CSIS-202: CCNA 1 COMPUTER NETWORKS

Effective Term
Fall 2025

BOT Approval Date
01/16/2025

Discipline
CSIS - Computer Sci/Info Systems

Course Number
202

Course Title
CCNA 1 Computer Networks

Short Title
CCNA 1 Computer Networks

Credit Status (CB 04)
D - Credit - Degree applicable

Units

Lecture Units
3.00

Total Units
3.00

Hours

Lecture Contact Hours
48-54

Out of Class Hours Lecture
96-108

Total Contact Hours
48 - 54

Total Out of Class Hours
96 - 108

Total Student Learning Hours
144 - 162

Distance Education
Yes

Distance Education

Distance Education Type
Both Fully Online and Hybrid Online

Fully Online Delivery Requirements:
a. Students must be notified via the college schedule of classes and the syllabus for the class if proctored tests are required for this course
b. Any planned face-to-face meetings, such as an orientation or study session, must be optional

c. The MSJC curriculum committee requires the use of accessible, asynchronous discussion as a component of every fully online course

Are you using publisher content?

No

Regular Substantive Interaction

Instructor-to-student, student-to-student, and student-to-content contact shall be distributed in a manner that will ensure regular substantive interaction (RSI) is maintained not only weekly but also for the duration of the course. Instructor interactions should be equivalent in time, quality and consistency to the engagement students would receive in a face-to-face course—for example, through announcements, discussion participation, personalized feedback, video messages, or other instructional communications. Instructors are expected to be responsive to student inquiries within a 24-72 hour time frame excluding holidays. RSI will be maintained through a variety of methods: • Orientation - Students must be oriented to the online and face-to-face portions at the start of the course. • Announcements - Announcements using the course management system must be posted at least weekly to keep students current on course events, due dates, materials, etc. • Discussion Forums - Content-related discussion forums within the designated CMS will include appropriate instructor participation and will be initiated and maintained, with timely feedback provided. Instructors are required to monitor the discussions and related activities to provide guidance and direction. Open-ended discussion boards may be used to further learning and interaction. • MSJC Communication – Instructor will use MSJC-administered communication tools (such as email or the designated CMS communication tools) to regularly communicate with and provide ease of access to students. • Timely Feedback - Timely feedback on student work will be provided by the instructor, which may include comments and/or rubrics, within the Grades area of the designated CMS. • Scheduled Meetings – Hybrid and synchronous courses will meet at regularly scheduled times. ADA Compliance - All course interactions and content must be designed with accessibility in mind and meet ADA requirements.

Catalog Description

This course introduces students to the fundamentals of computer networking concepts including voice, data communications, networking hardware, the OSI model, and network design. Network management and security issues will also be discussed. This course is designed for the student who is interested in learning about data communications and networking, as well as, the career options that are available in this field.

Codes

TOP Code (CB 03)

0708.10* - *Computer Networking

CIP Code

11.0901 - Computer Systems Networking and Telecommunications.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Learning Objectives

Learning Objectives

Learning Objective
1. Assess network performance and security and propose methods for improvement.
2. Illustrate the devices and services used to support communications in data networks and the Internet.
3. Analyze the role of protocol layers in data networks.
4. Illustrate the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments.
5. Evaluate fundamental Ethernet concepts such as media, services, and operations.
6. Construct a simple Ethernet network using routers and switches.
7. Compose commands using the command line interface to perform basic router and switch configurations.
8. Analyze data traffic using common network utilities to verify operations on small networks.
9. Evaluate the potential impact of adopting inclusive language on creating a more welcoming and equitable environment for women in tech.

10. Evaluate biases and systemic inequalities within network infrastructure, and develop inclusive network technologies approaches that promote fairness and equal access to technological resources.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome
1. The student will identify internet models OSI ,TCP and their protocols.
2.The student will describe principles of subnetting.
3. The student will configure initial settings on a network device using the Cisco IOS software.
4. The student will configure switches and routers with device hardening features to enhance security.

Program Learning Outcomes

Learning Outcome
Research and apply industry reference models and best practices in order to improve process designs. Apply systems concepts in the investigation, evaluation, and resolution of information technology problems.

Institutional Learning Outcomes

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.
Information and Technology Literacy: The student will access, interpret, evaluate, and apply relevant information sources and digital media effectively, and in an ethical and legal manner.

Content

Course Lecture Content

1. Exploring the Network
 a.Networking Today LANs, WANs, and the Internet The Network Platform Providing Network Security
2.The Changing Network Environment
 a.Cisco Network Architecture
 b.Configuring a network
 c.Operating System
3.IOS Boot Camp
 a.Getting Basic Address Schemes
 b.Network Protocols and Communications
 c.Rules Of Communication
 d.Network Protocols and Standards
 e.Standards
 f.Organizations Moving Data
4.In The Network
 a.Network Access
 b.Physical Layer Protocols
 c.Network Media
 d.Data Link Layer Protocols
 f.Media Access Control
5.Ethernet
a.Ethernet Operation
 b.Address Resolution Protocol
 c.LAB
 d.Switches Network layer
 e.Network Layer Protocols
6.Routing

7.IP Addressing
a.IPv4 Network Addresses
b.IPv6 Network Addresses
c.Connectivity Verification
d.Testing And Verification
e.Subnetting IP Networks
f.Network Segmentation
g.Addressing Schemes
8.Design Considerations for IPv6
a.Application Layer
b.Application, Session, and Presentation Well
c.Known Application layer
d.Protocols Messages
9.Understanding Biased Terminology in Computer Networks
a. Analysis of Bias in Networking Terminology
b.Proposing Inclusive Solution
c.Reflecting on the Importance of Gender Inclusivity

Methods of Instruction

Method

In-class Exercises

Integration

Hands-on activities will be given that illustrate lecture principles and reading assignments with a focus on the construction of a simple Ethernet network using routers and switches, the command-line interface to perform basic router and switch configurations, and the analysis of data traffic using common network utilities. Teach students to be mindful of cultural differences when performing configurations, such as avoiding the use of culturally insensitive terminology in device names or network descriptions. This fosters an awareness of how language and practices in networking can impact inclusivity.

DE Adaptations for MOI

Hands-on activities will be facilitated through the course management system (CMS) using accessible video and audio capture software, allowing instructor demonstrations to be recorded and made available for all students. These recordings will include closed captioning and transcripts to ensure accessibility for diverse learners. Hands-on activities can also be supplemented with interactive software simulations, which will be integrated into the CMS, allowing students to engage in real-time practice. The CMS will provide a central platform for accessing these materials, ensuring that all students can participate fully, regardless of individual needs or time constraints.

Method

Lab Activities

Integration

Lab activities will be provided through a virtual environment in the Networking lab. Students will be provided remote access to work on such networking topics as performance, security, addressing schemes, media, services, and data operations.Introduce students to international networking standards and practices, highlighting how network configurations may vary across different regions due to legal, cultural, or technological factors. This global perspective prepares students to work effectively in a diverse, interconnected world.

DE Adaptations for MOI

Virtual labs and remote desktop access will be offered through the course management system (CMS), enabling online students to complete practical exercises and lab assignments from their own devices. To ensure accessibility, the CMS will provide step-by-step guides and video tutorials with closed captions and transcripts. These resources will support students in successfully completing tasks, regardless of their location or accessibility needs.

Method

Lecture

Integration

Lecture, with supporting visual materials (presentation or multimedia) will introduce conceptual and practical skills, such as network performance and security, the construction of a simple Ethernet network using routers and switches, and the proper use of the command-line interface to perform router and switch configurations.Ensure that all lecture materials use language that is inclusive and free from bias. Examples and analogies will be selected to resonate with a diverse student body, avoiding cultural references that may not be universally understood

DE Adaptations for MOI

Lectures will be delivered through the course management system (CMS) using video capture software that integrates voice narration with presentation slides. To ensure accessibility, closed captions and transcripts will be provided for all video content. The CMS will also be used to distribute additional lecture notes and sample materials, making all resources easily accessible to students, regardless of their needs or location.

Method

Discussion

Integration

Weekly discussion will be conducted as a means to compare and contrast various layers of data networks in IPv4 and IPv6 environments, evaluate fundamental Ethernet concepts, and the configuration of routers and switches.Discuss the importance of designing networks that are accessible to all users, including those with disabilities. This includes covering topics like adaptive technologies and ensuring that command-line interfaces are usable by individuals with varying levels of ability.

DE Adaptations for MOI

Weekly discussions will take place through the course management system (CMS), providing a structured platform for students to engage with course content and collaborate with peers. The discussion tool within the CMS will support accessibility features such as screen reader compatibility, adjustable text size, and keyboard navigation, ensuring all students can participate fully. Instructors will monitor discussions and provide feedback directly through the CMS, ensuring that all students receive timely and accessible input on their contributions.

Methods of Evaluation

Method

Exams/Tests

Integration

A Comprehensive final exam that measures each student's ability to synthesize and apply course concepts such as Internet architecture, structure, functions, components, and models; the use of OSI and TCP layered models; the nature and roles of protocols and services at the application, network, data link, and physical layers; principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations. Incorporate questions that encourage students to consider how networking concepts apply in different cultural, socioeconomic, or geographical contexts. For example, an exam question might ask how the principles of IP addressing and network design vary in developing countries versus developed nations, prompting students to apply DEI principles in their answers.The final exam will be evaluated based on the correct answer given.

DE Adaptations for MOE

The comprehensive final exam will be administered through the course management system (CMS) and will include a mix of multiple-choice, true/false, and short-answer questions. Students will submit their completed exams directly through the CMS. For multiple-choice and true/false questions, students will receive immediate feedback upon submission to reinforce learning. Feedback on short-answer questions will be provided within one week, offering detailed insights into performance and areas for improvement.

Method

Homework

Integration

Weekly networking assignments will be given that apply important concepts and skills to the student's experience outside the classroom. The focus might be on the role of protocol layers in data networks, the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments, or the construction of a simple Ethernet network using routers and switches. Homework will be evaluated based on correctness, completeness, and how well directions were followed. Assignments will include reflective components where students examine potential biases in networking practices. For instance, students might consider how the allocation of IP addresses can impact resource distribution among different regions or communities. Recognizing these biases helps students develop more equitable networking strategies.

DE Adaptations for MOE

Homework assignments will be submitted through the course management system (CMS) using the built-in assignment submission tool. To ensure accessibility, all assignment instructions and supporting materials will be provided in accessible formats, including screen reader compatibility and adjustable text options. Once assignments are submitted, students will receive feedback directly through the CMS grading tool. Instructors will provide detailed comments on correctness, completeness, and adherence to instructions. Feedback will be provided within one week of submission, ensuring timely responses and allowing students to track their progress and make improvements.

Method

Simulation

Integration

Weekly network simulation problems will be given that are designed to evaluate the students understanding of the construction of a simple Ethernet network using routers and switches; Ethernet concepts such as media, services, and operations; analysis of data traffic. Simulations will be evaluated based on correctness, completeness, and how well directions were followed.Students will be evaluated on configuring switches and router that requires instructor to individually help the student with labs and check the configurations in class. Assignments/Labs require troubleshooting the networking for each student often can take hours to do. Students will be encouraged to consider accessibility when designing network architectures. This includes accounting for users with disabilities by implementing features that support assistive technologies and ensuring that network interfaces are user-friendly for individuals with varying levels of technical expertise. For example, when working on addressing and naming schemes, students might explore methods that simplify network navigation for all users.

DE Adaptations for MOE

Weekly network simulation problems will be assigned and submitted through the course management system (CMS). Students will complete the simulations using interactive software provided within the CMS, which is fully accessible with screen reader support and adjustable interface settings. After completing the simulations, students will upload their results and any required documentation through the CMS. Instructors will review submissions and provide detailed feedback on performance and problem-solving approaches within one week. All feedback will be accessible through the CMS, allowing students to continuously improve their understanding and skills in a timely manner.

Assignments

Assignment Type

Writing

In-class and/or outside of class

In-class
Outside of class

Formative or Summative

Summative

Assignment

Overview:
In this guided activity, you will develop hands-on skills in subnetting, IP addressing, and router configuration. First, we will work together to explore the fundamental concepts, and then you will independently apply these concepts to solve a complex networking problem. By the end of this assignment, you will have gained practical experience with subnetting and router configuration, which are crucial for implementing and managing networks.
Instructions:

For this assignment, you will design and implement an IP addressing scheme for the network topology provided in the Topology Diagram. You will receive an address block that you must subnet to create a logical and efficient addressing scheme for the network. After creating the subnet, you will configure the routers to use the appropriate interface addresses. Once your configurations are complete, you will test the network to ensure it functions properly.
Steps:
Task 1: Subnet the Address Space
Subnet the provided address block according to the network's requirements.
Task 2: Determine Interface Addresses
Assign the correct IP addresses to the router interfaces based on your subnetting plan.
Task 3: Configure the Serial and FastEthernet Addresses
Configure the routers with the IP addresses you've assigned to their Serial and FastEthernet interfaces.
Task 4: Verify the Configurations
Test your configuration to ensure that the network is functioning as expected. This may involve using commands to check connectivity between devices and verifying the routing tables.
Task 5: Reflection
Document your process, including the challenges you faced and how you resolved them. Reflect on the network implementation and your approach to solving any issues that arose.

How assignment will be adapted in online format

For the subnetting and router configuration task, you will use the provided simulation tools to complete the tasks. You will submit your configuration files and reflection through the course management system (CMS). Feedback will be provided through the CMS within one week of submission. Constructive feedback will be offered to guide the continued learning of the student and help strengthen their problem-solving skills. Students seeking additional guidance or clarification can attend virtual office hours, which will provide timely and supportive feedback throughout the course.

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Background: In her article "It Starts with Words: Unconscious Bias in Gender, Race, and Class in Tech Terminology," Angeline Lee sheds light on how biased terminology in computer networks perpetuates stereotypes and excludes marginalized groups, particularly women. This assignment aims to analyze the impact of biased terminology on women in networking and propose inclusive solutions to address these issues.
1. Analyze Bias in Networking Terminology:
Critically analyze Angeline Lee's article, focusing on the impact of biased terminology on women in networking.
Identify specific examples of biased terms, and their implications for gender inclusivity.
Discuss how the use of such terminology reinforces stereotypes and creates a hostile environment for women in the networking field.

2. Propose Inclusive Solutions:
Based on your analysis, propose alternative, inclusive terminology for biased terms identified in networking.
Consider the feasibility and effectiveness of these proposed solutions in promoting gender inclusivity and diversity in the networking industry.
Discuss strategies for raising awareness and implementing inclusive language practices in networking discourse.
3. Reflect on the Importance of Gender Inclusivity:
Reflect on the importance of promoting gender inclusivity in networking terminology and the broader tech industry.
Discuss how biased terminology affects the participation and advancement of women in networking.
Consider the potential impact of adopting inclusive language on creating a more welcoming and equitable environment for women in tech.

Reading: "It Starts with Words: Unconscious Bias in Gender, Race, and Class in Tech Terminology" by Angeline Lee

Criteria for Evaluation: Grading and feedback by following criteria
1.Depth of analysis regarding the causes and implications of bias.
2.Feasibility and innovativeness of proposed solutions.

3.Clarity, coherence, and structure of the written assignment

How assignment will be adapted in online format

Here the assignment will be in the form of an online discussion board, students will have the opportunity to share their thoughts. The article will be available in the CMS(link or pdf) and the discussion board will be submitted via CMS. Feedback will be provided by grading the Discussion board via the CMS, and students will receive their feedback within one week of submission to ensure timely and constructive evaluation.

Course Materials

Textbooks

CCNA 200-301 Official Cert Guide Library, 2nd Edition
By Wendell Odom, David Hucaby, Jason Gooley
Published Jul 25, 2024 by Cisco Press.
ISBN-10: 0-13-822139-1
ISBN-13: 978-0-13-822139-3

Class Size Information

Class Size

35

Class Size Category

B - Facilitated learning 35

Diversity and Inclusion

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

The Computer Networks course embraces diversity and inclusion through a tapestry of strategies. This ensures every student feels valued and included, regardless of background. The curriculum showcases a rich variety of perspectives and examples. This fosters a welcoming learning environment where open discussions are encouraged, and all viewpoints are respected. Recognizing different learning styles and abilities, accessible resources are provided. Additionally, accommodations are made for students with disabilities. By highlighting diverse role models and cultural sensitivity, the course inspires students from all walks of life to pursue careers in computer networking. It equips them with the essential interpersonal and intercultural skills needed to thrive in today's globalized tech landscape. For example, Narinder S. Kapany contributed to computer networks by pioneering the concept of fiber optics, which laid the groundwork for the high-speed data transmission essential to modern networking infrastructure.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

Representation in course materials: The Computer Networks course goes beyond textbooks to showcase real-world experiences. We'll carefully pick case studies, pictures, and examples that reflect the rich diversity of the networking field. This means including people from various cultures, ethnicities, and socio-economic backgrounds. By seeing themselves reflected in the course material, every student will feel recognized and connected to the subject. This fosters a sense of belonging within the network engineering community, creating a positive learning environment where everyone thrives. For example the course content includes the following selections:
#Analysis of Bias in Networking Terminology
#Proposing Inclusive Solution
#Reflecting on the Importance of Gender Inclusivity

Real-world scenarios: The Computer Networks course takes you beyond theory with real-world projects that tackle diverse situations. You'll work on scenarios that reflect the variety of users and contexts in networking. This will show you firsthand why diversity and inclusion are crucial. By designing solutions for everyone, you'll create stronger, more secure networks.

Addressing bias and stereotypes: The Computer Networks course tackles the tough stuff: bias in networking. We'll explore how unconscious biases can impact system administration and network security. By openly discussing these issues, you'll learn to recognize your own biases and become champions for diversity and inclusion. This course equips you to build fairer, more secure networks in the real world.

Encouraging diverse perspectives: The Computer Networks course gets you working together in real ways. Through group discussions, projects, and feedback, you'll explore the field from different angles. This builds open-mindedness, empathy, and a rock-solid understanding of why diversity matters in network security and administration. By learning from each other, you'll not only solve complex challenges but also shape a more inclusive future for computer networking.

Cultivating an inclusive learning environment: The Computer Networks course is a safe space for open discussion. We'll set clear rules for respectful communication, and you'll always have ways to give anonymous feedback. This ensures everyone feels comfortable sharing their ideas without fear of judgment. In this inclusive environment, diverse perspectives can spark meaningful discussions and a deeper understanding of computer networks. By learning from each other, we'll build mutual respect and a more secure future for networks.

Interactions

Explain how the course will incorporate student-to-student interaction.

The course will incorporate student-to-student interaction through the subnetting and router configuration assignment by encouraging peer discussions and collaborative problem-solving. While working on the network configuration tasks, students can engage in virtual breakout rooms or discussion boards to exchange subnetting techniques, IP addressing strategies, and troubleshooting tips. This setup fosters a collaborative learning environment where students can support each other, sharing insights on effective approaches and common challenges. Online forums in the CMS will also be available for students to discuss their configurations, allowing for additional peer learning opportunities.

Explain how the course will incorporate instructor-to-student interaction.

Instructor-to-student interaction will be a key component of the subnetting and router configuration assignment. The instructor will provide initial guidance and a walkthrough of subnetting and router configuration basics before students begin the assignment independently. Once students submit their configuration files and reflection through the CMS, the instructor will provide detailed feedback, focusing on technical accuracy and problem-solving methods. Virtual office hours will also be available, where students can discuss their configurations, seek clarification on router setups, and receive one-on-one support as needed to successfully complete the assignment.

Explain how the course will incorporate student-to-content interaction.

The subnetting and router configuration assignment will deepen student-to-content interaction by guiding students through practical application of subnetting and IP addressing concepts. Using the provided simulation tools, students will design an IP addressing scheme, configure routers, and verify connectivity, allowing them to directly apply theoretical knowledge to hands-on tasks. This active engagement with course content helps solidify their understanding of subnetting and router configuration, and students will have access to supporting materials and practice resources on the CMS to strengthen their grasp of core networking concepts.

Explain how the course will incorporate student-to-self interaction (metacognitive).

The reflection component of the subnetting and router configuration assignment promotes student-to-self interaction by encouraging students to evaluate their approach to the configuration process. After completing their network setup, students will document the challenges they encountered, the strategies they used to resolve issues, and any insights they gained about network implementation. This self-reflective practice helps students assess their problem-solving skills and recognize areas for improvement, fostering metacognitive awareness as they track their progress in mastering subnetting and router configuration tasks.

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