

**RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE**

NTWK 271 – Routing and Switching Essentials

I. Basic Course Information

- A. Course Number and Title: **NTWK 271, *Routing and Switching Essentials***
- B. New or Modified Course: **Modified**
- C. Date of Proposal or Revision: Semester: **Fall** Year: **2020**
- D. Effective Term **Fall 2021**
- E. Sponsoring Department: **Math & Computer Science Department**
- F. Semester Credit Hours: **3**
- G. Weekly Contact Hours: Lecture: **2 hours**
Laboratory: **2 hours**
Out of class student work per week: **5 hours**
- H. Co-requisite: **NTWK-270 - Introduction to Cisco Networking.**
- I. Laboratory Fees: **NO**
- J. Name and Telephone Number or E-Mail Address of Department Chair and Divisional Dean at time of approval:
Lori Austin – Lori.Austin@raritanval.edu (Chair),
Sarah Imbriglio – Sarah.Imbriglio@raritanval.edu (Divisional Dean)

II. Catalog Description

Co-requisite: *A grade of C or better and a grade of 70% or better on the Final Exam in NTWK-270 - Introduction to Cisco Networking.* This course is the second of four 7½ week courses in the *Cisco Networking Academy*, which is a partnership between RVCC and the Cisco Corporation. This second course covers the architecture, components and operations of routers and switches in a small network. Students will have hands on experience including basic WAN design and implementation in a Laboratory environment including the configuration of several

routers and switches with various routing protocols, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks

III. Statement of Course Need

- A. In the rapidly developing field of data communications and internetworking, Cisco is the dominant equipment vendor in the field. Cisco certification is recognized world-wide as a necessity for a sustained career in Network Design, Implementation, Management and Trouble Shooting. This course will help students learn the basic concepts of Routing and Switching, enabling them to progress to the next level on the path towards Cisco Certified Network Associate (CCENT and CCNA) certifications.
- B. This course does have a Laboratory component. The Laboratory equipment consists of the latest Cisco Routers and Switches which the students use to demonstrate their ability to construct networks and perform basic router and switch configuration.
- C. Most colleges do not accept this course as transferrable. Those that do only accept it as an Elective. However, a student who transfers into a Cisco Academy at another Institution will receive credit for the second course in the CCNA Version 6.0 curriculum at that Institution.

IV. Place of Course in College Curriculum

- A. Free Elective
- B. This course meets a program requirement for:
 - 1. *Computer Networking and Cybersecurity Certificate*
 - 2. *Computer Networking Certificate of Completion – Cisco Emphasis*
 - 3. *Computer Networking AAS*
- C. This course serves as a CIS Elective on the Computer Science Elective List
- D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites

V. Outline of Course Content

Course 2 – Routing and Switching [Cisco CCNA 2 Semester]

- A. Students will gain valuable insights into Networking Protocols and the ability to connect networks with the Internet. The fundamentals of routers and switches will be covered. The major topics covered in this semester are:
 - 1. Basic Switch Configuration

2. Basic Routing Concepts
 3. VLANs and inter-VLAN routing
 4. Static Routing and Dynamic Routing
 5. Single Area OSPF
 6. Access Control Lists
 7. DHCP and NAT for IPv4 networks
- B. Labs will include the creation of small networks, the configuration of routers and switches, and continuation of network troubleshooting using the equipment in the Lab or simulation software.

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes

At the completion of this course, students will be able to:

1. Produce accurate, written Lab Reports in a clear and concise manner. (GE-NJ 1)

B. Course Learning Outcomes

At the conclusion of the course, students will be able to:

1. Describe the basic switching concepts used in Cisco Switches
2. Configure and troubleshoot basic operations of a small, switched network
3. Describe the purpose, nature, and operations of a router
4. Configure the major routing protocols on Cisco Routers
5. Configure and troubleshoot VLANs and inter-VLAN routing
6. Configure, monitor and troubleshoot Access Control Lists for IPv4 and IPv6
7. Configure and troubleshoot Network Address Translation on Cisco Routers

C. Assessment Instruments

1. Exams on each major topic (11 in all). Exams are part of the online tutorial provided by the Cisco Networking Academy Program and therefore are standard across all Academies

2. Laboratory Exercises - Assignments are part of the Academy Program and provide consistency in skill development across all Academies
3. Skills Examination (Successful configuration of Lab Routers and Switches, including ACLs, NAT and DHCP)
4. Final Examination - used to assess the student's mastery of the topics covered in the class. The Final Exam is a product of the Cisco Academy Program

VII. Grade Determinants

- A. Major Topic Exams
- B. Skills Examination
- C. Laboratory Exercises
- D. Final Examination – students must pass the final examination with a 70% or higher in order to proceed to the next 7.5 week course in the series

Methods for teaching and learning that may be used in the course:

- A. Traditional lecture with Slide and Video presentations
- B. Self-learning through an online version of the curriculum delivered by Cisco
- C. Laboratory Exercises on actual hardware (in small groups)
- D. Laboratory Exercises using Simulation Software (individually)

VIII. Texts and Materials

A. Suggested Textbook

Odom, Wendall *Cisco CCNA Routing and Switching 200-120 Official Cert Guide Library* Cisco Press 2013

(Please note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.)

IX. Resources

- A. Access to General Purpose Computers with Internet Access
- B. Access to Cisco Routers and Switches as specified in the Academy Program

C. Access to the Cisco Networking Academy Lab which can be isolated from the RVCC Network

X. Honors Option

N/A