**Certified Routing Engineer (MTCRE)**
Training outline

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| **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 |

| Title | Objective |
|---|---|
| **Module 1**<br>Static Routing | • More specific routes<br>• ECMP<br>• How to force gateway over specific interface<br>• Gateway reachability check and route distance<br>• Routing mark and route policy<br>• Recursive next-hop and scope/target-scope usage<br>• **Module 1 laboratory** |

| Title | Objective |
|---|---|
| **Module 2**<br>Point to Point Addressing | • Point to Point address configuration<br>• **Module 2 laboratory** |

| Title | Objective |
|---|---|
| **Module 3**<br>VPN | • What is VPN?<br>• Different types of VPN<br>• Site to site connectivity with tunnels<br>    • IPIP, EoIP, PPTP, SSTP, L2TP, PPPoE<br>• VLAN and it's usage<br>• QinQ implementation<br>• VLAN and managed switch<br>• VLAN and switch chip configuration on RouterBOARDs<br>• **Module 3 laboratory** |

| Title | Objective |
|---|---|
| **Module 4**<br>OSPF | • What is OSPF?<br>• How OSPF protocol works<br>    • Hello protocol<br>    • Database distribution and LSA types explained<br>• OSPF network structure<br>    • Areas<br>    • Router types<br>• OSPF neighbors and neighbor states (DR and BDR election)<br>• External Route Distribution methods (type1, type2)<br>• Interface cost and interface types (broadcast, NBMA, etc.)<br>• SPT calculation algorithm<br>• OSPF and multicast (problems with NBMA)<br>• Stub, NSSA and area ranges (route aggregation)<br>• Virtual links, usage and limitations<br>• OSPF routing filters and limitations<br>• **Module 4 laboratory** |