



## **Certified Routing Engineer (MTCRE)**

Training outline

**Duration:** 2 days

**Outcomes:** By the end of this training session, the student will be able to plan, implement and debug routed MikroTik RouterOS network configurations.

**Target audience:** Network engineers and technicians wanting to deploy and support static and/or dynamic routed networks.

**Course prerequisites:** MTCNA certificate  
Distributor and consultant support  
• training@hx.systems

Title	Objective
<b>Module 1</b> Static Routing	<ul style="list-style-type: none"> <li>• More specific routes</li> <li>• ECMP</li> <li>• How to force gateway over specific interface</li> <li>• Gateway reachability check and route distance</li> <li>• Routing mark and route policy</li> <li>• Recursive next-hop and scope/target-scope usage</li> <li>• <b>Module 1 laboratory</b></li> </ul>
<b>Module 2</b> Point to Point Addressing	<ul style="list-style-type: none"> <li>• Point to Point address configuration</li> <li>• <b>Module 2 laboratory</b></li> </ul>
<b>Module 3</b> VPN	<ul style="list-style-type: none"> <li>• What is VPN?</li> <li>• Different types of VPN</li> <li>• Site to site connectivity with tunnels             <ul style="list-style-type: none"> <li>• IPIP, EoIP, PPTP, SSTP, L2TP, PPPoE</li> </ul> </li> <li>• VLAN and it's usage</li> <li>• QinQ implementation</li> <li>• VLAN and managed switch</li> <li>• VLAN and switch chip configuration on RouterBOARDS</li> <li>• <b>Module 3 laboratory</b></li> </ul>
<b>Module 4</b> OSPF	<ul style="list-style-type: none"> <li>• What is OSPF?</li> <li>• How OSPF protocol works             <ul style="list-style-type: none"> <li>• Hello protocol</li> <li>• Database distribution and LSA types explained</li> </ul> </li> <li>• OSPF network structure             <ul style="list-style-type: none"> <li>• Areas</li> <li>• Router types</li> </ul> </li> <li>• OSPF neighbors and neighbor states (DR and BDR election)</li> <li>• External Route Distribution methods (type1, type2)</li> <li>• Interface cost and interface types (broadcast, NBMA, etc.)</li> <li>• SPT calculation algorithm</li> <li>• OSPF and multicast (problems with NBMA)</li> <li>• Stub, NSSA and area ranges (route aggregation)</li> <li>• Virtual links, usage and limitations</li> <li>• OSPF routing filters and limitations</li> <li>• <b>Module 4 laboratory</b></li> </ul>