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| COURSE LEVEL | COURSE OVERVIEW |
| *Junos Intermediate Routing* (JIR) is an intermediate-level course. | This two-day course provides students with intermediate routing knowledge and configuration examples. The course includes an overview of protocol-independent routing features, load balancing and filter-based forwarding, OSPF, BGP, IP tunneling, and high availability (HA) features.Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring device operations. This course uses Juniper Networks vSRX Series Services Gateways for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running the Junos OS. This course is based on Junos OS Release 18.2R1.9. |
| AUDIENCE |
| This course benefits individuals responsible for configuring and monitoring devices running the Junos OS. |
| PREREQUISITES |  |
| Students should have basic networking knowledge and an understanding of the Open Systems Interconnection (OSI) reference model and the TCP/IP protocol suite. Students should also attend the Introduction to the Junos Operating System (IJOS course prior to attending this class | OBJECTIVES |
| * Describe typical uses of static, aggregate, and generated routes.
* Configure and monitor static, aggregate, and generated routes.
* Explain the purpose of Martian routes and add new entries to the default list.
* Describe typical uses of routing instances.
* Configure and share routes between routing instances.
* Describe load-balancing concepts and operations.
* Implement and monitor Layer 3 load balancing.
* Illustrate benefits of filter-based forwarding.
* Configure and monitor filter-based forwarding.
* Explain the operations of OSPF.
* Describe the role of the designated router.
* List and describe OSPF area types.
* Configure, monitor, and troubleshoot OSPF.
* Describe BGP and its basic operations.
* Name and describe common BGP attributes.
* List the steps in the BGP route selection algorithm.
* Describe BGP peering options and the default route advertisement rules.
* Configure and monitor BGP.
* Describe IP tunneling concepts and applications.
* Explain the basic operations of generic routing encapsulation (GRE) and IP over IP (IP-IP) tunnels.
* Configure and monitor GRE and IP-IP tunnels.
* Describe various high availability features supported by the Junos OS.
* Configure and monitor some of the highlighted high availability features
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| ASSOCIATED CERTIFICATION |
| [JNCIS-ENT](https://www.juniper.net/us/en/training/certification/resources/jncis-enterprise/) [JNCIS-SP](https://www.juniper.net/us/en/training/certification/resources/jncis-sp/) |
| RELEVANT JUNIPER PRODUCT |
| * Automation
* Junos OS
* M Series
* MX Series
* PTX Series
* QFX Series
* SRX Series
* T Series
* Service Provider Routing and Switching Track
* Enterprise Routing and Switching Track
* Instructor-Led training
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| RECOMMENDED NEXT COURSE |  |
| * *Advanced Junos Enterprise Switching*

(AJEX)* *Advanced Junos Enterprise Routing* (AJER)
* *Junos Multicast Routing* (JMR)
* *Junos Class of Service* (JCOS)
* *Advanced Junos Service Provider Routing*

(AJSPR)* *Junos Layer 3 VPNs* (JL3V)
* *Junos Layer 2 VPNs* (JL2V)
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# COURSE CONTENT

**Day 1**

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| **1** | **COURSE INTRODUCTION** |
| **2** | **Protocol-Independent Routing*** Static Routes
* Aggregated Routes
* Generated Routes
* Martian Addresses
* Routing Instances

**LAB 1: Protocol-Independent Routing** |
| **3** | **Load Balancing and Filter-Based Forwarding*** Overview of Load Balancing
* Configuring and Monitoring Load Balancing
* Overview of Filter-Based Forwarding
* Configuring and Monitoring Filter-Based Forwarding

**LAB 2: Load Balancing and Filter-Based Forwarding** |

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| **4** | **Open Shortest Path First*** Overview of OSPF
* Adjacency Formation and the Designated Router Election
* OSPF Scalability
* Configuring and Monitoring OSPF
* Basic OSPF Troubleshooting

**LAB 3: Open Shortest Path First** |

**Day 2**

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| **5** | **Border Gateway Protocol*** Overview of BGP
* BGP Attributes
* IBGP Versus EBGP
* Configuring and Monitoring BGP

**LAB 4: Border Gateway Protocol** |

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| **7** | **High Availability*** Overview of High Availability Networks
* Graceful Restart
* Graceful RE Switchover
* Nonstop Active Routing
* BFD
* VRRP

**LAB 6: High Availability** |

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| **6** | **IP Tunneling*** Overview of IP Tunneling
* GRE and IP-IP Tunnels
* Implementing GRE and IP-IP Tunnels

**LAB 5: IP Tunneling** |

**Appendix C: Routing Information Protocol**

* **Introduction to RIP**
* **RIP Configuration Examples**
* **Monitoring and Troubleshooting RIP**

**Appendix A: IPv6**

* **Introduction to IPv6**
* **Routing Protocol Configuration Examples**
* **Tunneling IPv6 over IPv4**

**LAB 7 (Optional): IPv6**

**Appendix B: IS-IS**

* **Overview of IS-IS**
* **Overview of IS-IS PDUs**
* **Adjacency Formation and DIS Election**
* **Configuring and Monitoring IS-IS**
* **Basic IS-IS Troubleshooting**

**LAB 8 (Optional): IS-IS**

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