COURSE SYLLABUS

CCNA-1v7.0 – Introduction to Networks

CNT-140AA, Section 17429, Summer 2020, 4 Credit Hours

Mesa Community College - Network Academy

## Live Online format, 6:00–9:30pm Mon thru Thu, 5/26/20 – 6/25/20

Instructor: **Bob Samson** (CCNA, CISSP, CCAI, MCP, Net+, A+, HTI+)

Email address: robert.samson@mesacc.edu (preferred method of contact)

Telephone: 480-461-7744 - Daytime and message phone.

Office Hours: By appointment, typically 1 hour before class.

Department Chair: Angie Surber, angeline.surber@mesacc.edu, 480-461-7298

Textbooks: Introduction to Networks, Companion Guide (**Optional**)

ISBN Book: 9780136633662, eBook: 9780136633549

Introduction to Networks, Labs and Study Guide (**Optional**)

ISBN: 9780136634454

Online Multimedia: [www.netacad.com](http://www.netacad.com) (Curriculum and Testing)

Login Name / Password: /

MCC's Netlab: <https://netlab1.mesacc.edu>

Resource Matls: Packet Tracer v7.3 (available for free download)

USB Flash Drive (4-gig or more)

**COURSE DESCRIPTION:**

Focus on the architecture, structure, functions, components, and models of the Internet and other computer networks. Principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced. Students will build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. Preparation for Cisco certification examination.

**COURSE COMPETENCIES:**

Upon completing this course, the student will have demonstrated the ability to:

1. Describe the devices and services used to support communications in data networks and the Internet.
2. Describe the role of protocol layers in data networks.
3. Describe the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments.
4. Design subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks.
5. Explain fundamental Ethernet concepts such as media, services, and operations.
6. Build a simple Ethernet network using routers and switches.
7. Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations.
8. Utilize common network utilities to verify small network operations and analyze data traffic.

**Module Outline**

Module1: Networking Today

Networks affecting our lives, Components, Representations and Topologies, Network Types, Internet connections, Reliability, Trends, Security, The IT Professional

Module 2: Basic Switch Configuration

IOS Access, IOS navigation, Command Structure, Basic configuration, Save configurations,

Ports and addresses, Configure IP addressing, Verify connectivity

Module 3: Protocols and Models

Communication Rules, Protocols, Suites, Standards Organizations, Reference Models, Data encapsulation, Data access

Module 4: Physical Layer

Purpose, Characteristics, Copper cabling,

UTP cabling, Fiber-Optic cabling, Wireless Media

Module 5: Number Systems

Binary, Hexadecimal

Module 6: Data Link Layer

Purpose, Topologies, Data Link Frame

Module 7: Ethernet Switching

Ethernet Frames, MAC Address, MAC Address Table, Switch speeds and forwarding methods

Module 8: Network Layer

Characteristics, IPv4 Packet, IPv6 Packet,

How a host routes, Introduction to routing

Module 9: Address Resolution

MAC and IP, ARP, IPv6 Neighbor Discovery

Module 10: Basic Router Configuration

Initial settings, Interfaces, Default-Gateway

Module 11: IPv4 Addressing

IPv4 address structure, Unicast, Broadcast, Multicast, Types of IPv4 addresses,

Network segmentation, subnet an IPv4 network, subnet a /16 and /8, subnet to meet requirements, VLSM, Structured design

Module 12: IPv6 addressing

IPv4 issues, IPv6 addressing, IPv6 address types, GUA and LLA Static configuration,

Dynamic addressing for IPv6 GUAs and LLAs, IPv6 multicast addresses, subnet an IPv6 network

Module 13: ICMP

ICMP Messages, Ping and Traceroute testing

Module 14: Transport Layer

Transportation of data, TCP and UDP overview, Port numbers, TCP communication process, Reliability and flow control, UDP communication

Module 15: Application Layer

Application, Presentation, Session, Peer-to-peer, Web and Email protocols, IP addressing services, File sharing services

Module 16: Network Security Fundamentals

Network security threats and vulnerabilities, network attacks, Attack mitigation, Device security

Module 17: Build a Small Network

Devices in a small network,

Small network applications and protocols,

Scale to larger networks, Verify connectivity,

Host and IOS commands,

Troubleshooting methodologies and scenarios

CCNA-1 Case Study

1. IPv4 and IPv6 Addressing

2. Ethernet Cabling

3. Switch and Router Configuration

4. Troubleshooting

**STUDENT RESPONSIBILITIES:**

You are expected to spend at least 4 to 6 hours per week outside class on homework assignments and review materials via the Internet. Attend all class meetings and seek clarification to understand the concepts presented by completing all the course modules, asking questions, participating in class discussions and activities, and utilize available resources. Participation and completion of all labs is required and will be done in-groups during class time. Due to the nature of this class and its labs, assignments will be given on a week-by-week basis. Lab rules will be strictly adhered to for the safety of the student, to prevent damage to the equipment, and to avoid interference with other students.

Audio tape recording may be allowed as an accommodation if it’s not disruptive and the instructor is clearly notified each day and in advance of each such recording.

**ATTENDANCE:**

Due to the nature of the course, attendance at all class meetings is required and will directly affect your grade. Attendance records will be maintained. If you are late to a class or must leave early, it is your responsibility to make sure you are marked present for that date and obtain lecture notes/handouts! Classes begin promptly at the scheduled time. Breaks will be scheduled and class will resume promptly after the break. If a situation arises where the student cannot attend a class, it is the student’s responsibility to meet with the instructor regarding any makeup work. The instructor may withdraw a student from a class if they have accumulated unofficial absence hours in excess of 20% of the total classroom hours the class meets. Official absences are defined as those in which you are involved in an official activity of the college or could also mean prior approval obtained from the Instructor.

**WITHDRAWAL:**

For your own protection, do not stop attending this or any other course you might enroll in and ASSUME that your Instructor will discover this fact and withdraw you. If you wish to withdraw from this course, it is your responsibility to contact the Instructor and fill out the appropriate paperwork. Obtain forms for an official withdraw from the Records/Registration Office and follow the procedure in the catalog. Failure to officially withdraw can cause the loss of all fees and result in failing grades for all courses registered. Enrolled students who are not present for the first class will be dropped as having “never attended” (unless prior approval was received from the instructor).

**MCC Early Alert Program (EARS):**

Mesa Community College is committed to the success of all our students. Numerous campus support services are available throughout your academic journey to assist you in achieving your educational goals. MCC has adopted an Early Alert Referral System (EARS) as part of a student success initiative to aid students in their educational pursuits. Faculty and Staff participate by alerting and referring students to campus services for added support. Students may receive a follow up call from various campus services as a result of being referred to EARS. Students are encouraged to participate, but these services are optional. Early Alert Web Page with Campus Resource Information can be located at: http://www.mesacc.edu/students/ears.

**GENERAL POLICIES:**

Information for Students with Disabilities: If you have a documented disability, including a learning disability, and would like to discuss possible accommodations, please contact the MCC Disabilities Resources and Services Office at [480-461-7447](tel:480-461-7447) or email [drsfrontdesk@mesacc.edu](mailto:drsfrontdesk@mesacc.edu).

Students with disabilities must have an equally effective and equivalent educational opportunity as those students without disabilities. Students experiencing difficulty accessing course materials because of a disability are expected to contact the course instructor so that a solution can be found that provides all students equal access to course materials and technology.

Information for Pregnant or Parenting Students: If you are a pregnant or parenting student you are protected under Title IX regarding classroom accommodations. Please request your accommodations through the MCC Disabilities Resources and Services Office at [480-461-7447](tel:480-461-7447) or email [drsfrontdesk@mesacc.edu](mailto:drsfrontdesk@mesacc.edu).

District policy prohibits smoking, food or drink in the classroom. Smoking is not allowed anywhere on Maricopa Community College District property, this includes electronic cigarette substitutes.

You are encouraged to read and fully familiarize yourself with the Mesa Community College catalog. You are to pay close attention to the requirements and policies of the catalog, either stated or implied, as they relate to this campus and this course. The operations of both are completely governed by the statements therein. If more than one policy applies in a given situation, the more restrictive one will be used.

The Maricopa Community College District and this instructor do not discriminate on the basis of race, color, national origin, sex, handicap or age in application, admission, participation, access and treatment of persons in instructional or employment programs and activities. Student diversity in the classroom will be utilized as part of the learning experience.

This syllabus/outline may be subject to additions, deletions and/or changes at the discretion of the instructor or Maricopa Community College District. The course content may vary from this outline to meet the needs of this particular group. Advance notice of such change shall be given.

**COPYRIGHT LAW - LEGAL & SCHOLASTIC CONSEQUENCES:**

Notice/Warning: It is against Federal copyright law to make copies of textbooks and software without specific permission of the copyright holder. We are required to report all violations, and we will. Any such violations may also carry serious consequences toward your grade in this class up to and including a failing grade for this course, regardless of scholastic performance. During this course students will come in contact with a considerable amount of copyrighted information, including, without limitation, on-line assessment exams.

**GRADING:**

A large percentage of this course is computer-based training and therefore attendance and completion of all modules is key to obtaining a good grade. There will be class labs/activities, assessment exams and a Final exam. Final grades will be submitted no later than ten working days from completion of the last class. Student performance will be evaluated as follows:

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| --- | --- |
| Grading Percentages | |
| Participation (example: Attendance) | 10 |
| Labs / CYU completion | 25 |
| Module Group Exams (6 total) | 10 |
| Mid-Term Exam (Packet Tracer Activity) | 10 |
| Case Study (Packet Tracer Activity) | 15 |
| Skills Based Final (Packet Tracer Activity) | 15 |
| Final Exam (online multiple choice) | 10 |
| Quizzes | 5 |
| **Total** | **100** |

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| --- | --- | --- | --- | --- | --- |
| GRADE | A | B | C | D | F |
| % | >= 90% | 80-89% | 70-79% | 60-69% | <60% |

**NOTE: Students must take both the Skills Final and Cisco Final Exams to pass this class.**

* **Participation** is based on being in class entire time. Leaving early or arriving late is subject to deductions. Do not underestimate the importance of attending all classes.
* **Case Study:** The case study is intended to help students apply the skills learned in the class to a real-world problem. Students will be assigned a scenario and will be required to produce deliverables equivalent to the work a professional consulting firm might provide given the same scenario.
* **Quizzes** will be given randomly, typically at the beginning of class, covering material from the previous class session(s).
* **Chapter Exams** are taken online via the Cisco Exam site.
* The **Skills Based Final** will be an individual effort to demonstrate your proficiency in applying the concepts learned in class. Class notes will be available during the skill based final exam for reference purposes.
* **Labs/Activities**: While labs may be done in teams and may vary depending on class progress, the results will be submitted individually. The goal is to complete each lab successfully and then be able to document what happened in the lab.

\*Lab grading may be based on different criteria; however each lab should be completed and turned in by the due date for the lab. Points may be deducted for late submissions.

* **Final Assessment Exam**: Possession of any reference material during an exam, not expressly permitted by the Instructor (if any), or any other form of cheating or attempts at cheating, may result in a loss of all points for that exam.

**Class Schedule - Subject to change based on class progress.**

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| --- | --- | --- | --- |
| MONTH | Day | Sess # | **TOPIC** |
| May | 26 | 1 | Introduction to class: Syllabus; log in procedures; Accessing the on-line curriculum; Resources at MCC’s site  Module 1: Networking Today (51 slides, no video) |
| 27 | 2 | Module 2: Basic Switch Config (48 slides, 21 min video) |
| 28 | 3 | Module 3: Protocols and Models (56 slides, 4 min video) **PT quiz** on Basic Switch Configuration [Open Book] |
| Jun | 1 | 4 | Module 4: Physical Layer (34 slides, no video)Module 5: Number Systems (16 slides, no video)**PT quiz** on Basic Switch Configuration [Closed Book] |
| 2 | 5 | Module 6: Data Link Layer (21 slides, no video)Module 7: Ethernet Switching (29 slides, no video) |
| 3 | 6 | Module 8: Network Layer (33 slides, 6 min video)**Quiz** on Modules 3-6 (OSI Model; Physical & Datalink)Mid-Term prep |
| 4 | 7 | Module 9: Address Resolution (18 slides, no video)Module 10: Basic Router Configuration (22 slides, no video)**PT quiz** on Basic Switch & Router Configuration [Open Book]Case Study introduced [Packet Tracer – Open book] |
| 8 | 8 | **Mid-Term** Exam [Packet Tracer – Open book, in class] |
| 9 | 9 | Module 11: IPv4 Addressing (48 slides, 42 min video)**PT quiz** on Basic Switch & Router Configuration [Closed Book] |
| 10 | 10 | Module 12: IPv6 addressing (43 slides, no video)Module 13: ICMP (20 slides, no video) |
| 11 | 11 | Module 14: Transport Layer (46 slides, no video)Module 15: Application Layer (31 slides, no video)**Quiz** on Modules 11 & 12 (IP addressing) |
| 15 | 12 | Module 16: Network Security Fundamentals (26 slides, no video)Module 17: Build a Small Network (49 slides, no video) |
| 16 | 13 | Lab day; Finish Case-StudySkills-Final prep |
| 17 | 14 | **Skills Final Exam**- [Packet Tracer – Open book – in class] |
| 18 | 15 | Case Study due  All labs and assignments due  **Final Exam** and Course Feedback [in class] |
|  |  |  |

**Basic Configuration of a Switch or Router**

!

Switch> enable

Switch# configure terminal

!

Switch(config)# hostname S1

S1(config)# service password-encryption

S1(config)# security passwords min-length 5

S1(config)# login block-for 60 attempts 3 within 60

S1(config)# enable secret class

S1(config)# no ip domain-lookup

S1(config)# banner motd %Authorized Users only!%

!

S1(config)# line con 0 [note: this is a zero]

S1(config-line)# password cisco

S1(config-line)# login

S1(config-line)# logging synchronous

S1(config-line)# exec-timeout 0 0 [note: these are zeroes]

S1(config-line)# exit

!

S1(config)# line vty 0 15 [note: this is a zero; on a router use 0 4]

S1(config-line)# password cisco

S1(config-line)# login

S1(config-line)# logging synchronous

S1(config-line)# exec-timeout 0 0 [note: these are zeroes]

S1(config-line)# end

!

S1# copy running-config startup-config

S1#

**\*\*\* Additional Switch configuration for remote access\*\*\***

!

S1# configure terminal

!

S1(config)# interface vlan 1

S1(config-if)# description Remote management interface

S1(config-if)# ip address ?.?.?.? ?.?.?.?

S1(config-if)# no shutdown

s1(config-if)# exit

!

S1(config)# ip default-gateway ?.?.?.?

S1(config)# end

S1#