations as it relates to computing environments. In addition, this course prepares students for the CompTIA A+ certification exam. Oxnard College is a CompTIA Authorized Partner Program which entitles our students to significant discounts on CompTIA certification vouchers.

Taxonomy of Programs (TOP) Code (CB03)
0708.10 - *Computer Networking

Course Credit Status (CB04)
D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)
B (Transferable to CSU only)

Course Basic Skills Status (CB08)
N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)
C - Clearly Occupational

Course Cooperative Work Experience Education Status (CB10)
N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
Y - Not Applicable

Support Course Status (CB26)
N - Course is not a support course

Field trips
May be required

Grading method
Letter Graded

Alternate grading methods
Credit by exam, license, etc.

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Is this course part of a family?
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
52.5
Maximum Contact/In-Class Lecture Hours
52.5

Activity

Laboratory
Minimum Contact/In-Class Laboratory Hours
52.5
Maximum Contact/In-Class Laboratory Hours
52.5

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
105
Total Maximum Contact/In-Class Hours
105

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
105
Maximum Outside-of-Class Hours
105

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
210
Total Maximum Student Learning Hours
210

Minimum Units (CB07)
4
Maximum Units (CB06)
4

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	Correctly identify the components of a PC system including the motherboard, CPU, RAM, CMOS, hard drive, video card, power supply, CD/DVD Drive, and related ports and adapter slots.
2	List the minimum system requirements when presented with an operating system such as Windows 7, Windows 8/8.1, or Windows 10. Minimum system requirements that students are expected to know are the RAM, CPU speed, hard disk space, and video card requirements.
3	Gather and list IPv4 and IPv6 addressing information on a host PC utilizing the proper TCP/IP command. Information will include IP addressing, subnet mask, gateway, DHCP server, DNS server.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	Install and identify PC components.
2	Identify issues related to supporting and troubleshooting laptops and portable devices.
3	Define the key differences between operating systems and minimum resource requirements between the operating systems.
4	Configure and troubleshoot issues related to printers and scanners.
5	Describe basic computer networking concepts related to protocols, addressing, bandwidth, networking devices, and troubleshooting techniques.

6	Identify the characteristics of hardware and software security including physical security, encryption, and protection from viruses and other malicious attacks.
7	List the aspects and importance of safety and environmental issues when working on a PC and around electricity.
8	Summarize good communication skills when dealing with customers including listening, speaking clearly, and writing trouble tickets.
9	Configure, troubleshoot, and optimize the Windows, Android, and Apple OS X operating systems.
10	List the frequencies, available channels, and bandwidths of the various 802.11 WLAN standards.

Course Content

Lecture/Course Content

1. PC Components.
   a. Motherboards
   b. CPU and chipsets
   c. BIOS, CMOS, firmware
   d. Hard drive
   e. RAM
   f. Peripherals including keyboard, mouse, and USB jump drives
   g. Power Supply
2. Laptops and Portable Devices
   a. Form factors such as size, memory, and hard drive
   b. Communication connections
   c. Input devices and pointing devices
   d. Power management
   e. Expansion slots and ports
   f. Peripherals including docking station and port replicator
3. Operating Systems
   a. Microsoft Windows, OS X, Android, Unix, and Linux variants
   b. Evolution of operating systems and interoperability issues
   c. Graphic user interface vs command line interface
   d. System requirements and support features
   e. Disks, file systems, and directory structures of the various operating systems
   f. Advantages and disadvantages of each operating system
4. Printers and Scanners
   a. Types of printers and scanners including laser, inkjet, thermal, solid ink, and impact
   b. Printer and scanner components including memory, firmware, driver, toner, ink cartridge, paper
   c. Printer and scanner ports including USB, serial, parallel, firewire, bluetooth, wireless, SCSI, and NIC based
   d. Configuration, troubleshooting, and support of printers and scanners
5. Computer Networking Concepts
   a. Protocols such as TCP/IP, DHCP, DNS, PING, TRACERT, IPCONFIG
   b. IPv4 and IPv6 addressing
   c. LAN and WAN concepts
   d. Network devices including cable, hubs, switches, and routers
   e. Tools and diagnostic procedures for troubleshooting networks
6. Hardware and Software Security
   a. Malicious software protection
   b. Authentication technologies including passwords, biometrics, and smart cards
   c. Wireless encryption and wireless security
   d. Backups and securing high end networking devices such as servers and routers
   e. Preventative maintenance
7. Safety and Environmental Issues
   a. Selecting appropriate repair tools and electrical safety guidelines
   b. Material safety data sheets and documentation
   c. Environmental considerations including heat, dust, and power issues such as spikes, sags, and blackouts
   d. Proper disposal procedures for batteries, display devices, and electronic equipment
8. Communication and Soft Skills

a. Communication strategies with the customer
b. Strategies to avoid confrontations with the customer
c. Documenting PC issues in a trouble ticket
d. Best practices for telephone, email, and in-person communication with the customer

Laboratory or Activity Content

1. Build a PC
   a. Open case
   b. Install power supply
   c. Install motherboard
   d. Install RAM
   e. Install hard drive
   f. Connect peripheral devices
   g. Power up and test PC
2. Install Operating System
   a. Windows 7
   b. Windows 8/8.1
   c. Windows 10
   d. Ubuntu
3. Configure Operating System Settings
   a. User accounts and passwords
   b. File and folder permissions
   c. File and folder sharing
   d. Group policy settings
4. Computing Device Maintenance
   a. OS updates
   b. Software updates
   c. Driver issues
   d. Disk drive optimization
   e. Grounding strap to prevent ESD
   f. Utilization of PC maintenance hand tools
   g. Compressed air to prevent dust buildup
5. Networking
   a. Wired networking
   b. Wireless networking
   c. Bluetooth
   d. Hub, switch, router, and access-poing (AP)
   e. Cabling
   f. Wired and wireless network interface cards
6. Printers
   a. Connecting printer
   b. Device manager to verify printer operation
   c. Selecting driver
   d. Test print
   e. Adjusting printer settings
   f. Troubleshooting printer issues
7. Security
   a. Antivirus solutions
   b. Configuring Windows Firewall
   c. Windows Update to patch OS with latest security updates
   d. Software vendor websites to patch 3rd party applications with most recent security updates
   e. Encrypting files, folders, and hard drive with NTFS/EFS and BitLocker
   f. Locking down settings with Group Policy

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):
Problem solving exercises

Skills demonstrations
Written expression

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Computational homework
Essays
Group projects
Individual projects
Laboratory activities
Laboratory reports
Objective exams
Projects
Problem-Solving Assignments
Problem-solving exams
Quizzes
Reports/papers
Research papers
Skill tests
Simulations

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Audio-visual presentations
Collaborative group work
Class activities
Class discussions
Distance Education
Demonstrations
Group discussions
Guest speakers
Instructor-guided use of technology
Internet research
Laboratory activities
Lecture
Small group activities

Describe specific examples of the methods the instructor will use:

1. Instructor will use publisher-provided PowerPoints to lecture on CompTIA A+ course topics.
2. The instructor will introduce labs and demonstrate lab solutions where appropriate.
3. The instructor may summarize current IT events or trends in the IT industry and ask students questions regarding the information that was shared.
4. Small group activities related to researching and reporting out recently released computing devices and the operating systems associated with the computing devices.
5. The instructor will illustrate some of the more challenging multiple-choice questions and performance-based questions that students may experience on the CompTIA A+ certification.

Representative Course Assignments

Writing Assignments

1. Students are required to write reports on their analysis of articles they are assigned to read on specific websites that cover topics such as troubleshooting hardware and software.
2. Students will summarize research from manufacturer support websites on issues relating to firmware upgrades, driver issues, hotfixes, service packs, and malware.

Critical Thinking Assignments

1. Evaluation of a security vulnerability to a specific operating system and specific written recommendations to mitigate the risk.
2. Students will evaluate the technology needs of a fictitious company and determine a solution that best meets the needs of the customer. For example, a company is supporting an increasing number of remote workers and they need help determining an appropriate VPN solution that balances cost, security, and performance. It is up to the student to make a specific VPN recommendation and justify the recommendation to meet the needs of the fictitious company.

Reading Assignments

1. Students are required to read and study the information in the assigned chapter of the courseware on specific CompTIA A+ topics.
2. Students are required to perform reading from assigned support websites such as www.microsoft.com, www.apple.com, www.sans.org, and www.techbuyersguru.com.

Skills Demonstrations

1. Students will properly cable and configure a LAN, harden the network devices with the proper configuration, and implement an IP addressing scheme using DHCP.
2. Students will perform a wireless site survey to determine interference issues, appropriate 802.11 standard to implement based on the wireless computing devices available, channel selection, speed, and the appropriate WLAN layered security to implement.

Other assignments (if applicable)

1. In order to be prepared for the CompTIA A+ Certification, students will be required to answer certification preparation questions from publisher resources.
2. Students will take a simulated certification preparation exam to help ensure their readiness for the actual CompTIA A+ Certification.

Outside Assignments

Representative Outside Assignments

1. Students will be required to read the assigned A+ curriculum to be properly prepared for the lecture, class activities, and lab activities.
2. Students need to complete simulated labs from the courseware as part of their grade in the class and to be properly prepared for the CompTIA A+ certification at the end of the semester.
3. Students will be assigned A+ certification prep questions and perofmrance-based simulated labs that will help prepare them for success on the final exam and the CompTIA A+ certification.

Articulation

C-ID Descriptor Number

ITIS 110

Status

Submitted to C-ID

Comparable Courses within the VCCCD

CNSE M06 - Fundamentals of IT Essentials

Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
Santa Barbara CIty College	CNEE 102	Computers and Network Support	4

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Software

Description
PC Pro Courseware, TestOut, 2019, ISBN: 978-1-935080-42-8
*This courseware is imported into the Canvas course shell and it includes the curriculum, labs, and exams.

Resource Type
Other Instructional Materials

Description
Vendor websites such as www.dell.com, www.ubuntu.com, www.microsoft.com, www.apple.com, and www.android.com. Also, security websites such as www.sans.org and www.US-CERT.gov.

Distance Education Addendum

Definitions

Distance Education Modalities

Hybrid (51%–99% online)
Hybrid (1%–50% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

Regular Effective/Substantive Contact

Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Topics will be presented for discussion with the opportunity to provide commentary and feedback on fellow student responses.
E-mail	Email will be used for individual interaction between professor and student, to send group email reminders of deadlines, to inform of upcoming course content.
Face to Face (by student request; cannot be required)	Face to face with students will take place at student request to discuss specific questions, issues, or concerns.
Video Conferencing	Zoom or comparable video conferencing software to lecture on course content, demonstrate lab assignments, answer student questions in real time, and provide student assistance on anything that is course related.
Other DE (e.g., recorded lectures)	Any real-time instruction will be recorded and available to students through the LMS.

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Topics will be presented for discussion with the opportunity to provide commentary and feedback on fellow student responses.
E-mail	Email will be used for individual interaction between professor and student, to send group email reminders of deadlines, to inform of upcoming course content.
Face to Face (by student request; cannot be required)	Face to face with students will take place at student request to discuss specific questions, issues, or concerns.
Video Conferencing	Zoom or comparable video conferencing software to lecture on course content, demonstrate lab assignments, answer student questions in real time, and provide student assistance on anything that is course related.
Other DE (e.g., recorded lectures)	Any real-time instruction will be recorded and available to students through the LMS.

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Topics will be presented for discussion with the opportunity to provide commentary and feedback on fellow student responses.
E-mail	Email will be used for individual interaction between professor and student, to send group email reminders of deadlines, to inform of upcoming course content.
Video Conferencing	Zoom or comparable video conferencing software will be utilized to lecture on course content, demonstrate lab assignments, answer student questions in real time, and provide student assistance on anything that is course related.
Other DE (e.g., recorded lectures)	Any real-time instruction will be recorded and available to students through the LMS.

Examinations

Hybrid (1%–50% online) Modality
Online
On campus

Hybrid (51%–99% online) Modality
Online
On campus

Primary Minimum Qualification
COMPUTER INFORMATION SYS

Additional local certifications required
CompTIA A+ Certification

Review and Approval Dates

Department Chair
08/21/2020

Dean
08/21/2020

Technical Review
08/26/2020

Curriculum Committee
08/26/2020

Curriculum Committee
11/25/2020

CCCCO
MM/DD/YYYY

Control Number
CCC000266548

DOE/accreditation approval date
MM/DD/YYYY