RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

NTWK 119 – Networking Essentials

I. Basic Course Information

A. Course Number and Title: **NTWK 119 – Networking Essentials**

B. New or Modified Course: **Modified**

C. Date of Revised Proposal: Semester: **Fall** Year: **2018**

D. Effective Term: **Fall 2019**

E. Sponsoring Department: **Mathematics & Computer Science**

F. Semester Credit Hours: **3**

G. Weekly Contact Hours: **4** Lecture**: 2**
Laboratory**: 2**
Out of class student work per week: 5

H. Corequisite: ***MATH 020 – Elementary Algebra***

I. Laboratory Fees: **Yes**

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

Corequisite: MATH 020 – Elementary Algebra. This course is based on the industry performance-based COMPTIA Network+ certification. The student will develop knowledge and hands-on skills needed to troubleshoot, configure and manage both wired and wireless networks. In addition, the use of internetworking devices such as routers, and switches will be used to improve network performance. Analyzing existing network configurations, security, and standards will be used to improve network security and scalability.

III. Statement of Course Need

A. Computer Networks are an integral part of everyday life for business, education and pleasure. The explosion of the Internet and growing technologies such as wireless access, virtualization and handheld device connectivity are causing an acute shortage in Network Engineers and Network Designers. This course is the fundamental course in the Networking Curriculum and gives the students a very broad view of all the major technologies involved in the provision of Networks and Network-enabled services. This course also gives sufficient background in other CS programs where a basic knowledge of Computer Networking is required.

B. Students work in a Computer Classroom with access to special software that is used to track data as it flows on the network. The computers are sometimes taken off network to provide troubleshooting experience. Students make networking cables that are used to connect networking equipment.

C. This course transfers to most four-year institutions as either an equivalent course in a Computer Science or related major or as a free elective. See NJTransfer for details of transferability on a college by college basis.

IV. Place of Course in College Curriculum

A. Free Elective

B. This course meets a program requirement for:

1. Computer Networking and Cybersecurity A.A.S.
2. Information Systems and Technology, A.S. and A.A.S. programs
3. Computer Support Certificate
4. Game Development A.A.S.
5. Commercial Energy Management Technology A.A.S. and Certificate

C. This course is an program option in the Interactive Digital Media & Web Development AS, AAS, and Certificate programs.

D. This course serves as a Computer Elective on the Computer and Programming Electives List

E. To see course transferability: a) for New Jersey schools, go to the NJTransfer website, www.njtransfer.org; b) for other colleges and universities, go to the individual websites for those schools.

V. Outline of Course Content

The outline for the course is below. This outline can be adapted by individual instructors according to the order in which they cover content.

A. Network Architecture

1. functions and applications of various network devices
2. Installation and configuration of network devices and services
3. Characteristics and benefits of WAN technologies
4. Network topologies and infrastructures analysis
5. Basic routing concepts and communication technologies
6. Configuration and troubleshooting a basic network
7. Installation and termination of various types and connectors
8. Basic elements of unified communication technologies

B. Network Operations

1. Usage of appropriate monitoring tools
2. Usage appropriate resources to support configuration management
3. Network segmentations
4. Installation of patches and updates
5. Installation and configuration of wireless LAN devices

C. Network Troubleshooting

1. Implementation of network troubleshooting methodology
2. Usage of troubleshooting tools
3. Wireless and wired LAN issues
4. Transmission media (copper and fiber optic cables) issues
5. WAN issues
6. Security issues

D. Network Security

1. Identification of network vulnerabilities, threats and related risk
2. Physical security controls
3. Device hardening techniques
4. Installation and configuration of basic firewall
5. Configuration management and access control models control
6. Basic forensic concepts

E. Network Theory and Industry standards and practices

1. OSI and TCP/IP reference models
2. Network Theory and concepts
3. Wireless LAN standards
4. Wired LAN standards
5. IPv4 and IPv6
6. Layer 2 and 3 networking

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes

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

1. Identify and collect information on network performance and evaluate the information for purposes of basic troubleshooting (GE-NJ IL)

B. Course Learning Outcomes

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

1. Describe the OSI and TCP/IP model's encapsulation process
2. Describe wireless and wired LAN and WAN standards and technologies
3. Install and terminate various types of cables
4. Install, configure and troubleshoot wireless and wired LAN devices
5. Segment a network using VLANs and appropriate IP addressing scheme
6. Identify network vulnerabilities and threats
7. Implement physical security controls and device hardening

C. Assessment Instruments

1. Network Cable Tester – test viability of patch cable (required)
2. Research Papers (optional)
3. Simple Lab results – gather and explain data on network performance (required)
4. Exam questions designed to test abilities in Learning Outcomes 1, 2, and 3 (required)

VII. Grade Determinants

Assessment instruments may include:

A. Quizzes (optional)
B. Periodic Examinations
C. Optional Research Paper
D. Final Examination
E. Homework as assigned from the Textbook and/or Instructor's class notes
F. Class Participation in oral presentations
G. Lab Activities

Modes of teaching and learning:

A. lecture/discussion

B. small-group work
C. laboratory
D. simulations

VIII. Texts and Materials

A. Suggested Textbook: Jill West, Tamara Dean, Jean Andrews. Network+. Guide to Networks. Cengage Learning-Seventh edition, 2016
B. Suggested Textbook**:** Michael G. Solomon, Kim David, Jeffery L. Carrell*. Fundamentals of Communications and Networking.* Jones & Bartlett Learning – Information Systems & Security Assurance Series, Second Edition, 2015
C. Testout: Testout Network Pro
D. Online Videos (streamed from the Internet)

(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. Cable Making Equipment and Tools
B. Optional access to the Cisco Academy Networking Lab in WTC120
C. The Library – for optional research projects
D. Internet Access

X. Honors Option

N/A