RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

CISY 119 – Networking Essentials

I. Basic Course Information

A. Course Number and Title: **CISY 119 - Networking Essentials**

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

C. Date of Revised Proposal: Semester: **Spring**   Year: **2017**

D. Effective Term: **Fall 2017**

E. Sponsoring Department: **Computer Science (CS)**

F. Semester Credit Hours: **3**

G. Weekly Contact Hours: **4**   Lecture**: 2**
                                      Laboratory**: 2**
                                      Out of class student work per week:6

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

I. Laboratory Fees: **Yes, at current rate**

J. Name and Telephone   **Steven Schwarz,**
   Number or E-Mail   **Steven.Schwarz@raritanval.edu**
   Address of Department
   Chair at time of approval

II. Catalog Description

Prerequisite/Corequisite: MATH 020 – Elementary Algebra. This course introduces the student to basic concepts and operations of computer networks.
Particular emphasis is placed on demonstrating how important Networks, and especially the Internet, have become for today's global businesses. Networks are examined from the SOHO (Small Office Home Office), SMB (Small and Medium Business), and Enterprise (very large networks) perspective. Network topologies and protocols are examined for LANs (Local Area Networks) and WANs (Wide Area Networks) and the Internet. The OSI and TCP/IP reference models serve as a foundation for understanding networking in the 21st Century. The concepts of Network Design, Network Management and Network Security are introduced.

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 in order to provide trouble shooting 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 A.A.S.
    2. Computer Networking and Security Certificate
    3. Information Systems and Technology, A.S. and A.A.S. programs
    4. Computer Support Certificate and Certificate of Completion
    5. Game Development A.A.S.

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 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. Evolution of Communications
        1. Impact of WWW on Business

~~2.~~ ~~Solving Enterprise Business Communication Challenges~~
~~3.~~ ~~Solving Government, SOHO, SMB Business Communication~~
~~Challenges~~
    2. Circuit Switched, Packet Switched and IP based Communication

  B. Fundamentals of Networking
    1. Evolution of Ethernet
    2. Repeaters, Bridges, Hubs, Switches and Layer 3 devices
    3. Faster and faster speeds
    4. OSI and TCP/IP Reference Models
    5. IPv4 and IPv6
    6. Layer 2 Networking
    7. Virtual LANs (VLANs)
    8. Layer 3 Networking (routing basics)
    9. Wireless LANs
    10. Voice over IP (VoIP)
    11. Unified Communications
  C. Network Management, Performance and Security
    1. Fault Management and Best Practices
    2. Configuration Management and Asset Control
    3. Change Management
    4. Performance Management (measurement, monitoring, improvements)
    5. Security Management approaches

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 Reference Model including the name and function(s) of each layer in proper order
2. Describe the TCP/IP Communications Model including the name and function(s) of each layer in the proper order
3. Describe the differences among LANs, WANs, PLANs and give examples of Communication Protocols for each

4. Construct a Straight-Through or Cross-Over Patch cable and demonstrate its viability

C. **Assessment Instruments**

A. Network Cable Tester – test viability of patch cable (required)
B. Research Papers (optional)
C. Simple Lab results – gather and explain data on network performance (required)
D. 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**:** Solomon, Michael, Kim, David, Carrell, Jeffrey. *Fundamentals of Communications and Networking.* Jones & Bartlett Learning – Information Systems & Security Assurance Series, Second Edition, 2015

B. 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 (w108)
C. The Library – for optional research projects
D. Internet Access