

معاونت پژوهش، برنامه‌ریزی و سنجش مهارت

دفتر پژوهش، طرح و برنامه‌ریزی درسی

# استاندارد آموزش شایستگی

MikroTik Certified Network Associate (MTCNA)

## گروه شغلی

## فناوری اطلاعات

کد ملی آموزش شایستگی

۲	۵	۲	۳	۴	۰	۵	۳	۱	۷	۷	۰	۰	۲	۱
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Ministry of cooperatives  
Labour and Social Welfare



Iran Technical and Vocational  
Training Organization

Deputy of training  
Plan and curriculums office

# Competency Training standard

## Title

**MikroTik Certified Network Associate  
(MTCNA)**

*Iran Technical and Vocational*

## **Occupational group**

**Information Technology(IT)**

International code

**2523-53-100-1**

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**Revision Process:**

- Scientific content
- According to market
- Equipment
- Tools

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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:****MikroTik Certified Network Associate (MTCNA)****competency description:**

MTCNA is the entrance of MikroTik World. In comparison to CISCO , it is similar to CCNA. The holder of MTCNA Certification knows general MikroTik technology.

By the end of this training session, the student will be familiar with RouterOS software and RouterBoard products. He will also be able to configure, manage, do basic troubleshooting of a MikroTik router and provide basic services to clients.

The holder of MTCNA certification have following proficiency :

- To investigate a scenario and estimate a proper MikroTik hard ware for implementing the network.
- Will have the ability to connect to the RouterBOARD by any method like Terminal and Winbox and configure the basic items like IP Address, Default route, RouterBOARD Identity.
- Will have the ability to fully utilize the Winbox's features.
- Will Have the ability to Netinstall, Upgrade and downgrade routerboard's OS (RouterOS)
- Will have the ability to create a Backup and Restore it if necessary.
- Will have the ability to Understand MikroTik's license level to choose the right license for each scenario.
- Will have the ability to configure the static routes as well as Default route.
- Will have the ability to use MikroTik as a Layer2 and Layer 3 switch.
- Will have the ability to Run Network's necessary service like DHCP, DNS, and NAT.
- Will have a basic knowledge of firewall's concept.
- Will Run a basic firewall and related service like NAT
- Will have the ability to configure firewall (Both Layer2 and layer3 firewall) on RouterOS to achieve network security.
- Will have a basic understanding of QoS concepts and queue parameters.
- Will have the ability to Run a simple queue and manage user's bandwidth.
- Will Have a basic understanding of Tunnels and their usage
- Will have the ability to implement layer 2 and layer 3 tunnel.
- Will have a basic understanding of wireless network's concepts.
- Will have the ability to set up a basic wireless network by MikroTik Devices.

**admission requirements:**

minimum degree of education: Post first year of high school

minimum physical and mental ability:-

prerequisite skills: CompTIA Network+

**Course duration:**

*Course duration : 64 hours*

**Course Evaluation : (%)**

Number of questions	25
Passing score	60%
Conditional	50-59%
Fail	0-49%
Duration	60 Minutes
Available Language	English
Associated Certification	MTCNA

**IRANTVTO Evaluation : (%)**

Written Examination:25%

Practical Examination:65%

Ethics:10%

- MTCNA and MTCINE degree holders with 2 years experience
- Computer related Bachelor with 2 years experience

**competency training standard tasks**

<b>Row</b>	<b>Title</b>
1	<b>Introduction and MikroTik Basics</b>
2	<b>Routing</b>
3	<b>Bridging(Switching)</b>
4	<b>Wireless</b>
5	<b>Network Management</b>
6	<b>Firewall</b>
7	<b>QoS</b>
8	<b>Tunnels</b>



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Training standard

Contents analysis form

Title:	time			
	theoretical	practical	total	
	Introduction and MikroTik Basics	Determined by the instructor		
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>- About MikroTik</li> <li>- First time accessing the router</li> <li>- RouterOS command line interface (CLI)</li> <li>- RouterOS CLI principles</li> <li>- Initial configuration (Internet access)</li> <li>- Upgrading RouterOS</li> <li>- Manage RouterOS logins</li> <li>- Manage RouterOS services</li> <li>- Managing configuration backups</li> <li>- RouterOS license</li> <li>- Netinstall</li> <li>- Sources of additional information</li> <li>- Introduction and MikroTik Basics laboratory</li> </ul>	Determined by the instructor			<ul style="list-style-type: none"> <li>- Internet connection</li> <li>- MikroTik Wiki</li> <li>- Computer with at least 4Gbiga byte Of RAM</li> <li>- VMware software</li> <li>- One RouterBoad of Each model for every two person</li> </ul>
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

Training standard

Contents analysis form

Title: Routing	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>- Routing overview</li> <li>Routing concepts</li> <li>Route flags</li> <li>- Static routing</li> <li>Creating routes</li> <li>Setting default route</li> <li>Manage dynamic routes</li> <li>Implementing static routing on simple network</li> <li>- Routing laboratory</li> </ul>	Determined by the instructor			<ul style="list-style-type: none"> <li>- Internet connection</li> <li>- MikroTik Wiki</li> <li>- Computer with at least 4Gbiga byte Of RAM</li> <li>- VMware software</li> </ul>
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

Training standard

Contents analysis form

<b>Title:</b> Bridging(Switching)	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> - Bridging overview Bridging concepts Creating bridges Adding ports to bridges - Bridging laboratory	Determined by the instructor			- Internet connection - MikroTik Wiki - Computer with at least 4Gbiga byte Of RAM - VMware software
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

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Training standard

Contents analysis form

Title: Wireless	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>- 802.11n Concepts</li> <li>- Setup simple wireless link</li> <li>- MAC-address filtering</li> <li>- Wireless Security and Encryption</li> <li>- MikroTik wireless protocols</li> <li>- Monitoring Tools</li> <li>- Bridge wireless networks</li> <li>- Wireless laboratory</li> </ul>	Determined by the instructor			<ul style="list-style-type: none"> <li>- Internet connection</li> <li>- MikroTik Wiki</li> <li>- Computer with at least 4Gbiga byte Of RAM</li> <li>- VMware software</li> <li>- One RouterBoad which support wireless for every two person</li> </ul>
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

Training standard

Contents analysis form

Title: Network Management	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> - ARP ARP modes RouterOS ARP table - DHCP server and client DHCP client Server setup Leases management DHCP-server network Configuration - RouterOS tools Email Netwatch Ping Traceroute Profiler(CPU load) - Contacting - Network Management laboratory	Determined by the instructor			- Internet connection - MikroTik Wiki - Computer with at least 4Gbiga byte Of RAM - VMware software
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: Firewall	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>- Firewall principles</li> <li>Connection tracking and states</li> <li>Structure, chains and actions</li> <li>- Firewall Filter in action</li> <li>Filter actions</li> <li>Protecting your router (input)</li> <li>Protection your customers (forward)</li> <li>- Basic Address-List</li> <li>- Source NAT</li> <li>Masquerade and src-nat action</li> <li>- Destination NAT</li> <li>dst-nat and redirect action</li> <li>- Firewall laboratory</li> </ul>	Determined by the instructor			<ul style="list-style-type: none"> <li>- Internet connection</li> <li>- MikroTik Wiki</li> <li>- Computer with at least 4Gbiga byte Of RAM</li> <li>- VMware software</li> </ul>
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

<b>Title:</b> QoS	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>- Simple Queue</li> <li>Target</li> <li>Destinations</li> <li>Max-limit and limit-at</li> <li>Bursting</li> <li>- One Simple queue for whole</li> <li>- Network (PCQ)</li> <li>pcq-rate configuration</li> <li>pcq-limit configuration</li> <li>- Monitoring</li> <li>Interface traffic monitor</li> <li>Torch</li> <li>Graphs</li> <li>SNMP</li> <li>- QoS laboratory</li> </ul>	Determined by the instructor			<ul style="list-style-type: none"> <li>- Internet connection</li> <li>- MikroTik Wiki</li> <li>- Computer with at least 4Gbiga byte Of RAM</li> <li>- VMware software</li> </ul>
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

Training standard  
Contents analysis form

Title: Tunnels	time			Equipments ,tools, materials ,books
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>- PPP settings</li> <li>ppp profile</li> <li>ppp secret</li> <li>ppp status</li> <li>- IP pool</li> <li>Creating pool</li> <li>Managing ranges</li> <li>Assigning to service</li> <li>- Secure local network</li> <li>PPPoE service-name</li> <li>Create PPPoE server</li> <li>Point-to-point addresses</li> <li>Creating PPPoE clients on RouterOS</li> <li>- Secure remote networks communication</li> <li>PPTP client and PPTP server</li> <li>SSTP client and SSTP server</li> <li>Setup routes between networks</li> <li>- Tunnels laboratory</li> </ul>	Determined by the instructor			<ul style="list-style-type: none"> <li>- Internet connection</li> <li>- MikroTik Wiki</li> <li>- Computer with at least 4Gbiga byte Of RAM</li> <li>- VMware software</li> </ul>
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 mikrotik.com and wiki.mikrotik.com

\*Required quantity for each 15 Trainees

\*One 751 RouterBoared or similar model which support wireless for every two person