Red River College Polytechnic campuses are located on the lands of Anishinaabe, Ininiwak, Anishininew, Dakota, and Dené, and the National Homeland of the Red River Métis.

Course Outline

Course Information

**Course Code and Title:** NTWK-3010 Network Computing 3

**Course Section:** All Sections

**Department/Program:** Applied Computer Education/Business Information Technology

**Total Hours:** 80

**Credit Hours:** 5

## Course Description:

## This course conforms to the third course (in Cisco’s current revision) leading to the Cisco Certified Network Associate (CCNA) designation. This course covers redundant and scalable network design with appropriate hardware components.

## 

## Students will plan, implement and troubleshoot networks of various design. They will learn how to connect networks using single-area OSPF and methods to inter-connect networks globally. Students will examine common network attacks, then implement security best practice configuration. Students will be introduced to network management using Application Programming Interfaces (API), remote probing and logging tools to gain insight into how modern network infrastructure is managed and maintained.

## 

## This course includes procedural labs in each module, including basic configuration, implementation and troubleshooting labs. Packet Tracer activities reinforce new concepts, and allow students to simulate and analyze routing and switching processes.

## Recognition of Prior Learning (RPL):

RPL is a process in which students have the opportunity to obtain credit for College-level knowledge and skills gained outside the classroom and/or through other educational programs. It is a process that documents and compares a student’s prior learning gained from education, work and life experience to the learning outcomes in College courses/programs. For more information about RPL at RRC Polytech, refer to the RPL website at [rrc.ca/RPLservices](http://www.rrc.ca/RPLservices) or [A14 - RPL Policy](https://www.rrc.ca/legal/policies/recognition-of-prior-learning/).

For general information and assistance with RPL, contact RRC Polytech’s RPL Advisor at 204.632.3094 or [rpladvisor@rrc.ca](mailto:rpladvisor@rrc.ca).

## Accessibility Statement:

RRC Polytech is committed to providing persons with documented disabilities fair and equal access to educational programs, services and facilities. If you are a student with a disability\* and require reasonable accommodations, you must connect with Student Accessibility Services (SAS) who will assist in developing and implementing your accommodation plan. Refer to the [Student Accessibility Services webpage](https://www.rrc.ca/accessibility/) for information about SAS locations and how to [book an appointment](https://hub.rrc.ca/Forms/Start/AccessibilityRequest?_ga=2.209090074.987068331.1650400536-653561319.1650400536). Students with disabilities are also encouraged to have a private discussion with their instructor(s) to facilitate greater understanding of their learning needs.

\*RRC Polytech’s definition of “disability” is consistent with the Manitoba Human Rights Code. In the educational setting, “disability” refers to a permanent or temporary medical, physical, sensory, mental health (e.g., anxiety, depression), learning, or neurological (e.g., ADHD, Autism Spectrum Disorder) condition that interferes with a student’s ability to fully participate in their studies and/or other associated activities.

## Academic Integrity:

Academic Integrity means acting with the values of honesty, trust, respect, responsibility, fairness and courage in learning, teaching and research to ensure that the credentials granted by RRC Polytech accurately represent demonstrated knowledge, skills and abilities. All members of the RRC Polytech community are expected to demonstrate these values through RRC Polytech learning activities, relationships and commitments. Clear expectations will be communicated to students to promote positive academic practices in compliance with RRC Polytech’s [Academic Integrity policy](https://www.rrc.ca/legal/policies/academic-integrity/). Contact [academicintegrity@rrc.ca](mailto:academicintegrity@rrc.ca) for additional information.

## Academic Requisites:

## • NTWK-2010 Network Computing 2

## • Cisco CCNA 2 (Routing and Switching Essentials or Switching, Routing and Wireless Essentials) Certificate

## Course Delivery Methods:

This course is delivered in a blended environment.

The following communication tools will be used in this course:

Academic Email, Discussion Board, Scheduled and Unscheduled Chats, LinkedIn Learning, Microsoft Teams, Online Content in Learn.

Course format:

## The course is conducted in a lecture/lab format. The theory content of the course is available on Cisco’s Network Academy website, and internet connection is required to access it. The lab environment provides students with the opportunity to put skills to use as they are learned. The lecture component of the course delivery comprises approximately 1 hour per week, the lab component approximately 4 hours per week, and student can expect to spend another 2 hours per week outside of class.

## Effective Date:

August 26, 2024

Instructor Information

**Instructor’s name:** Navjot Kaur

**Email:** nkaur47@rrc.ca

**Office phone:** [Office phone here]

**Office location:** [Office location]

**Office hours:** [Office hours]

Student Readiness

## Technology and Equipment Readiness:

* Laptop meeting BIT program requirements
* Internet access with sufficient bandwidth for video conferencing
* Web camera and microphone are required
* Lab journal for recording notes

## Student Commitments and Contact Times:

## • 5 hours scheduled daytime attendance per week via synchronous or asynchronous online delivery.

## • Students are expected to commit time outside of regularly scheduled classes.

## • Students in this course are expected to regularly check their academic email account or ensure it is forwarded to another checked account.

## • Instructors will notify students at the beginning of the term of any course-specific communication methods.

## Course Resources:

Learn and Netacad access required.

Cisco Packet Tracer will be downloaded from the Netacad.

Textbook(s):

None Required – All material available online

References:

Online content – https://www.netacad.com/

Student Learning

## Learning Outcomes and elements of performance:

By the end of this course of study, you should be able to...

## 1. Implement a single-area OSPF configuration and explain the process of it’s convergence

## 2. Troubleshoot common problems with OSPF and fine-tune operations in a network

## 3. Describe different forms of attacks that can occur on a network and how system operations handle them

## 4. Plan, implement, and troubleshoot standard and extended Access Control List rules

## 5. Configure Network Address Translation to meet the demands of your network

## 6. Explain how networks are connected globally and some of the technology used

## 7. Set up and utilize network services like NTP, Syslog, SNMP and CDP/LLDP for greater control of a network

## 8. Discuss, plan, and implement different network design models commonly used

## 9. Understand how to troubleshoot many different networking problems and some of the different methods to approach solutions

## 10. Describe network virtualization, cloud managed, and software defined networks and their capabilities

## 11. Plan, implement, and create simple and complex network automation and reporting tools using common application programming interfaces

## Instructional Schedule, Assessments and Dates:

[Identify dates that correspond to modules, units or weeks and important deadlines and events. List the topics, learning outcomes and methods of evaluation that will be used to assess student mastery of the course learning outcomes. Include assignment due dates, quizzes, exams, scheduled chats, VW dates, deadlines, etc.

Align each assessment method with one or more learning outcome and list the respective weight assigned to each method of evaluation. The summation of assessment methods will be used to determine the final grade.

Add rows to table as needed. Delete these instructions when completed.]

**NOTE:** The following dates are subject to change based on the needs of the students at the instructor’s prerogative. Students will be notified ahead of time of any changes.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module/Unit/Week  or Important Event | | Topic and Learning Outcome(s) | Assessment  and Evaluation | Weight | Due Date | |
| First Day of Classes | |  |  |  | Aug 26 | |
| Add/Drop Period | |  |  |  | Aug 26-30 | |
| Labour Day (No Classes) | |  |  |  | Sept. 2 | |
| Week 1 | | Single-Area OSPFv2 Configuration | PT 2.2.13  PT 2.3.11 | 2.42% | Sep 9 | |
| Week 2 | | Single-Area OSPFv2 Configuration/ Network Security | PT 2.4.11  PT 2.5.3  PT 2.6.6  PT 2.7.1  Lab 2.7.2 | 6.48% | Sep 9 | |
| Week 3 | | ACL Configuration | PT 4.1.4  PT 5.1.8  PT 5.1.9  PT 5.2.7  Module 1-2 Exam | 5.84% | Sep 16 | |
| Week 4 | | ACL Configuration Cont. | PT 5.4.12  PT 5.4.13  PT 5.5.1  Lab 5.5.2 | 5.3% | Sep 23 | |
| Week 5 | | Network Address Translation | PT 6.2.7  PT 6.4.5  PT 6.5.6  PT 6.6.7  PT 6.8.1  Lab 6.8.2  Module 3-5 Exam | 8.70 | Oct 8 | |
| National Day for Truth and Reconciliation (No Classes) | |  |  |  | Sept. 30 | |
| Week 6 | | Wide Area Network Concepts | PT 7.6.1 | 1.20% | Oct 14 | |
| Week 7/8 | | Midterm Project |  | 20% | Oct 28 | |
| Fall Break (No Classes) | |  |  |  | Oct. 11 | |
| Thanksgiving Day (No Classes) | |  |  |  | Oct. 14 | |
| Week 9 | | VPN and IPsec Concepts | Module 6-8 Exam | 1% |  | |
| Remembrance Day (No Classes) | |  |  |  | Nov. 11 | |
| Week 10 | | Quality of Service/  Network Management | PT 10.1.5  PT 10.2.6  PT 10.3.4  Lab 10.4.10 | 5.29% | Nov 12 | |
| Week 11 | | Network Management  Cont. | PT 10.6.10  PT 10.7.6  PT 10.8.1  Lab 10.6.12  Lab 10.8.2 | 6.95% | Nov 12 | |
| Week 12 | | Network Design | PT 11.5.1 | 1.20% | Nov 18 | |
| Week 13 | | Network Troubleshooting | PT 12.5.13  PT 12.6.1  PT 12.6.2 | 3.62% | Nov 25 | |
| Week 14 | | Network Virtualization and Automation | Module 9-12 Exam | 1% | N/A | |
| Week 15 | | Final Project | Module 13-14 Exam | 26% | Dec 9 | |
| Week 16 | |  | Cisco Final Exam | 5% | Dec 11 | |
| VW Deadline for 15-Week Programs | |  |  |  | Nov 15 |
| VW Deadline for 16-Week Programs | |  |  |  | Nov. 21 |
| Last Day of Classes for 15-Week Programs | |  |  |  | Dec 6 |
| Last Day of Classes for 16-Week Programs | |  |  |  | Dec 13 |
|  | Labour Day (No Classes) | | | | | | Sept. 2 |
|  | National Day for Truth and Reconciliation (No Classes) | | | | | | Sept. 30 |
|  | Fall Break (No Classes) | | | | | | Oct. 11 |
|  | Thanksgiving Day (No Classes) | | | | | | Oct. 14 |
|  | Remembrance Day (No Classes) | | | | | | Nov. 11 |

|  |  |
| --- | --- |
| Assessment | Weight |
| Online Module Exams | 5% |
| Packet Tracers | 35% |
| Labs | 10% |
| Midterm Project | 20% |
| Final Project | 25% |
| Cisco Online Final Examination | 5% |
| Total: | 100% |

## Letter Grade Distribution:

[For Pass/Fail courses, delete the Letter Grade Distribution table below and replace the above heading with: Final grade is recorded as Pass or Fail. Where a letter or percentage grade is assigned, delete this text.]

|  |  |  |
| --- | --- | --- |
| Letter | GPA | Percentage |
| A+ | 4.5 | 90 to 100% |
| A | 4.0 | 80 to 89% |
| B+ | 3.5 | 75 to 79% |
| B | 3.0 | 70 to 74% |
| C+ | 2.5 | 65 to 69% |
| C | 2.0 | 60 to 64% |
| D | 1.0 | 50 to 59% |
| F | 0.0 | 0 - 49% |

A grade of 50% is required to pass this course. A minimum grade of 70% is required on the Cisco Final Exam to receive a letter of merit.

Course Policies

## General Academic Policies:

It is the student's responsibility to be familiar with and adhere to the RRC Polytech Academic Policies. These Policies can be found in the RRC Polytech calendar or online under A SERIES – ACADEMIC MATTERS at [rrc.ca/legal/policies](https://www.rrc.ca/legal/policies/).

## Date Revised:

June 20, 2024

Acknowledgements/Frequently Asked Questions

1. Near the end of the course, the student will write an online Cisco final exam. This exam MUST be taken on a specified date and time and invigilated by an authorized Cisco representative. The exam cannot be taken unless these criteria are met. If a student is unable to attend on a specified exam day – sufficient documentation (e.g. doctor’s note) must be provided to the instructor on the first class following the specified exam day. Failure to do so will result in a mark of zero for the Cisco final exam.
2. A minimum mark of 70% must be attained on the Online Cisco Final Examination in order to complete the requirements for the CCNA 2 letter of merit. If a minimum mark of 70% is not achieved on the Online Cisco Final Examination, a single opportunity to re-write the exam will be available. However, on the exam re-write, a minimum mark of 80% must be achieved to receive the letter of merit.
3. Through the Cisco agreements with Red River College Academy – students are not allowed to copy ANY of the Cisco material (either electronically or in printed format). This includes all test material and online material. Failure to honor this policy will result in immediate expulsion from this course and may have serious implications in the event that the student wishes to continue Cisco studies through the Red River College Regional Cisco Academy.
4. The Cisco course material and tests are available online at the following site: <http://www.netacad.com>. Students will be provided a logon id and password. The instructor will ensure that all students can successfully logon to the site during the first class.

Mental Health and Well-being at RRC Polytech

Having good personal health and well-being will support your success in this program.

## We Encourage You To:

• Recognize that stress is an expected part of being a college student.

• Rethink how you view difficulty. Being challenged is actually a part of learning and   
reaching success.

• Reflect on your role in taking care of yourself throughout the term. Do your best to balance your schoolwork and life demands.

• Reach out to your instructor, program coordinator, or College supports at any time if something is affecting your academic performance. It’s always best to reach out early and it’s the responsible thing to do.

## College Supports Ready and Willing to Assist You:

• [Academic Success Centre](https://www.rrc.ca/academic-success/)

• [Campus Well-Being](https://www.rrc.ca/wellness/)

• [Equity, Diversity and Inclusion Supports](https://www.rrc.ca/diversity)

• [Health Services](https://www.rrc.ca/health/)

• [Indigenous Student Supports](https://www.rrc.ca/indigenous/supports/)

• [International Student Supports](https://www.rrc.ca/international/student-support/)

• [Library Services](https://library.rrc.ca/home)

• [Student Accessibility Services](https://www.rrc.ca/accessibility/)

• [Student Counselling Services](https://www.rrc.ca/counselling/)

• [United Way 211 community resource](https://mb.211.ca/)

## Authorization:

This course is authorized for use by:

Name Here  
Chair, Department/Program

Date here  
Date

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Approved by Senior Academic Committee March 2024

Please retain this course outline for future educational and/or employment use.