

CNIT R101: IT ESSENTIALS

Originator

alynch

College

Oxnard College

Discipline (CB01A)

CNIT - Computer Networking/IT

Course Number (CB01B)

R101

Course Title (CB02)

IT Essentials

Banner/Short Title

IT Essentials

Credit Type

Credit

Start Term

Fall 2021

Formerly

ENGT R150

Catalog Course Description

This course is a technical introduction to computing devices and the operating systems they run. Additional course topics include the essentials of computer networks, wireless networking, cybersecurity, and printers. This course also covers soft skill topics such as customer service and communication. Students will gain a solid foundation in information technology that will help prepare them for entry-level positions in IT as well as the more advanced computer networking courses in the CNIT program.

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)

A (Transferable to both UC and CSU)

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

43.75

Maximum Contact/In-Class Lecture Hours

43.75

Activity

Laboratory

Minimum Contact/In-Class Laboratory Hours

26.25

Maximum Contact/In-Class Laboratory Hours

26.25

Total in-Class

Total in-Class

Total Minimum Contact/In-Class Hours

70

Total Maximum Contact/In-Class Hours

70

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class

Minimum Outside-of-Class Hours

87.5

Maximum Outside-of-Class Hours

87.5

Total Student Learning

Total Student Learning

Total Minimum Student Learning Hours

157.5

Total Maximum Student Learning Hours

157.5

Minimum Units (CB07)

3

Maximum Units (CB06)

3

Student Learning Outcomes (CSLOs)

Upon satisfactory completion of the course, students will be able to:

- | | |
|---|--|
| 1 | Identify the main components of a personal computer including the CPU, RAM, hard drive, network interface card, CMOS, BIOS, and specific expansion slots. |
| 2 | Demonstrate the ability to build a functional PC using a simulator. Steps include the following: Installing the motherboard onto the case, adding the power supply, and installing all of the components onto the motherboard that are necessary to create a functional PC that can be connected to a network. |
| 3 | Demonstrate the proper use of TCP/IP utilities to gather configuration information including the IP address, subnet mask, gateway, DNS as well as the commands necessary to check for network connectivity between host devices such as ping and tracert. |

Course Objectives

Upon satisfactory completion of the course, students will be able to:

- | | |
|---|--|
| 1 | Explain the importance of computer literacy in the workplace. |
| 2 | List and define the main components of a personal computer. |
| 3 | Demonstrate the ability to communicate through the Internet using email, instant messaging, and discussion boards. |
| 4 | Describe the difference between application software and operating system software. |
| 5 | Summarize the difference between proprietary software and open source software. |
| 6 | Describe the differing characteristics between a peer-to-peer network and a client/server network. |

- 7 Create a functional Ethernet and wireless network using a network virtualization program.
- 8 Analyze methods to protect a PC and computer network and make recommendations about a security solution for a small network.
- 9 List the different type of communications media that are currently popular and summarize the advantages and disadvantages of each.
- 10 Demonstrate the ability to use a bottom-up, layered approach to troubleshooting the most common PC and computer networking problems.
- 11 List the different types of wide area networks (WANs) of an Internet service provider (ISP) and summarize the advantages and disadvantages of each.
- 12 Describe tools used for computerservice and explain how to use those tools safely.
- 13 Describe the differences between printers used for small office/home office and enterprise networks.
- 14 List and describe the most common wireless security protocols.
- 15 Compare and contrast the most popular mobile operating systems currently in the market.

Course Content

Lecture/Course Content

1. Computer Literacy
 - a. Careers and computer literacy
 - b. Internet of things (IoT)
2. Personal Computer Components
 - a. Power supply, RAM, CPU, motherboard, system bus, video card
 - b. Case and ports
 - c. Peripherals
 - d. Setting up a PC
 - e. Ergonomics
3. Internet
 - a. Origin of the Internet
 - b. Web browsers
 - c. Search engines and techniques
 - d. Third party plugins
 - e. Connecting to the Internet and choosing an ISP
 - f. Chat, blogs, webcasts, e-mail, podcasts, and VoIP
 - g. Social networking websites
4. Application Software and the Operating System
 - a. Types of application productivity software
 - b. Types of multimedia and entertainment software
 - c. Operating systems
 - d. Proprietary versus open source software
 - e. Software updates and patches
5. Computer Networking
 - a. Advantages of networking
 - b. Peer-to-peer versus client/server networking
 - c. Components of a network
 - d. Ethernet and TCP/IP
 - e. Wireless networking
6. PC and Computer Network Security
 - a. PC and network threats
 - b. Malware types
 - c. Firewalls and anti-virus solutions
 - d. Updating and patching the OS and applications

- e. Social engineering, spam, phishing, ransomware, password cracking
 - f. Next generation anti-virus and firewalls
7. Networking Media and Standards
 - a. Coaxial, copper, fiber, 802.11 wireless, and Bluetooth
 - b. Classes of cable and connectors
 - c. IEEE networking standards
 8. Troubleshooting
 - a. Open system interconnection (OSI) model
 - b. Troubleshooting using a bottom-up approach
 - c. Help resources
 - d. Documentation during the troubleshooting process
 9. Wide Area Networks (WANs)
 - a. Cable
 - b. DSL and dial-up
 - c. T1, T3, and optical carrier networks
 - d. FIOS
 - e. Satellite
 - f. Cellular networks: 3G, 4G/LTE, 5G
 - g. Internet Service Providers
 10. Mobile Devices
 - a. Smartphones
 - b. Tablets
 - c. Laptops
 11. Soft skills
 - a. Work order
 - b. Trouble ticket and documentation
 - c. Customer communication
 - d. Teamwork
 12. Operating systems
 - a. Windows 10
 - b. Apple Mac OS X
 - c. Android
 - d. iOS

Laboratory or Activity Content

1. Computer Assembly
 - a. Open the case and install the power supply
 - b. Install the motherboard
 - c. Install RAM
 - d. Install the drives
 - e. Install the adapter cards
 - f. Install internal cables
 - g. Close case and connect peripherals
 - h. Boot and test PC
2. Install Windows Operating System
 - a. Partition and format hard drive
 - b. Install Windows OS
 - c. Answer setup questions using a script
 - d. Update Windows OS using Windows Update
3. Create an Ethernet Network
 - a. Create an Ethernet network using a star topology
 - b. Connect host PCs to an Ethernet switch
 - c. Select the appropriate Ethernet cable
 - d. Connect to the appropriate network card

- e. Configure IP address, subnet mask, and gateway for each host
 - f. Verify connectivity using ping command
4. Create a Wireless Network
 - a. Create an 802.11 wireless network using an access point and wireless clients
 - b. Configure access point with appropriate SSID and WPAII encryption key
 - c. Configure wireless clients with the SSID and WPAII encryption key
 - d. Verify connectivity between wireless clients and access point with the ping command
 5. Troubleshoot Network
 - a. Troubleshoot a network problem using the OSI Model in a bottom-up approach
 - b. Document troubleshooting process starting with Layer 1 (Physical Layer) up to higher layers of the OSI Model until the problem has been solved
 - c. Demonstrate the proper use of TCP/IP utilities such as ipconfig, tracert, ping, nslookup, etc. during troubleshooting
 - d. Test and document solution
 6. Anti-Virus Software
 - a. Download an AV software suite
 - b. Update AV with latest definitions
 - c. Setup automatic scanning
 - d. Run scan and document results
 - e. Research and summarize the difference between next generation AV software and current AV software that is based on signature definitions
 7. Configure Host Based Firewall
 - a. Block specific applications
 - b. Permit and block specific ports
 - c. Allow exceptions through the firewall
 - d. Verify and test firewall configuration
 8. Printer
 - a. Connect a host to a printer
 - b. Configure driver
 - c. Configure printer for network connectivity using IP address
 - d. Configure different print options
 - e. Verify proper operation of printer
 9. Mobile Operating Systems
 - a. Mobile device features
 - b. Android configuration options
 - c. iOS configuration options
 - d. Passcode locks
 - e. Mobile WiFi configuration
 - f. Saving data in the cloud

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
 Oral presentations
 Problem-Solving Assignments
 Problem-solving exams
 Quizzes
 Reports/papers
 Skills demonstrations

Skill tests

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

Audio-visual presentations
 Computer-aided 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 PowerPoints provided by the publisher to lecture on chapter IT Essentials topics.
2. The instructor will introduce labs and also at times, demonstrate the lab solution.
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. The instructor will form small groups and have each group research a specific cybersecurity threat. The group will collaborate with one another and create a short presentation to present to the class that summarizes the cybersecurity threat and the group will explain the best approach to mitigate the risk of the threat. Along the way the instructor will point out best practices for an effective presentation which addresses soft skills development.

Representative Course Assignments**Writing Assignments**

1. Students will be required to complete written assignments summarizing technology and making recommendations given a scenario. An example would be identifying the different types of WAN connections that an ISP provides and recommending a solution for a company with specific Internet needs.
2. Students will be required to write a paper identifying security threats to a PC and computer network and recommend best practices for a home or small business.
3. Students will be required to research social networking websites and summarize potential productivity benefits of these sites and security and privacy concerns.

Critical Thinking Assignments

1. Evaluation of a cybersecurity vulnerability 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 has certain wireless networking requirements as it relates to speed, range, and security and the student needs to determine the appropriate IEEE 802.11 standard to implement and WLAN security needs. The student will need to justify their selection when multiple approaches may satisfy the customer needs.

Reading Assignments

1. Reading of the IT Essentials course curriculum
2. Completion of embedded lab activities in the curriculum
3. Viewing multimedia using links embedded in the IT Essentials curriculum
4. Completion of certification preparation exams at cisco.netacad.com and www.comptia.org (<http://www.comptia.org>).

Skills Demonstrations

1. Students will demonstrate the ability to configure host based security by hardening the device as specified in a lab assignment.
2. Students will demonstrate the ability to make an Ethernet cable using the appropriate cabling tools in a lab activity.

Other assignments (if applicable)

1. Students will have the opportunity to build and test networks utilizing a virtualization program developed by the Cisco Networking Academy called Packet Tracer.

Outside Assignments

Representative Outside Assignments

1. Reading the IT Essentials curriculum.
2. Completing virtual lab activities that are embedded in the curriculum.
3. Visit vendor websites to view and read about the latest computing device hardware and software.
4. Visit network security related websites such as www.sans.org to learn about the latest cybersecurity threats and how to mitigate against these threats.

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

Textbook

Description

Cisco Press, *IT Essentials Course Booklet, 7th Edition*, 2019

Resource Type

Manual

Description

Cisco Press, *IT Essentials Lab Manual, 7th Edition, 2019*

Resource Type

Other Instructional Materials

Description

Online articles on applications; operating system websites; update and patch review at software websites; cybersecurity current event websites

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 feedback, present and answer questions.
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)	Part of the course requires face to face time. Also, face to face with individuals will take place 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 feedback, present and answer questions.

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)	Part of the course requires face to face time. Also, face to face with individuals will take place 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 feedback, present and answer questions.
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 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

Primary Minimum Qualification

COMPUTER INFORMATION SYS

Review and Approval Dates**Department Chair**

08/21/2020

Dean

08/21/2020

Technical Review

8/26/2020

Curriculum Committee

8/26/2020

Curriculum Committee

11/25/2020

CCCCO

MM/DD/YYYY

Control Number

CCC000515928

DOE/accreditation approval date
MM/DD/YYYY