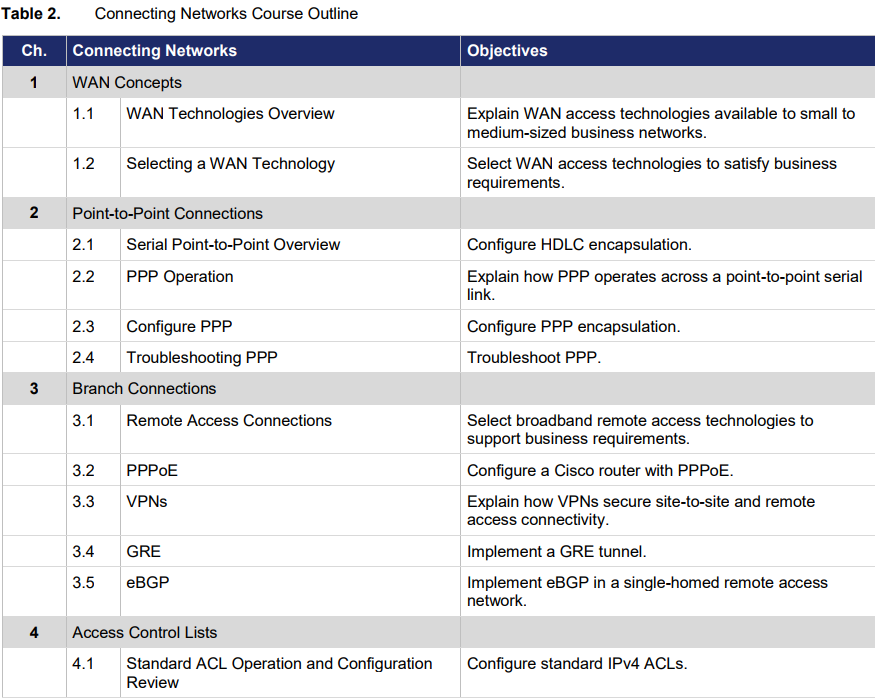
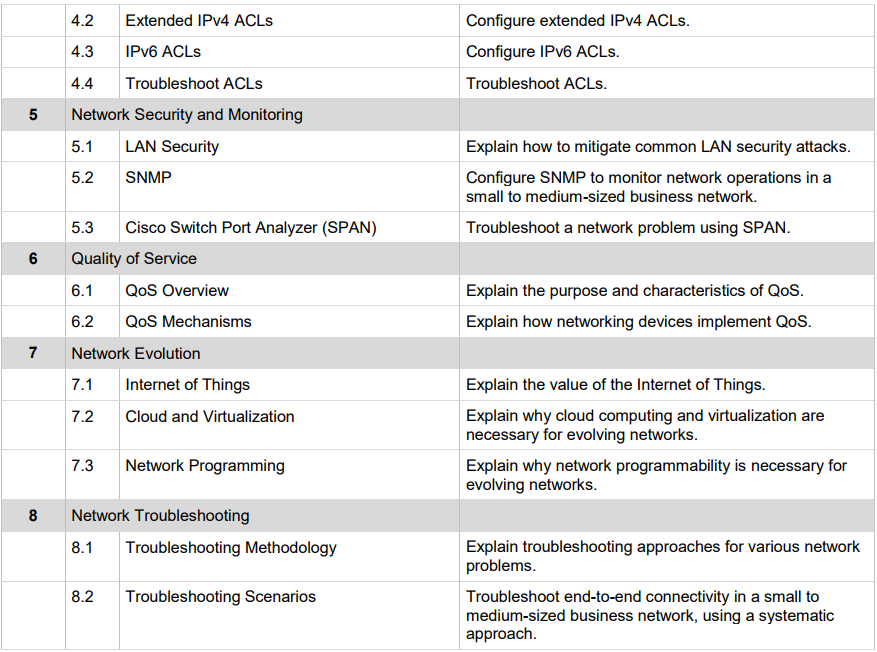
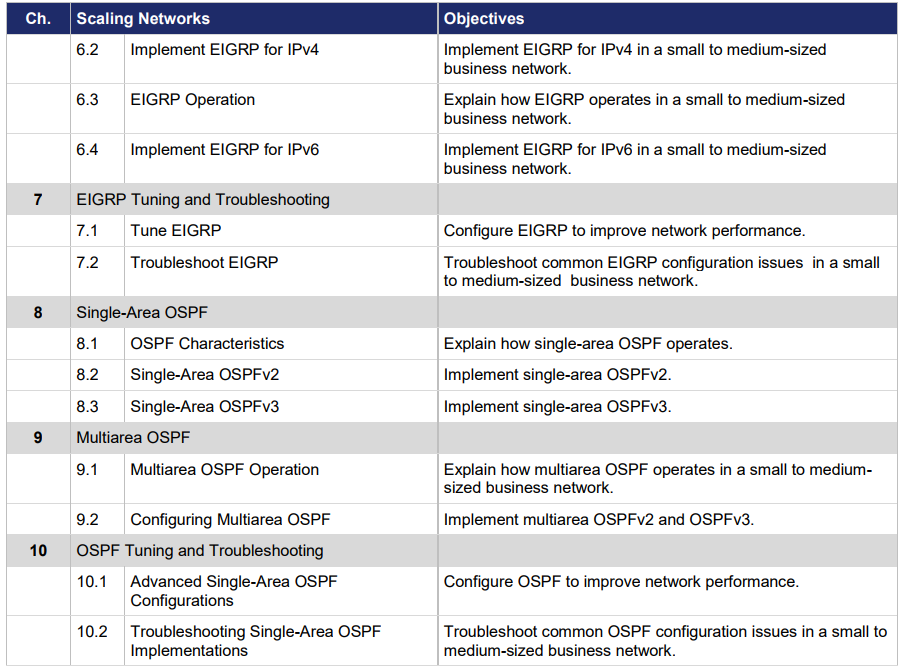
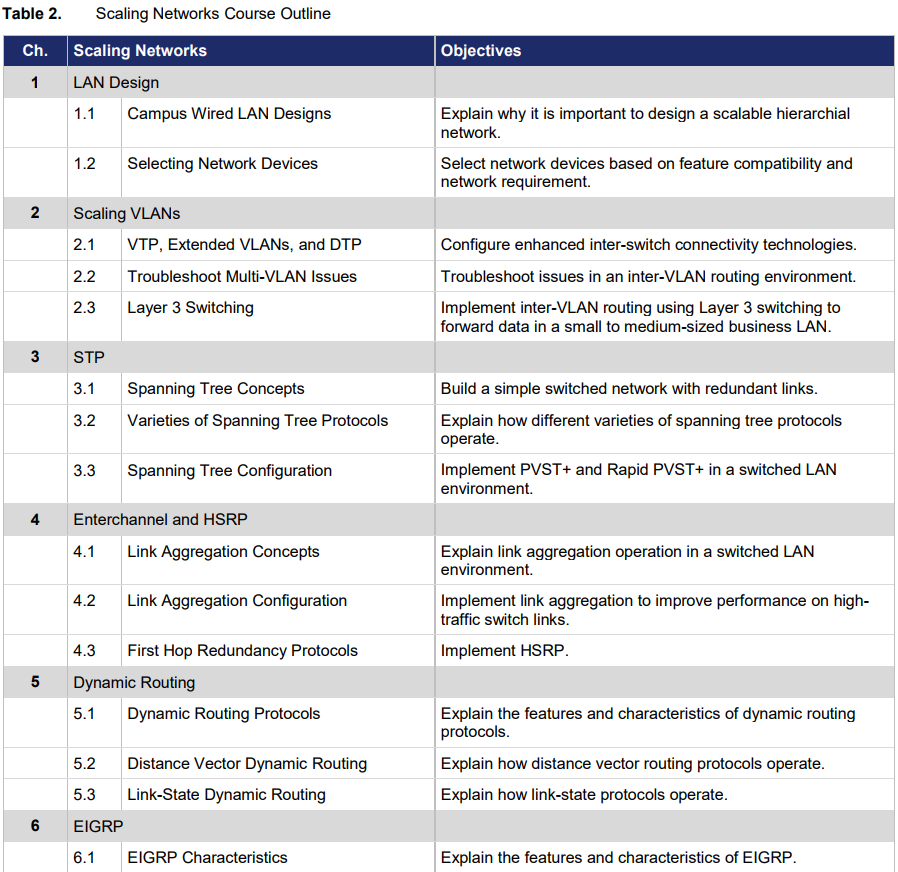
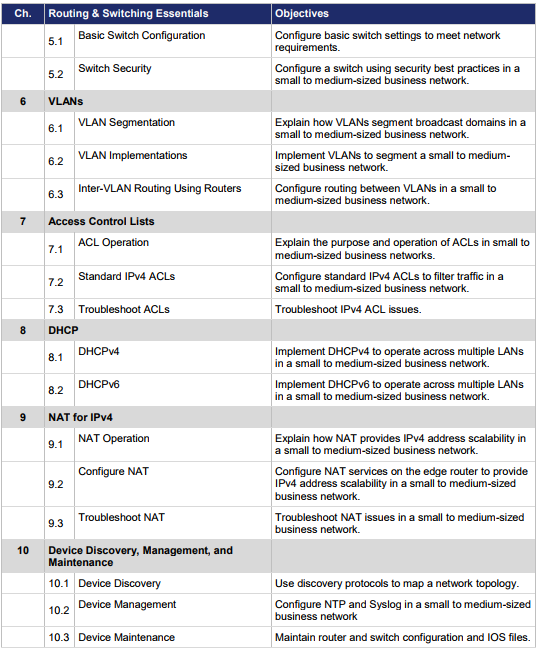
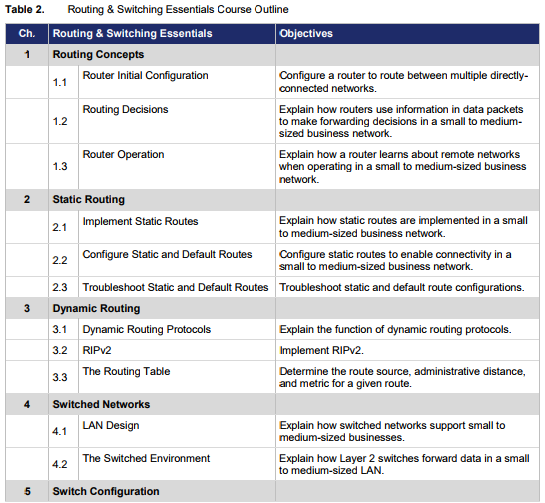
(Po skončení PS1 dostanú certifikát za CCNA2, po skončení PS2 dostanú certifikát za CCNA3 a CCNA4.)  
Cervena - Jana, Hneda – Palo, Svetlomodra – Marek, Siva - Martin **FIALOVA** – CCNA2, **ZELENA** – CCNA3, **HNEDA** – CCNA4, – PS1, – PS2

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| PS1[**CCNA2+** (**+**switching)] | | | PS2 [**CCNA3-** (**-**switching) **& CCNA4**] | | | |
|  | Prednášky | Cvičenia |  | Prednášky | Cvičenia |
| **1.** | Vysvetlenie podmienok predmetu  **RSE\_1 Routing Concepts**  **RSE\_2 Static Routing** | - Prevádzkový poriadok RB303, zápis do tried (CCNA2, a hromadne do CCNA3 a 4)  - Opakovanie PIKSu:  - TCP/IP stack - **po vrstvách**: funkcie, protokoly, zariadenia – kľúčové činnosti a predstavenie HW v labe, diagnostické nástroje - ipconfig, ping, tracert, arp, nslookup, Wireshark,..) - Subsieťovanie IPv4, IPv6 - Funkcie IOSu (router) - základná konfigurácia smerovača, smerovacia a ARP tabuľka (JU: zamerať sa na smerovače, prepínače sa z PIKSu zopakujú na cvičení 4) | **1.**  Jana | Vysvetlenie podmienok predmetu  **Opakovanie switchingu z CCNA3: SN\_1 až 4** | Opakovanie PS1 - switching: VLANs, trunks, interVLAN routes, port security, VTP, DTP, extended VLANs, L3 switching, STP, Etherchannel, HSRP |
| **2.** | **RSE\_3 Dynamic Routing (RIPv2, RIPng)** | Statické smerovanie - IPv4, IPv6 floating routes, summary routes, def. routes | **2.** | Opakovanie SN\_5 Dynamic Routing (RIP)  **SN\_6 EIGRP** | Opakovanie PS1- routing:  DHCP, NAT, ACL, RIPv2, RIPng |
| **3.**  Palo 10.10. | **RSE\_4 Switched Networks**   **+ SN\_1 LAN Design**  **RSE\_5 Switch Configuration** | RIPv2 + RIPng | **3.** | **SN\_7 EIGRP Tuning and Troubleshooting ps- mam cele update na v6** | Opakovanie PS1 – IPv6: SLAAC/DHCPv6, HSRPv2, RIPng, IPv6 ACL |
| **4.** | **RSE\_6 VLANs, interVLAN routing**  **+ SN\_2 Scaling VLANs (VTP, extendVLAN, DTP, L3 switching)** | Komplexná konfigurácia prepínača, prepínacia a ARP tabuľka + port security | **4.**  Jana  15.3. | **SN\_8 Single-Area OSPF** | EIGRP rozšírené |
| **5.**  Palo  24.10 | **SN\_3 STP (iba STP, PVST, RSTP)** | VLANS, Trunks  InterVLAN routing  VTP, DTP | **5.**  22.3. | **SN\_9 Multiarea OSPF**  **SN\_10 OSPF Tuning and Troubleshooting ps- mam cele update na v6** | OSPF |
| **6.**  Palo  31.10 | **SN\_4 Etherchannel and HSRP**  (pre rok 2018: tu možno dorozprávať RSTP, alebo čo sa nestihlo z STP na predošlej prednáške) | STP, PVST+, RSTP, RPVST+, L3 switching (extended VLANs – da sa?) | **6.**  29.3. | **CN\_1 WAN Concepts ps- mam cele update na v6**  **CN\_2 Point-to-Point Connections (PPP) ps- mam cele update na v6** | OSPF rozšírené |
| **7.** | **RSE\_7 Access Control Lists (štand. IPv4)**  **+ CN\_4 Access Control Lists (rozšírené, aj IPv6 ACLs)** | EtherChannel - LACP/PAGP  HSRP, GLBP, VRRP  (pre rok 2018: na toto cviko iba IPv4 HSRP a iba HSRP a GLBP. VRRP a IPv6 nechať na cv.9) | **7.**  5.4. | **CN\_3 Branch Connections (PPPoE, VPN, GRE, eBGP)** + IPSec  (v 6.0 je to bez IPSec-u, ale bude sa prednasať) | **FINAL z CCNA 3**  PPP, HDLC |
| **8.** | **RSE\_8 DHCP v4, v6**  (pre rok 2018: sem presunut poslednu stvrtinu prednasky o ACL – rozšírené cez established, IPv6 a komplexné) | ACLs  (iba IPv4 standard a extended) | **8.**  Jana  12.4. | **CN\_6 Quality of Service – jana, cela prednaska, samostatne nie z 9kou** | PPPoE, GRE, eBGP (bez IPSecu) |
| **9.** | **RSE\_9 NAT for IPv4** | DHCPv6 (každý študent 3xVLANs: 1. SLAAC, 2. stateless, 3. statefull)  + HSRP pre IPv6 (per VLANs), + IPv6 ACLs (na subrozhraniach) | **9.**  Marek  19.4. | **CN\_7 Network Evolution (IOT, cloud, net program.)**  **Marek cela prednaska**  CN\_8 Network Troubleshooting – na doma | Opakovanie z PS1: CN\_4 ACLs, CN\_5 SNMPaSPAN  (prípadne GRE, ak sa nestihne na cv.8) |
| **10.** | **RSE\_10 Device Discovery, Management, and Maintenance  (LLDP, CDP, Syslog, NTP,..)**  **CN\_5 Network Security and Monitoring (SNMP, SPAN)** | NAT + DHCPv4 | **10.**  Martin  26.4. | **Junos – časť 1** | **FINAL z CCNA 4.**  Opakovanie PS2 - veľká cvičná topológia. |
| **11.** | **Zadanie v PT – opakovanie - problémové témy** | LLDP, CDP, Syslog, NTP, SNMP, SPAN, útoky/zneužitie: CDP, Telnet, Mac address flood, VLAN, DHCP | **11.**  Martin  3.5. | **Junos – časť 2** | Junos – prakticky? Vo virtuálkach? (toto treba ešte prediskutovať, či sa dá, v evNG?) |
| **12.** | - nie je – (konzultácie) | **Opravné testy (max. 3) + FINAL z CCNA2** | **12.**  Martin  10.5. | **Junos – časť 3** | Junos – prakticky? Vo virtuálkach? |
| **13.** | - | **-** | **13.** | - | Junos – prakticky? Vo virtuálkach? **Opravné testy (max. 3)** |

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| **Nova verzia 6.0** | = PS1, = PS2 |  |
| CCNA2 ver. 6.0 RSE=Routing and Switching Essentials  **RSE\_1 Routing Concepts**  **RSE\_2 Static Routing**  **RSE\_3 Dynamic Routing (RIPv2, my pridáme RIPng)**  **RSE\_4 Switched Networks**  **RSE\_5 Switch Configuration (+port security)**  **RSE\_6 VLANs (+ interVLAN routing)**  **RSE\_7 Access Control Lists (iba štandardné IPv4)**  **RSE\_8 DHCP v4 aj v6**  **RSE\_9 NAT for IPv4**  **RSE\_10 Device Discovery, Management, and Maintenance (LLDP, CDP, Syslog, NTP,..)** | CCNA3 ver. 6.0 SN=Scaling Networks:  **SN\_1 LAN Design**  **SN\_2 Scaling VLANs (VTP, DTP, extendedVLANs, L3 switching)**  **SN\_3 STP**  **SN\_4 Etherchannel and HSRP**  **SN\_5 Dynamic Routing**  **SN\_6 EIGRP**  **SN\_7 EIGRP Tuning and Troubleshooting**  **SN\_8 Single-Area OSPF**  **SN\_9 Multiarea OSPF**  **SN\_10 OSPF Tuning and Troubleshooting** | CCNA4 ver. 6.0  CN=Connecting Networks  **CN\_1 WAN Concepts**  **CN\_2 Point-to-Point Connections (PPP)**  **CN\_3 Branch Connections (PPPoE, VPN, GRE, eBGP)**  **CN\_4 Access Control Lists (rozšírené a IPv6)**  **CN\_5 Network Security and Monitoring (SNMP, SPAN)**  **CN\_6 Quality of Service**  **CN\_7 Network Evolution (IOT, cloud, net programming)**  **CN\_8 Network Troubleshooting** |
| **Stara verzia 5.3** | = PS1, = PS2 |  |
| CCNA2 ver. 5.3  **RSE\_01: Úvod do prepínaných sietí** **RSE\_02: Komplexná konfigurácia prepínačov** **RSE\_03: Virtuálne LAN siete** **RSE\_04: Princípy smerovania** **RSE\_05: Smerovanie medzi virtuálnymi VLAN sieťami** **RSE\_06: Statické smerovanie** **RSE\_07: Úvod do dynamického smerovania** **RSE\_08: Smerovací protokol OSPF (single area)** **RSE\_09: ACL** **RSE\_10: DHCP** **RSE\_11: NAT** | CCNA3 ver. 5.3  **SN\_01: Dizajn sietí, Hierarchický model, výber zariadení do podnikovej siete**  **SN\_02: Problematika redundancie a slučiek. STP/RSTP a koncepcia redundancie default brány.**  **SN\_03: Agregácia v LAN - EtherChannel.**  **SN\_04: Wireless LAN**  **SN\_05: Adjust and troubleshooting single-area OSPF**  **SN\_06: Multiarea OSPF**  **SN\_07: EIGRP**  **SN\_08: EIGRP Advanced Configurations and Troubleshooting**  **SN\_09: IOS Images and Licencing** | CCNA4 ver. 5.3  **CN\_01: Sieťové modely (Hierarchical Networks Design)**  **CN\_02: Úvod do WAN**  **CN\_03: PPP**  **CN\_04: Frame Relay**  **CN\_05: NAT pre IPv4**  **CN\_06: Broadband Solutions**  **CN\_07: Securing Site-to-Site Connectivity**  **CN\_08: Monitoring the Network**  **CN\_09: Troubleshooting the Network** |

**Podrobnejší obsah CCNA 2, 3, 4 ver. 6.0 – o stranu nizsie je uplny obsah**





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| **CCNA 2 v6.0** | **CCNA 3 v6.0** | **CCNA 4 v6.0** |
| **Chapter 1**  **Routing Concepts**  **1.1 Router Initial Configuration**  1.1.1 Router Functions  [1.1.1.1 Characteristics of a Network](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.1)  [1.1.1.2 Why Routing?](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.2)  [1.1.1.3 Routers Are Computers](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.3)  [1.1.1.4 Routers Interconnect Networks](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.4)  [1.1.1.5 Routers Choose Best Paths](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.5)  [1.1.1.6 Packet Forwarding Mechanisms](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.6)  [1.1.1.7 Activity - Identify Router Components](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.7)  [1.1.1.8 Packet Tracer - Using Traceroute to Discover the Network](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.8)  [1.1.1.9 Lab - Mapping the Internet](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.1.9)  1.1.2 Connect Devices  [1.1.2.1 Connect to a Network](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.1)  [1.1.2.2 Default Gateways](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.2)  [1.1.2.3 Document Network Addressing](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.3)  [1.1.2.4 Enable IP on a Host](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.4)  [1.1.2.5 Device LEDs](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.5)  [1.1.2.6 Console Access](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.6)  [1.1.2.7 Enable IP on a Switch](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.7)  [1.1.2.8 Activity - Document an Addressing Scheme](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.8)  [1.1.2.9 Packet Tracer - Documenting the Network](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.2.9)  1.1.3 Router Basic Settings  [1.1.3.1 Configure Basic Router Settings](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.3.1)  [1.1.3.2 Configure an IPv4 Router Interface](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.3.2)  [1.1.3.3 Configure an IPv6 Router Interface](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.3.3)  [1.1.3.4 Configure an IPv4 Loopback Interface](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.3.4)  [1.1.3.5 Packet Tracer - Configuring IPv4 and IPv6 Interfaces](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.3.5)  1.1.4 Verify Connectivity of Directly Connected Networks  [1.1.4.1 Verify Interface Settings](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.4.1)  [1.1.4.2 Verify IPv6 Interface Settings](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.4.2)  [1.1.4.3 Filter Show Command Output](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.4.3)  [1.1.4.4 Command History Feature](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.4.4)  [1.1.4.5 Packet Tracer - Configuring and Verifying a Small Network](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.4.5)  [1.1.4.6 Lab - Configuring Basic Router Settings with IOS CLI](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.1.4.6)  **1.2 Routing Decisions**  1.2.1 Switching Packets Between Networks  [1.2.1.1 Router Switching Function](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.1.1)  [1.2.1.2 Send a Packet](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.1.2)  [1.2.1.3 Forward to the Next Hop](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.1.3)  [1.2.1.4 Packet Routing](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.1.4)  [1.2.1.5 Reach the Destination](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.1.5)  [1.2.1.6 Activity - Match Layer 2 and Layer 3 Addressing](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.1.6)  1.2.2 Path Determination  [1.2.2.1 Routing Decisions](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.2.1)  [1.2.2.2 Best Path](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.2.2)  [1.2.2.3 Load Balancing](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.2.3)  [1.2.2.4 Administrative Distance](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.2.4)  [1.2.2.5 Activity - Order the Steps in the Packet Forwarding Process](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.2.5)  [1.2.2.6 Activity – Match the Administrative Distance to the Route Source](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.2.2.6)  **1.3 Router Operation**  1.3.1 Analyze the Routing Table  [1.3.1.1 The Routing Table](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.1.1)  [1.3.1.2 Routing Table Sources](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.1.2)  [1.3.1.3 Remote Network Routing Entries](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.1.3)  [1.3.1.4 Activity - Interpret the Content of a Routing Table Entry](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.1.4)  1.3.2 Directly Connected Routes  [1.3.2.1 Directly Connected Interfaces](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.2.1)  [1.3.2.2 Directly Connected Routing Table Entries](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.2.2)  [1.3.2.3 Directly Connected Examples](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.2.3)  [1.3.2.4 Directly Connected IPv6 Example](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.2.4)  [1.3.2.5 Packet Tracer - Investigating Directly Connected Routes](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.2.5)  1.3.3 Statically Learned Routes  [1.3.3.1 Static Routes](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.3.1)  [1.3.3.2 Static Route Examples](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.3.2)  [1.3.3.3 Static IPv6 Route Examples](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.3.3)  1.3.4 Dynamic Routing Protocols  [1.3.4.1 Dynamic Routing](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.4.1)  [1.3.4.2 IPv4 Routing Protocols](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.4.2)  [1.3.4.3 IPv4 Dynamic Routing Examples](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.4.3)  [1.3.4.4 IPv6 Routing Protocols](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.4.4)  [1.3.4.5 IPv6 Dynamic Routing Examples](https://static-course-assets.s3.amazonaws.com/RSE6/en/index.html#1.3.4.5)  **1.4 Summary**  1.4.1 Conclusion  [1.4.1.1 Activity - 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**Hodnotenie 2016/2017:**

**Priebezne na cviceni**

* 10 otazok – z kazdej prednasky, 1 sa vyberie nahodne, vsetci budu mat rovnaku otazku, 0-4 body, 10x4 =40
* Netacad testy elektronicke – budu robit doma, bez vahy v gradebooku, nebude sa bodovat, len priprava na FINAL exam

**Skuska**

* FINAL CCNA2 – ten co je na Netacade
* USTNA – vybrat 5 otazok z nasej sady 100-150 otazok
* SKILL – prax (návrh, zapojenie a konfigurácia)

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| *Podmienky*  *ku skúške* | * priebežné otvorené otázk**y – [váha** 25% **z celkového skóre] - na začiatku každej hodiny sa píše “test” s 1 náhodne vylosovanou otázkou z témy prednášky. Odpoveď na otázku bude otvorená, t.j. študent vkladá slovne svoju odpoveď k danej otázke, buď na papier alebo elektronicky do textového poľa (Netacad alebo Moodle). Na každej hodine je takto možné získať max. 4 body, spolu na 2. až 11. cvičení to je 10x4=40 bodov, ktoré sa započítavajú ku skúške. Potrebné je dosiahnuť minimálne 60% bodov, t.j. min. 24 bodov z 40.** * priebežné testy z kapitol **– [váha** 0**% z celkového skóre] – tzv. chapter exams z obsahu CCNA2 (a vybraných kapitol CCNA3) na portáli Netacad – Testy sú prípravou na veľký test FINAL exam, ktorý sa bude písať v čase skúškového obdobia (alebo v 13. týždni). Študent ich môže robiť z domu. Pre testy preto nie je stanovené žiadne potrebné minimálne skóre. Váha každého priebežného testu na celkovom skóre za CCNA2 (resp. CCNA3) je 0%.** * **každý cvičiaci má právo si stanoviť navyše svoju vlastnú podmienku, ktorá tieto spoločné podmienky nebude negovať, ale dopĺňať. Napríklad je vysoko žiadúce, aby študent počas laboratórneho cvičenia systematicky pracoval a bolo vidieť aj výsledok jeho snahy. Pokiaľ sa k očakávanému výsledku nedopracuje, je možné takémuto študentovi stanoviť praktické zadanie (v programe Packet Tracer, alebo inak), ktoré musí vypracovať dodatočne a odovzdať a/alebo prezentovať cvičiacemu v stanovenom termíne.** |
| *Skúška* | * teoretický **CCNA2 Final Exam** test - [váha **15**%z celkového skóre] – teoreticko-praktické otázky formou elektronického testu na portáli Netacad, s výberom odpovede. Potrebné je dosiahnuť minimálne 60% z FINAL testu. * **písomno/ústna skúška** s otvorenými otázkami - [váha **25%** z celkového skóre] – na skúške sa náhodne vygeneruje 5 otázok zo sady otázok, ktoré sa používali počas semestra na hodinách na priebežné testovanie, s možnosťou získať max. 4 body za jednu otázku, t.j. spolu 5x4=20 bodov. Potrebné je dosiahnuť minimálne 60% bodov, t.j. minimálne 12 z 20 bodov. * praktická skúška **Skill Exam** – [váha **35%** z celkového skóre] - zadanie praktickej úlohy obsahuje náplň celého kurzu CCNA2 a vybraných tém z CCNA3 (témy bude určovať prednáška). Na praktickú skúšku sa môže zapísať ten študent, ktorý úspešne absolvoval FINAL exam a písomno/ústnu skúšku. Termíny na praktickú skúšku budú v čase zimného skúškového obdobia, prihlasovanie bude realizované cez vzdelávanie, v predstihu je ho možné robiť na cvičení v 13. týždni (čo je v réžií každého cvičiaceho a závisí od okolností počas semestra). Potrebné je dosiahnuť minimálne 60% bodov z praktickej skúšky.   Celkové skóre = Priebežné\_otvorené\_otázky [25%] + FINAL exam [15%] + písomno/ústna skúška [25%] + SKILL exam [35%]   (pričom pre každú časť je potrebné dosiahnuť minimálne 60% úspešnosť) |
| *Hodnotenie:* | Počet bodov potrebný na získanie jednotlivých známok:   <92, 100> bodov A   <84, 92) bodov B   <76 - 84) bodov C   <68, 76) bodov D   <60, 68) bodov E |