

C S 56B: IT ESSENTIALS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	4.5
Hours:	4 lecture, 2 laboratory per week (72 total per quarter)
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- A successful student will be able to explain the key features and use of laptop computers
- A successful student will be able to install and describe the purpose of a PC operating system

Description

The course presents a working knowledge of computer internals and provides practical skills in computer hardware assembly and software installation. Emphasis is placed on troubleshooting problems throughout the process. Activities include hands-on labs and virtual learning tools which encourage critical thinking and complex problem-solving skills.

Course Objectives

The student will be able to:

- A. Understand the basics of the information technology (IT) industry.
1. Demonstrate the skills and knowledge necessary to pass the CompTIA A+ certification exam.
 2. Understand the skills required for entry-level IT positions such as enterprise technician, IT administrator, field service technician, PC technician, remote support technician, help desk technician, call center technician, IT specialist, and IT representative.
 3. Understand the process to become A+ Certified.
- B. Demonstrate and understanding of basic PC safety principles.
- C. Perform assembly and disassembly of personal computers.
- D. Explain the concepts underlying preventative maintenance.
- E. Explain the purpose of a PC operating system.
- F. Understand basic networking concepts.
- G. Explain the key features and use of laptop computers.
- H. Demonstrate an understanding of mobile device and their uses.
- I. Install, upgrade, repair, configure, optimize, troubleshoot, and perform preventative maintenance of printers.
- J. Explain the basics of cybersecurity.
- K. Demonstrate an understanding of professionalism in IT.
- L. Understand the need for advanced troubleshooting skills.

Course Content

- A. Introduction to the personal computer
1. IT industry certifications
 2. Career opportunities
 3. The importance of fundamentals

- B. Lab procedures and tool use
1. Purpose of safe working conditions and procedures
 2. Tools and software used with personal computer components and their purposes
- C. Computer assembly - step by step
- D. Overview of preventative maintenance and troubleshooting
1. Explain the purpose of preventative maintenance
- E. Operating systems
1. Purpose of an operating system
 2. Operating systems purpose, limitations, and compatibilities
- F. Networks
1. Principles of networking
 2. Types of networks
 3. Basic networking concepts and technologies
 4. Physical components of a network
 5. LAN topologies and architectures
 6. Standards organizations
 7. Ethernet standards
 8. OSI and TCP/IP data models
 9. Switches and routers
 10. Names, purposes, and characteristics of other technologies used to establish connectivity
 11. Common preventive maintenance techniques used for networks
- G. Laptops
1. Laptop components
 2. Laptop display components
 3. Laptop power
 4. Laptop docking stations
 5. Laptop wireless communication technologies
 6. Laptop durability
 7. Common preventive maintenance techniques for laptops
 8. Basic troubleshooting for laptops
- H. Mobile devices
1. Mobile device hardware overview
 2. Mobile device operating systems
 3. Network connectivity and email
 4. Methods for securing mobile devices
 5. Basic troubleshooting for mobile devices
- I. Printers
1. Common printer features
 2. Types of printers
 3. Installing and configuring printers
 4. Sharing printers
 5. Preventive maintenance techniques for printers
 6. Basic troubleshooting for printers
- J. Security
1. Security threats
 2. Security procedures
 3. Common preventive maintenance techniques for security
- K. The IT professional
1. Communication skills and the IT professional
 2. Ethical and legal issues in the IT industry
 3. Call center technicians
- L. Advanced troubleshooting
1. Diagnose and resolve advanced hardware and software problems
 2. Computer components and peripherals
 3. Operating systems
 4. Networks
 5. Laptops
 6. Printers
 7. Security

Lab Content

A. Introduction IT essentials labs

1. Explore job opportunities
2. Use Ohm's Law
3. Research computer components
4. Build a specialized computer system

B. Basic testing methodology

1. Using a multimeter and a power supply tester
2. Test UTP cables using a loopback plug and a cable meter
3. Practice computer disassembly and assembly

C. Hardware installation

1. Install the power supply
2. Install the motherboard
3. Install the drives
4. Install adapter cards
5. Install internal cables
6. Install front panel cables
7. Complete the computer assembly
8. Boot the computer

D. OS installation data migration, the registry, virtual memory, device

1. Perform data migration in Windows systems
2. Install Windows systems
3. Check for updates in Windows systems
4. Perform registry backup and recovery in Windows systems
5. Create a partition in Windows systems
6. Use Task Manager (managing processes) in Windows systems
7. Install third-party software in Windows systems
8. Create user accounts in Windows systems
9. Configure browser settings in Windows systems
10. Manage virtual memory in Windows systems
11. Manage device drivers with Device Manager in Windows systems
12. Set regional and language options in Windows systems
13. Monitor and manage system resources in Windows systems
14. Perform hard drive maintenance in Windows systems
15. Managing system files with built-in utilities in Windows systems
16. Use Remote Desktop and Remote Assistance in Windows systems
17. Work with CLI commands in Windows
18. Run line utilities in Windows systems
19. Install a desktop virtualization program
20. Manage the Startup Folder in Windows systems
21. Schedule a task using the GUI and the at command in systems
22. Use the System Restore tool in Windows systems

E. Networking, NICs, DHCP, protocols, cables, wireless, file sharing and drive mapping, ISP connection

1. Configure a NIC to use DHCP in Windows systems
2. Build straight-through and crossover UTP cables
3. Install a wireless NIC in Windows systems
4. Connect to a SOHO router for the first time
5. Configure wireless router in Windows systems
6. Share a folder, create a homegroup and map a network drive in a Windows system

F. Laptops, ACPI, RAM, batteries, screens, hard drives

1. Research docking stations
2. Match ACPI standards
3. Explore laptop RAM
4. Explore laptop batteries
5. Explore laptop screens
6. Explore laptop hard drives
7. Build a specialized laptop

8. Research laptop problems

9. Gather information from the customer
10. Investigate support websites and repair companies

G. Mobile devices, Android OS, iOS

1. Work with Android
2. Work with iOS
3. Become familiar with mobile device features - Android and iOS
4. Configure mobile Wi-Fi - Android and iOS
5. Understand passcode locks - Android and iOS

6. Troubleshoot mobile devices

H. Printers, installation, sharing

1. Install a printer in Windows
2. Share a printer in Windows systems

I. Security

1. Securing account data and the computer in Windows systems
2. Configure wireless security
3. Data backup and recovery in Windows system
4. Configure a Windows Firewall

J. Customers and customer service

1. Consider the management of technician resources
2. Control the call
3. Discuss customer types
4. Discuss customer privacy

K. Troubleshoot hardware and software problems

1. Repair a boot problem
2. Remote technician - repair boot problem
3. Troubleshoot hardware problems in Windows systems
4. Fix an operating system problem
5. Remote technician - fix an operating system problem
6. Troubleshoot operating system problems in Windows systems
7. Fix a network problem
8. Troubleshoot network problems in a Windows system
9. Fix a laptop problem
10. Remote technician - fix a laptop problem
11. Troubleshoot laptop problems in a Windows system
12. Fix a printer problem
13. Fix a printer problem remotely
14. Troubleshoot printer problems in Windows systems
15. Fix a security problem locally
16. Fix a security problem as a remote technician
17. Troubleshoot access security in a Windows system

Special Facilities and/or Equipment

- A. Access to a network laboratory with current Cisco network equipment host computers required to support the class.
- B. A website or course management system with an assignment posting component (through which all lab assignments are to be submitted) and a forum component (where students can discuss course material and receive help from the instructor). This applies to all sections, including on-campus (i.e., face-to-face) offerings.
- C. When taught via Foothill Global Access on the Internet, the college will provide a fully functional and maintained course management system through which the instructor and students can interact.
- D. When taught via Foothill Global Access on the Internet, students must have currently existing email accounts and ongoing access to computers with internet capabilities.

Method(s) of Evaluation

- Tests and quizzes
- Written laboratory assignments

Final examination

Method(s) of Instruction

Lectures which include motivation for the architecture of the specific topics being discussed

In-person or online labs (for all sections, including those meeting face-to-face/on campus), consisting of:

1. An assignment webpage located on a college-hosted course management system or other department-approved internet environment. Here, the students will review the specification of each assignment and submit their completed lab work
2. A discussion webpage located on a college-hosted course management system or other department-approved internet environment. Here, students can request assistance from the instructor and interact publicly with other class members

Detailed review of laboratory assignments which includes model solutions and specific comments on the student submissions

In-person or online discussion which engages students and instructor in an ongoing dialog pertaining to all aspects of designing, implementing and analyzing programs

When course is taught fully online:

1. Instructor-authored lecture materials, handouts, syllabus, assignments, tests, and other relevant course material will be delivered through a college-hosted course management system or other department-approved internet environment
2. Additional instructional guidelines for this course are listed in the attached addendum of CS department online practices

Representative Text(s) and Other Materials

Cisco Networking Academy. IT Essentials Companion Guide, 17th ed. 2020.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

A. Reading

1. Textbook assigned reading averaging 30 pages per week.
2. Online curriculum averaging 20 pages per week.
3. Online resources as directed by instructor though links pertinent to networking.
4. Library and reference material directed by instructor through course handouts.

B. Writing

1. Technical prose documentation that supports and describes the laboratory exercises that are submitted for grades.

Discipline(s)

Computer Science