This effort aligns with RCC’s strategic plan Goal 4: To systematically and proactively support students in identifying, formulating and accomplishing their learning, career and personal goals, Strategy C) To continually find new ways to integrate curricular, career and student support services, Objective 2: Connect curriculum with careers. Activity: Develop workforce certificate Computer Technician and courses, to be a stackable certificate into the Network Administration (Certificate and AS Degree). (Pages 28 and 29 of the RCC Strategic Plan, Action Plans – Year 2)

Network Fundamentals is one of the required courses for the AS and certificate degree programs.

8 Instructional Objectives

The method of instruction will consist of lectures, classroom discussions, lab, Cisco’s online learner management system and homework assignments. Students are expected to come to class prepared by reading the chapters. Hands on learning tools will be used to support hands on learning. Hands-on interactive activities and troubleshooting hardware and software simulation will supplement classroom learning. Activities are designed to allow for alignment to CompTIA A+ essentials and Network + certification objectives. There will be significant class time spent demonstrating the practical use of these tools. Review assignments and readings will be assigned to help support and supplement the material found in the text. A final project will be given to students to work in teams, and present before their peers.

1 Students will demonstrate their knowledge of networks and routers concepts by designing and configuring basic networks

2 Students will learn effective communication, interpersonal relation, and teamwork skills by completing class and lab assignments emphasizing these skills and then working in teams or individually to complete assigned projects.

3 Students will develop critical thinking and analytical problem solving skills by analyzing problem scenarios and developing appropriate solutions.

4 Students will learn basic customer service skills by working on team projects and simulations

9 Learning Outcomes

Upon completion students will able to:

- Describe network protocol models and explain layers of communications, data transfer and network access points in data networks
• Calculate, design, and apply subnet masks and addresses to a network of computers and other hardware
• Build and configure a fully functional simple Ethernet network using routers and switches
• Employ basic cabling and network designs to connect hardware devices
• Demonstrate the use of Cisco CLI commands to perform basic router and switch configuration and verification
• Analyze and describe the operations and feature of the transport and network layer protocols and services

10 Instructional Methods and Materials

2. Lectures/Demonstrations: Important material from the text and outside sources will be covered in class. You should plan to take careful notes as not all material can be found in the texts or readings. Discussion is encouraged as is student-procured, outside material relevant to topics being covered.

2. Assignments: Lab assignments and projects found in the text will be periodically assigned to help support and supplement material found in the lessons. These assignments may require the application of various software applications.

3. Quizzes: Occasional unscheduled quizzes may be given to help ensure you stay up with assigned material.

4. Exams: Two part exams will be given. The midterm exams will be project based. One will be done individually, and the other as a team. This will test assigned readings and material discussed in class. A final exam will also be given

11 Text and Other Materials:

• Network Fundamentals - CISCO Text, Handouts

• Lab PC repair tool kit, (Software and Hardware provided in class)

• One 4gig Jump Drive

Project files: Instructor will provide instructions for obtaining the Project files.

Handouts: Additional handouts may be required. Instructor will provide information on obtaining this material.
Web Site
Supplementary information for the course is available at [https://www.cisco/academy/]. The Web site may contain class notes, PowerPoint slides, class announcements, the course syllabus, test dates, and other information for the course.

12 Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
<th>Lab Assignments</th>
<th>Due date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Living in a Network Center World</td>
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<tr>
<td>2</td>
<td>Communicating over the Network</td>
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<td>3</td>
<td>Application layer functionality and Protocols</td>
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<tr>
<td>Quiz I</td>
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<tr>
<td>4</td>
<td>OSI Transport Layer</td>
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<tr>
<td>5</td>
<td>OSI Network Layer</td>
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<tr>
<td>6</td>
<td>Addressing the Network – Ipv4</td>
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<td>Quiz II</td>
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<td>7</td>
<td>Data Link Layer</td>
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<tr>
<td>8</td>
<td>OSI Physical Layer</td>
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<td>9</td>
<td>Ethernet</td>
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<tr>
<td>Quiz III</td>
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<td>11</td>
<td>Planning and Cabling Networks</td>
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<td>11</td>
<td>Configuring and Testing your Network</td>
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<tr>
<td>12</td>
<td>Additional topics</td>
<td>HANDOUTS</td>
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<tr>
<td>Final Exam</td>
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<tr>
<td>Final</td>
<td>CCNET Exam Preparation</td>
<td>HANDOUTS</td>
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</tbody>
</table>

13 Plan for Evaluating Student Outcomes:
Students will be evaluated based on their combined performance on homework assignments and exams. The Assignment Sheet will enable easy tracking of progress and grades.

Your ability to understand and follow the directions in the text thoroughly will be an essential component for successful completion of the projects/homework. Every lab assignment from the textbook will have at least one scenario to accompany it. These projects can be used as tools for you and your instructor to evaluate the accuracy and completeness of each assignment.
The following grading scale will be used:

<table>
<thead>
<tr>
<th>Percentage of Possible Points</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>96-100%</td>
<td>A</td>
</tr>
<tr>
<td>92-95%</td>
<td>A-</td>
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<tr>
<td>88-91%</td>
<td>B+</td>
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<tr>
<td>84-87%</td>
<td>B</td>
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<tr>
<td>80-83%</td>
<td>B-</td>
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<tr>
<td>76-79%</td>
<td>C+</td>
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<tr>
<td>72-75%</td>
<td>C</td>
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<tr>
<td>68-71%</td>
<td>C-</td>
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<tr>
<td>64-67%</td>
<td>D+</td>
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<tr>
<td>61-63%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

Letter grades will be determined using a standard percentage point evaluation as summarized below:

35% of the grade is based on a midterm and a final examination. Both examinations are cumulative and given in a varied format. An in-class review will be held prior to each examination.

10% of the grade is based on quizzes. Quizzes are announced one day in advance and may vary in format.

45% of the grade is based on hands-on lab projects and activities

10% See presentation rubrics

14 Library, TLC, or other required institutional resources

This course will require the support of the IT department, Library and TLC. Copies of the text will be placed in circulation department of the library. Students will use the college’s computer labs and learning center resources
ROXBURY COMMUNITY COLLEGE
NEW COURSE PROPOSAL

1 Course Name:
Routing Protocols and Concepts

2 Course Number:
IST 143

3 Course Credit:
4Cr

4 Course/Catalog Description:
This course provides specifics in how routers communicate with each other, disseminating information that enables them to select routes between any two nodes on a computer network. We will utilize Cisco’s online learner management system as well as Cisco packet tracer activities and internetworking hardware to gain hands-on experience in designing and configuring networks. Topics includes: router components, configuring and verifying routers, IOS, TCP/IP, addressing, routing protocols, classless IP and more.

5 Prerequisites:
ENG 091 eligible; IST 142 or permission of instructor

6 This Course is a requirement for the following programs:
Network Administration
Can be taken as an IST elective within the IST programs

7 Narrative Rationale and Justification
In an effort to meet student and industry demands for certified Network Engineers and Technicians, as well as a transferable AS degree in Network Administration, the IST Department proposes to introduce a revised Network Administration AS degree and Certificates. Where possible the new degree/certificate programs will be geared to meet articulation agreements, industry certification standards and guidelines. It will offer a smooth transition to the University of Massachusetts Boston towards a four year Bachelor’s degree in BSIT (BS in Information Technology) and it will be transferable to other public or private colleges and universities.
This effort aligns with RCC’s strategic plan Goal 4: To systematically and proactively support students in identifying, formulating and accomplishing their learning, career and personal goals, Strategy C) To continually find new ways to integrate curricular, career and student support services, Objective 2: Connect curriculum with careers. Activity: Develop workforce certificate Computer Technician and courses, to be a stackable certificate into the Network Administration (Certificate and AS Degree). (Pages 28 and 29 of the RCC Strategic Plan, Action Plans – Year 2)

Routing and Protocols is one of the required courses for the AS and certificate degree programs.

8 Instructional Objectives

The method of instruction will consist of lectures, classroom discussions, and classroom and homework assignments. Students are expected to come to class prepared by reading the chapters. Hands on learning tools will be used to support hands on learning. E-doing interactive activities and Packet Tracer network simulation will supplement classroom learning. Packet Tracer activities will be designed to allow for alignment to ComTIA and CCNA networking certification objectives. There will be significant class time spent demonstrating the practical use of these tools. Review assignments and readings will be assigned to help support and supplement the material found in the text. A final project will be given to students to work in teams, and present before their peers.

1. Students will demonstrate their knowledge of networks and routers concepts by designing and configuring basic networks, and implementing basic routing

2. Students will learn effective communication, interpersonal relationship, and teamwork skills by completing class and lab assignments emphasizing these skills and then working in teams or individually to complete assigned projects.

3. Students will develop critical thinking and analytical problem solving skills by analyzing problem scenarios and developing appropriate solutions.

4. Students will learn basic customer service skills by working on team projects and simulations

9 Learning Outcomes

Upon completion students will able to:

- Demonstrate learning by configuring and verifying router interfaces, devices and data ports
- Explain and apply comprehensive Routing Information Protocol Version 1 (RIPv1) configuration skills in a network environment
- Design and implement classless IP addressing scheme for a network
• Apply advanced configuration commands with router implementing EIGRP in a network environment
• Perform basic RIPv2 configuration commands on a network resulting in basic route communications between devices
• Verify and evaluate RIPv2 classless routing updates
• Identify the characteristics of distance vector routing protocols

10 Instructional Methods and Materials

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