Course prerequisites – TCP/IP basics

Title	Objective
Module 1 MikroTik RouterOS Introduction	- MikroTik RouterOS and RouterBOARD; - First time accessing the router + **LAB**; - Winbox and MAC-Winbox; - Null Modem cable; - SSH and Telnet; - Setup Internet connection via router + **LAB**; - IP address and default gateway; - DHCP-client; - NAT masquerade; - TCP/IP Basics; - ISO layers and encapsulation; - Communication between two network devices; - IP addresses; - Networks Masks and Subnets; - Upgrade RouterOS + **LAB**; - get packages; - upgrade ways; - type of packages; - Manage RouterOS logins + **LAB**; - Manage RouterOS services; - Backup and export/import configuration + **LAB**; - save and reload backup; - edit export file; - RouterOS license; - levels; - update license + **LAB**; - NTP client configuration; - Netinstall + **LAB**; - reinstall RouterOS; - reset RouterOS

Title	Objective

Module 2 MikroTik RouterOS Firewall	• Firewall principles;
	  • structure;
	  • chains and actions + **LAB**;
	• Firewall Filter in action;
	  • filter actions;
	  • filter chains;
	  • protecting your router (input) + **LAB**;
	  • protection your customers (forward) + **LAB**;
	• RouterOS connection tracking;
	  • impact on router;
	  • connection state + **LAB**;
	• Basic Address-List + **LAB**;
	• Source NAT;
	  • actions + **LAB**;
	• Destination NAT;
	  • actions;
	  • DNS cache + **LAB**;
	• NAT limitations;

Module 3 MikroTik RouterOS QoS	• Simple Queue + **LAB**;
	  • target-address;
	  • max-limit and limit-at;
	  • dst-address;
	  • bursts;
	• Traffic Prioritization + **LAB**;
	• Simple Mangle and Tree Queue + **LAB**;
	  • mark-connection and mark-packet;
	  • queue tree;
	• PCQ setup + **LAB**;
	  • pcq-rate configuration;
	  • pcq-limit configuration;
	• Bandwidth Test + **LAB**;
	  • client;
	  • server;
	• Monitoring;
	  • interface traffic monitor;
	  • Torch;
	  • graphs + **LAB**;
	  • SNMP;

Title	Objective
Module 4 Mikrotik RouterOS Network Management	- ARP + **LAB**; - ARP modes; - RouterOS ARP table; - DHCP server and client + **LAB**; - DHCP client; - server setup; - leases management; - DHCP-server network configuration; - HotSpot + **LAB**; - setup; - users; - walled-garden; - ip-binding; - user profiles; - server profiles; - Proxy + **LAB**; - setup; - transparent proxy; - HTTP firewall; - HTTP logging; - Store; - format additional disks; - move services to store; - RouterOS tools; - E-mail; - Netwatch + **LAB**; - Ping, Traceroute; - Profile (CPU load);

Title	Objective

Module 5
MikroTik RouterOS
Wireless
	• 802.11a/b/g/n Concepts;
	  • Bands;
	  • Frequencies;
	  • Channels;
	  • Country regulation;
	• Setup simple wireless link + **LAB**;
	  • Access Point configuration;
	  • Station configuration;
	• MAC-address filtering + **LAB**;
	  • default-authentication;
	  • access-list;
	  • connect-list;
	  • default-forwarding;
	• Wireless Security and Encryption + **LAB**;
	  • WPA-PSK;
	  • WPA2-PSK;
	• 802.11n specific settings + **LAB**;
	  • data-rates;
	  • HT chains;
	  • HT guard interval;
	• MikroTik wireless protocols + **LAB**;
	  • Nstreme usage and configuration;
	  • Nstreme Dual configuration;
	  • NV2 (TDMA) configuration;
	• Monitoring Tools;
	  • Wireless scan;
	  • Snooper;
	  • Registration table;

Module 6
MikroTik RouterOS
Bridging
	• Bridging concepts + **LAB**;
	  • bridge overview;
	  • create bridge;
	  • add ports to bridge;
	• Bridge wireless networks + **LAB**;
	  • WDS modes;
	  • station-pseudobridge;
	• Bridge Wieless and remote networks + **LAB**;
	  • EoIP tunnel;
	  • VPLS tunnel;

Title	Objective

Module 7
MikroTik RouterOS
Routing
	• Routing overview;
	  • routing concepts;
	  • route table;
	  • routes abbreviation;
	  • create routes;
	• Static routing;
	  • set default gateway + **LAB**;
	  • manage dynamic routes;
	  • implement static routing on simple network + **LAB**;
	• OSPF + **LAB**;
	  • enable OSPF;
	  • implement single-area OSPF;

Module 8
MikroTik RouterOS
Tunnels
	• Secure local network;
	  • point-to-point addresses;
	  • create PPPoE client on RouterOS/Windows/MacOS + **LAB**;
	  • PPPoE service-name;
	  • create PPPoE server + **LAB**;
	• PPP settings;
	  • ppp secret + **LAB**;
	  • ppp profile + **LAB**;
	  • ppp status;
	• IP pool;
	  • create pool;
	  • manage ranges;
	  • assign to service;
	• Secure remote networks communication + **LAB**;
	  • create PPTP(L2TP) client;
	  • create PPTP(L2TP) server;
	  • setup routes between networks;