

Deputy of training
Plan and curriculums office

Competency Training standard

Title

Cisco Certified Network Associate
(CCNA Routing & switching)
ICND¹ & ICND²

Iran Technical and Vocational Training Organization
Occupational group
Information Technology (IT)

International code

۲۵۱۳-۵۳-۱۰۲-۱

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- Iran Information Technology Development Co
- Iran Information Technology Development University
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Revision Process:

- Scientific content
- According to market
- Equipment
- Tools

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۵						
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Definitions:

Job standard:

The characteristics ' required competencies and abilities for Efficient Performance in work environment is called "the Job standard", and sometimes "The Occupational standard"

Training standard:

The Training Map for achieving the Job's subset Competencies.

Job title:

Is a set of Tasks and Abilities which is expected from an employed person in the defined level

Job description:

A statement covering the most important elements of a job, namely the position or title of the job, the duties, job's relation with other jobs in a occupational field, the responsibilities, workplace conditions and required performance standards.

Course duration:

The minimum of time which is required to achieve the training objects.

Admission requirements:

The minimum of competencies and abilities which are obligatory for a potential admission.

Evaluation:

The process of collecting evidence and judgment about whether a competency is achieved or not.

Include: written examination, practical examination

Required Qualifications for Trainers:

The minimum of Trainer's technical and vocational abilities which the trainer is required to have.

Competency:

The ability of efficient performing a duty in a variety of workplaces conditions

Knowledge:

The minimum set of facts and mental capacities which is necessary for achieving a competency. This can include science, (Mathematics, physics, chemistry or biology), technology or technical.

Skill:

The minimum coordination between mind and body for achieving an ability or competency. It normally applied to practical skills.

Attitude:

A set of emotional behaviors required for achieving a competency and can have non-technical skills and occupational ethics.

Safety:

The cases which doing or not doing something can cause harm or accident

Environmental Consideration:

A set of consideration about the act which should be done to minimize the environmental damage or pollution.

competency title:**Cisco Certified Network Associate (CCNA Routing & Switching)****competency description:**

Cisco Certified Network Associate (CCNA) Routing and Switching is a certification program for entry-level network engineers that helps maximize your investment in foundational networking knowledge and increase the value of your employer's network. CCNA Routing and Switching is for Network Specialists, Network Administrators, and Network Support Engineers with 1-5 years of experience. The CCNA Routing and Switching validates the ability to install, configure, operate, and troubleshoot medium-size routed and switched networks.

The CCNA R&S certification validates the ability to install, configure, operate, and troubleshoot medium-size routed and switched networks. CCNA certified professionals have the knowledge and skills to make connections to remote sites via a WAN, and mitigate basic security threats. CCNA R&S training covers (but is not limited to) the use of these topics: IOS, IPv4, IPv6, OSPF, Cisco Licensing, Enhanced Interior Gateway Routing Protocol (EIGRP), Serial Line Interfaces, Frame Relay interfaces VLANs, Ethernet, VLSM, and basic traffic filtering.

admission requirements:

minimum degree of education: Post first year of high school

minimum physical and mental ability:-

prerequisite skills: CompTIA network+ certification

Course duration:

Course duration : 70 hours

Evaluation : (%)**Cisco Certified Network Associate Exam**

Exam Number	200-120 CCNA
Associated Certifications	CCNA Routing and Switching
Duration	90 Minutes (50-60 questions)
Available Languages	English, Japanese
Register	Pearson VUE
Exam Policies	Read current policies and requirements
Exam Tutorial	Review type of exam questions

Required Qualifications for Trainers:

CISCO CCNP degree holders with 5 years experiences

competency training standard tasks	
۱	Operation of IP Data Networks
۲	IP addressing (IPv۴ / IPv۶)
۳	LAN Switching Technologies
۴	IP Routing Technologies
۵	IP Services
۶	Network Device Security
۷	WAN Technologies
۸	Troubleshooting



*Iran Technical and Vocational
Training Organization*

Training standard
Contents analysis form

Title: Operation of IP Data Networks	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
Knowledge and Skill: <ul style="list-style-type: none"> - Recognize the purpose and functions of various network devices such as Routers, Switches, Bridges and Hubs. - Select the components required to meet a given network specification. - Identify common applications and their impact on the network - Describe the purpose and basic operation of the protocols in the OSI and TCP/IP models. - Predict the data flow between two hosts across a network. - Identify the appropriate media, cables, ports, and connectors to connect Cisco network devices to other network devices and hosts in a LAN 	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: IP addressing (IPv⁴ / IPv⁶)	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
Knowledge and Skill: - Describe the operation and necessity of using private and public IP addresses for IPv ⁴ addressing - Identify the appropriate IPv ⁴ addressing scheme to satisfy addressing requirements in a LAN/WAN environment. - Identify the appropriate IPv ⁴ addressing scheme using VLSM and summarization to satisfy addressing requirements in a LAN/WAN environment. - Describe the technological requirements for running IPv ⁶ in conjunction with IPv ⁴ such as dual stack - Describe IPv ⁶ addresses - Global unicast - Multicast - Link local - Unique local - auto configuration	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: LAN Switching Technologies	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
Knowledge and Skill: <ul style="list-style-type: none"> - Determine the technology and media access control method for Ethernet networks - Identify basic switching concepts and the operation of Cisco switches. - Collision Domains - Broadcast Domains - Types of switching - CAM Table - Configure and verify initial switch configuration including remote access management. - Cisco IOS commands to perform basic switch setup - Verify network status and switch operation using basic utilities such as ping, telnet and ssh. - Describe how VLANs create logically separate networks and the need for routing between them. - Explain network segmentation and basic traffic management concepts - Configure and verify VLANs - Configure and verify trunking on Cisco switches - DTP - Auto negotiation - Identify enhanced switching technologies - RSTP - PVSTP - Etherchannels - Configure and verify PVSTP operation - describe root bridge election - spanning tree mode 	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: IP Routing Technologies	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
Knowledge and Skill: <ul style="list-style-type: none"> - Describe basic routing concepts - Packet forwarding - Configure and verify utilizing the CLI to set basic Router configuration - Cisco IOS commands to perform basic router setup - Configure and verify operation status of an Ethernet interface - Verify router configuration and network connectivity - Cisco IOS commands to review basic router information and network connectivity - Configure and verify routing configuration for a static or default route given specific routing requirements - Differentiate methods of routing and routing protocols - Static vs. Dynamic - Link state vs. Distance Vector - ip routing table - Passive interfaces - Configure and verify OSPF (single area) - Configure OSPF v4 - Configure OSPF v6 - Configure and verify inter VLAN routing (Router on a stick) - sub interfaces - encapsulation - Configure SVI interfaces - Describe the boot process of Cisco IOS routers - Differentiate methods of routing and routing protocols - Administrative distance - Configure and verify OSPF (single area) - Configure and verify EIGRP (single AS) - Feasible Distance / Feasible Successors /Administrative distance - Auto summary 	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: IP Services	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipment's ,tools, materials ,books
Knowledge and Skill: - Configure and verify DHCP (IOS Router) - configuring router interfaces to use DHCP - Describe the types, features, and applications of ACLs - Sequence numbers - Configure and verify ACLs in a network environment - Identify the basic operation of NAT - Pool - Static - Overloading - Source addressing - One way NAT - Configure and verify NAT for given network requirements - Configure and verify NTP as a client - Recognize High availability (FHRP) - VRRP - HSRP - GLBP - Configure and verify Syslog - Describe SNMP v1 & v2	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: Network Device Security	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipment's ,tools, materials ,books
Knowledge and Skill: - Configure and verify network device security features such as: - Device password security - Enable secret vs enable - Transport - Disable telnet - SSH - VTYS - Physical security - Service password - Describe external authentication methods - Configure and verify Switch Port Security features such as - Sticky MAC - MAC address limitation - Static / dynamic - Violation modes - Err disable - Shutdown - Protect restrict - Shutdown unused ports - Err disable recovery - Assign unused ports to an unused VLAN - Setting native VLAN to other than VLAN 1 - Configure and verify ACLs to filter network traffic - Configure and verify an ACLs to limit telnet and SSH access to the router	Determined by the instructor			From CISCO
	Attitude: Speed and accuracy in doing the right thing			
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: WAN Technologies	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipment's ,tools, materials ,books
Knowledge and Skill: - Identify different WAN Technologies - Metro Ethernet - VSAT - Cellular 3G / 4G - MPLS - T1 / E1 - ISDN - DSL - Frame relay - Cable - VPN - Configure and verify a basic WAN serial connection - Configure and verify a PPP connection between Cisco routers - Configure and verify Frame Relay on Cisco	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Training standard
Contents analysis form

Title: Troubleshooting	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipment's ,tools, materials ,books
Knowledge and Skill: <ul style="list-style-type: none"> - Troubleshoot and Resolve VLAN problems - Troubleshoot and Resolve trunking problems on Cisco switches - Troubleshoot and Resolve ACL issues - Identify and correct common network problems - Troubleshoot and Resolve Spanning Tree operation issues - Troubleshoot and Resolve routing issues - Troubleshoot and Resolve OSPF problems - Troubleshoot and Resolve EIGRP problems - Troubleshoot and Resolve inter VLAN routing problems - Troubleshoot and Resolve WAN implementation issues - Troubleshoot etherchannel problems 	Determined by the instructor			From CISCO
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

Equipment & Tools & Materials & Resources (books, site, software...) form

*Required quantity for each 10 Trainees

From CISCO