



## AIUB Institute of Continuing Education (ICE)



### MikroTik Certified Network Associate || MikroTik Certified Routing Engineer

**Course Name:** MTCNA & MTCRE (Online Course)

**Course Duration & Time:** 2 Months, Friday, 7pm to 10pm

**Course Fee:** BDT 5000.

**Outcome:** By the end of this training session, the student will be familiar with RouterOS software and RouterBOARD products and be able to connect the client to the Internet. He will also be able to configure, manage, do basic troubleshooting of a MikroTik router and provide basic services to clients. In Addition the student will be able to plan, implement and debug routed MikroTik RouterOS network configurations.

**Course prerequisites:** The student must have a good understanding of TCP/IP and subnetting.

**Course Content:**

Title	Objective
<b>Module 1</b> Introduction	<ul style="list-style-type: none"> <li>• About MikroTik</li> <li>• What is RouterOS</li> <li>• What is RouterBOARD</li> <li>• First time accessing the router</li> <li>• WinBox and MAC-WinBox</li> <li>• WebFig and Quick Set</li> <li>• Default configuration</li> <li>• RouterOS command line interface (CLI)</li> <li>• SSH and Telnet</li> <li>• New terminal in WinBox/WebFig</li> <li>• RouterOS CLI principles</li> <li>• Command history and its benefits</li> <li>• Initial configuration (Internet access)</li> <li>• WAN DHCP-client</li> <li>• LAN IP address and default gateway</li> <li>• Basic Firewall - NAT masquerade</li> <li>• Upgrading RouterOS</li> <li>• Package types</li> <li>• Ways of upgrading</li> <li>• RouterBOOT firmware upgrade</li> <li>• Router identity</li> <li>• Manage RouterOS logins</li> <li>• Manage RouterOS services</li> <li>• Managing configuration backups</li> <li>• Laboratory</li> </ul>
<b>Module 2</b> DHCP	<ul style="list-style-type: none"> <li>• DHCP server and client</li> <li>• DHCP client</li> <li>• DHCP server setup</li> <li>• Leases management</li> <li>• DHCP server network configuration</li> <li>• Address Resolution Protocol (ARP)</li> <li>• Laboratory</li> </ul>
<b>Module 3</b> Bridging	<ul style="list-style-type: none"> <li>• Bridging overview</li> <li>• Bridge concepts and settings</li> <li>• Creating bridges</li> <li>• Adding ports to bridges</li> <li>• Bridge wireless networks</li> <li>• Station bridge</li> <li>• Laboratory</li> </ul>
<b>Module 4</b> Routing	<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>• Managing dynamic routes</li> <li>• Implementing static routing in a simple network</li> <li>• Laboratory</li> </ul>
<b>Module 5</b> Wireless	<ul style="list-style-type: none"> <li>• 802.11a/b/g/n/ac Concepts</li> <li>• Frequencies (bands, channels) data-rates chains (tx power, rx sensitivity, country regulations)</li> <li>• Setup a simple wireless link</li> <li>• Access Point configuration</li> <li>• Station configuration</li> <li>• Wireless Security and Encryption</li> <li>• Access List</li> <li>• Connect List</li> <li>• Default Authenticate</li> <li>• Default Forward</li> <li>• WPA-PSK, WPA2-PSK</li> <li>• WPS accept, WPS client</li> <li>• Monitoring Tools</li> <li>• Snooper</li> <li>• Registration table</li> <li>• Laboratory</li> </ul>

<b>Module 6</b> Firewall	Firewall principles • Connection tracking and states • Structure, chains and actions • Firewall Filter in action • Filter actions • Basic Address-List • Source NAT • Masquerade and src-nat action • Destination NAT • Laboratory
<b>Module 7</b> QoS	• Simple Queue • Target • Destinations • Max-limit and limit-at • Bursting • One Simple queue for the whole network (PCQ) • pcq-rate configuration • pcq-limit configuration • Laboratory
<b>Module 8</b> Tunnels	PPP settings • PPP profile • PPP secret • PPP status • IP pool • Creating pool • Managing ranges • Assigning to a service • Secure local network • PPPoE service-name • PPPoE client • PPPoE server • Point-to-point addresses • Secure remote networks communication • Laboratory
<b>Module 9</b> Mics	RouterOS tools • E-mail • Netwatch • Ping • Traceroute • Profiler (CPU load) • Monitoring • Interface traffic monitor • Torch • Graphs • SNMP • The Dude • Contacting support@mikrotik.com • supout.rif, autosupout.rif and viewer • System logs, enabling debug logs • Readable configuration (item comments and names) • Network diagrams • Laboratory
<b>Module 10</b> Static Routing	More specific routes • ECMP • How to force gateway over specific interface • Gateway reachability check and route distance • Routing mark and route policy • Recursive next-hop and scope/target-scope usage • Laboratory
<b>Module 11</b> Point to Point Addressing	<ul style="list-style-type: none"> <li>• Point to Point address configuration • Laboratory</li> </ul>
<b>Module 12</b> VPN	• What is VPN? • Different types of VPN • Site to site connectivity with tunnels • IPIP, EoIP, PPTP, SSTP, L2TP, PPPoE • VLAN and it's usage • QinQ implementation • VLAN and managed switch • VLAN and switch chip configuration on RouterBOARDS • Laboratory
<b>Module 13</b> OSPF	• What is OSPF? • How OSPF protocol works • Hello protocol • Database distribution and LSA types explained • OSPF network structure • Areas • Router types • OSPF neighbors and neighbor states (DR and BDR election) • External Route Distribution methods (type1, type2) • Interface cost and interface types (broadcast, NBMA, etc.) • SPT calculation algorithm • OSPF and multicast (problems with NBMA) • Stub, NSSA and area ranges (route aggregation) • Virtual links, usage and limitations • OSPF routing filters and limitations • Laboratory