Сүлжээний үндэс (Network Basics)

Class code: KCS414
Year Offering: 2025, 2nd Term
Target Grade Level: 4th Grade
Japanese Course Title: ネットワーク入門1,2
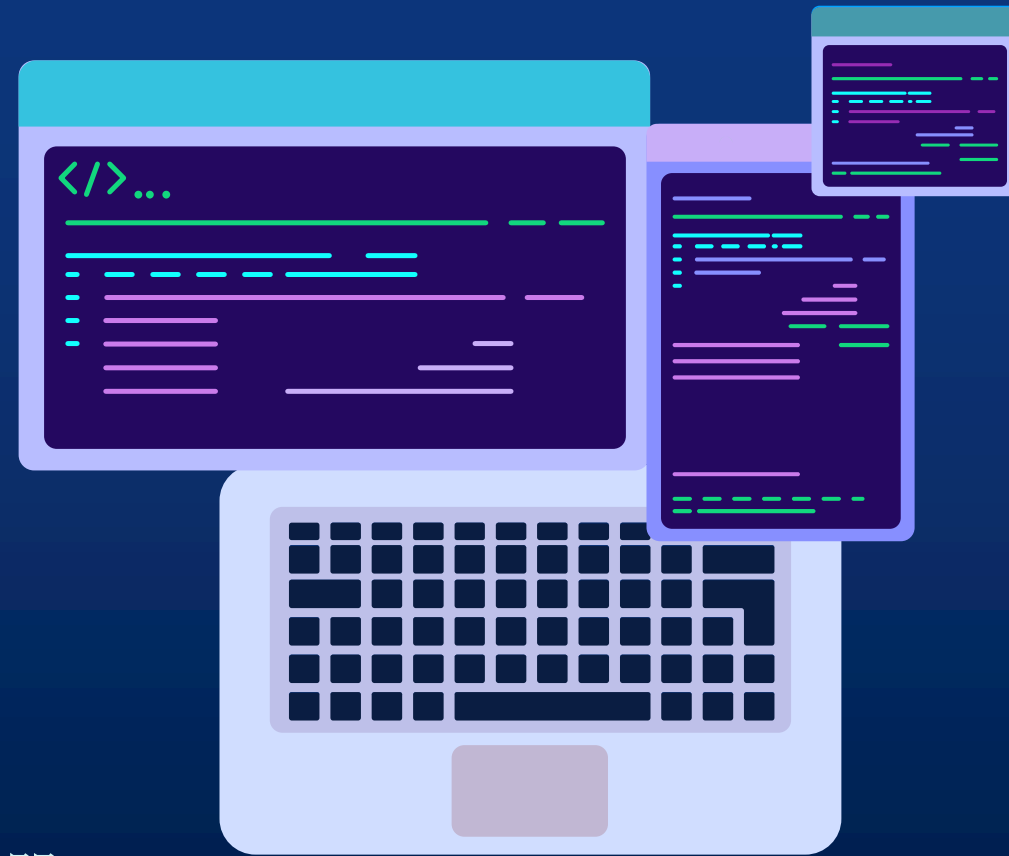
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COURSE OVERVIEW

Course materials

- Online Course: CISCO Networking Basics Course .

- Simulation tool: CISCO Packet Tracer. We do a lot of hands-on exercise.

- Textbook: "図解入門: TCP/IP"

Achievements

CISCO provides the Digital Badge

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CISCO Packet Tracer

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Communication in a Connected World

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Network Components, Types, and Connections

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Build a Home Network

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Communication Principles

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The Access Layer

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The Internet Protocol

08

IPv4 and Network Segmentation

09

中間試験

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Course Objectives

You will be able to perform the following tasks:

- Explain important concepts in network communication, network types, components, and connections.

- Explain the importance of standards and protocols in network communications.

- Explain how communication occurs on Ethernet networks.

- Explain the features of an IP address and IPv4 addresses are used in network communication.

- Explain features of IPv6 addressing.

- Explain how routers connect networks together.

- Use various tools to test and troubleshoot network connectivity.

- Configure an integrated wireless router and wireless client to connect securely to the internet.

コースの目標

コースを終了すると次のことができるようになります:

- ネットワーク通信、ネットワークの種類、構成要素、および接続に関する重要な概念を説明する。

- ネットワーク通信における標準とプロトコルの重要性を説明する。

- イーサネットネットワーク上で通信がどのように行われるかを説明する。

- IPアドレスの特徴と、IPv4アドレスがネットワーク通信でどのように使用されるかを説明する。

- ルーターがどのようにしてネットワークを接続するかを説明する。

- 様々なツールを使用してネットワーク接続をテストおよびトラブルシューティングする。

- 無線ルーターとコンピュータを設定して、インターネットに安全に接続する方法を学ぶ。

Course Plan 1-1

| Week	Date 2025	Class (80min)	Course Title	Course contents
1	1/23	1	• Course Overview • CISCO Packet Traer	Installation of Packet Tracer. Exercise: Using the Packet Tracer.
		2		
2	1/30	3	• Module 1: Communication in a Connected World	Network Types Data Transmission Bandwidth and Throughput Exercise: 1.1.4packet-tracer-create-realistic-structured-cablinginthe-physical-workspaceand-cabling-devices-ina-rack
		4		
3	2/6	5	• Module 2: Network Components, Types, and Connections	Clients and Servers Network Components ISP Connectivity Options Exercise: 1.1.6packet-tracer-connect-devicesusing-wireless-technologies
		6		
4	2/13	7	• Module 4: Build a Home Network Exercise with Packet Tracer	Home Network Basics Network Technologies in the Home Wireless Standards Exercise:Set Up a Home Router using Packet Tracer Exercise: 1.1.8packettracerexploredeviceconfigurationusingthecli
		8		

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Course Plan 1-2

Week	Date	Class	Course Title	Course contents
5	2/20	9	Module 5: Communication Principles	Communication Protocols Communication Standards Network Communication Models Exercise: 2.0.7packetrtacer-edittoplogies
		10		
6	3/6	11	Module 7: The Access Layer	Encapsulation and the Ethernet Frame The Access Layer Exercise: 2.1.1_packet_tracer_create_a_simple_network
		12		
7	3/13	13	Module 8: The Internet Protocol	Purpose of an IPv4 Address The IPv4 Address Structure Exercise: 2.1.3packettracermonitoryournetworkusinganetworkcontroll
		14		
8	3/20	15	Module 9: IPv4 and Network Segmentation	IPv4 Unicast, Broadcast, and Multicast Types of IPv4 Addresses Network Segmentation Exercise: Router in Cisco Packet Tracer.pkt
		16		

Course Plan 1-3

	Week	Class	Course Title	Course contents
9	3/24~ 3/28	17	中間試験	
		18		
10	4/3	19	Module 11: Dynamic Addressing with DHCP	Static and Dynamic Addressing DHCPv4 Configuration
		20		Exercise: Packet Tracer – Configure DHCP on a Wireless Router Exercise: Configuring a DHCP Server and Clients
11	4/10	21	Module 12: Gateways to Other Networks	Network Boundaries Network Address Translation
		22		Exercise: Packet Tracer – Examine NAT on a Wireless Router File: 10.2.3-packet-tracer---examine-nat-on-a-wireless-router.pka
12	4/17	23	Module 13: The ARP Process	MAC and IP Broadcast Containment
		24		Exercise: Packet Tracer – Identify MAC and IP Addresses file: 13.1.3-packet-tracer-identify-mac-and-ip-addresses.pka

Course Plan 1-4

Week	Date	Class	Course Title	Course contents
13	4/24	25	Module 14: Routing Between Networks	The Need for Routing The Routing Table Create a LAN Exercise: Packet Tracer – Create a LAN file: 14.3.3-packet-tracer-observe-traffic-flow-in-a-routed-network.pka file: 14.3.4-packet-tracer-create-lan.pka
		26		
14	5/1	27	Module 15: TCP and UDP	TCP and UDP Port Numbers Exercise: Packet Tracer – TCP and UDP Communications File:14.8.1 Packet Tracer – TCP and UDP Communications.pka
		28		
15	5/8	29	Module 16: Application Layer Services	The Client Server Relationship DNS, HTTP, FTP, Telnet, Email Exercise: Packet Tracer–Use FTP, Telnet and SSH File:16.5.3-packet-tracer---use-ftp-services.pka File: 16.6.4-packet-tracer---use-telnet-and-ssh.pka
		30		
16	5/15	31	Module 17: Network Testing Utilities	Troubleshooting Commands Exercise: Packet Tracer - Packet Tracer - Use the ping Command File: 17.1.3-packet-tracer---use-the-ipconfig-command.pka File: 17.1.6-packet-tracer---use-the-ping-command.pka File: 13 The Cisco Troubleshooting Methodology_20241209.pkt
		32		
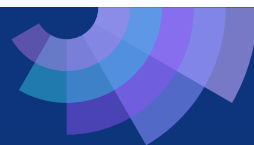
Course Plan 1-5

	Week	Class	Course Title	Course contents
17	5/19~ 5/30	33	期末試験	End of term test
18	5/19~ 5/30	34	試験結果のレビュー	Revew
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授業の進め方

- Quiz、確認テストの提出で出席をチェックする。
- Quiz、確認テストの点数は成績に含めない。

今日の学習目標
今日の授業が終わった時に習得しておくべきこと（1–2分）

Quizで確認
授業の途中にQuizで理解を確認 （5–10分）

授業の最後に質問やディスカッション
今日の授業で勉強したことについて質問やフリートーク（5分）

1

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今日の授業について
今日の授業の内容の説明 （1–2分）

3

授業
主にOnline CourseとPacket Tracerを使って学習 （100–120分）

5

確認テスト
今日の授業で勉強したことをテストで確認

（10–15分）