# COMMUNITY COLLEGE
## OF RHODE ISLAND

**Networking 3      CNVT 1830 Section 108 Fall 2024**

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|---|---|
| **Instructor** | John Mowry |
| **Telephone** | 401-825-2138 |
| **E-mail** | jmowry@ccri.edu   If you put @my.ccri.edu, you will be sending an email to a student at CCRI and not to me. Any time you want to email me for this class, you **must** have **CNVT-1820-104** in the subject. If you do not do this, I may not give you a response within 24 hours. I do not answer emails between 9 pm and 8 am on Monday to Saturday; or on weekends at any time. |
| **Office Hours** | See Office Door (Knight Campus Office 2126) |
| **Class Sections** | 108 Thursday 6:00 PM-9:50PM, starts 9/5 ends 12/19 |
| **Credit Hours** | 3 Credit Hours, 2 Lecture Hours & 2 Laboratory Hours per week, based on a fifteen-week schedule. |
| **Administrative Assistant** | Donna Scattone  (825-2155) |

## Instructional Material and Web Sites

| | | |
|---|---|---|
| 1 | CCRI Lesson Web Site | www.netacad.com (Enterprise Networking, Security, and Automation v7.2 (ENSA)) |
| 2 | Cisco Academy Assessment Web Site | http://netacad.com |
| 3 | J Mowry CCRI Website | https://www.ccri.edu/faculty_staff/comp/jmowry |
| 4 | Blackboard | www.blackboard.ccri.edu Material including PowerPoint slides and Grading will be also available here. Detailed material as well as full-instructional material will be available on the Cisco Netacad website listed above. All exams will be administered through the Netacad website. |

**Mission of the Computer Science Department:**

The mission of the Computer Studies and Information Processing Department at the Community College of Rhode Island is to provide high quality education in the areas of computer science and information technology to a diverse student population. We offer programs of study that provide our students with the skills necessary for transfer, career success, and lifelong learning. With programs in: Cybersecurity, Computer Support Specialist, Networking Technology, Computer Programming, and Web Technologies we offer a variety of options in the fields of computer science and information technology.

The Community College of Rhode Island has been designated as a National Center of Academic Excellence in Cyber Defense 2-Year Education through the academic year 2028 for the Associate in Science, Cybersecurity program.

The Community College of Rhode Island is now officially listed as an NSA/DHS CAECDE at the NSA/DHS.

**Course Description:** Describes the architecture, components, operations, and security to scale for large, complex networks, including Wide Area Networks (WAN) technologies. Emphasizes network security concepts and introduces network virtualization and automation. Students will learn how to configure advanced routing and switching protocols; identify threats and enhance network security; implement IPv4 Access Control Lists (ACL's); configure Network Address Translation (NAT) services; explain virtualization, software defined networking, and automation.

**Course Delivery Mode:** The course is comprised of both Lecture and Laboratory. There will be both an on-line final as well as a Practical, Hands-On final. All exams will be taken In-Person.

**Course Expectations:** Students are to follow the rules and regulations as outlined in the Student Handbook, available on-line at:
http://www.ccri.edu/advising/student_services/handbook.html

**Additional Learning Material:**
Textbook, (Not Required) (All reading material is available on the Netacad website.)
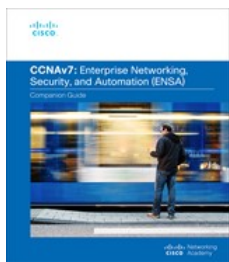


Enterprise Networking, Security, and Automation Companion Guide (CCNAv7)

By Cisco Networking Academy
Published Jul 16, 2020 by Cisco Press. Part of the Companion Guide series.

- ISBN-10: 0-13-663432-X
- ISBN-13: 978-0-13-663432-4

**Grading Policies**
  **Skills:**
  Journal-Entries          5%     <mark>Due: Evening of assigned Practical Exam</mark>
  Labs and Class          10%
  Participation
  Practical Final         35%
  Case-Study              10%     <mark>Due: December 5, 2024 @ 9:50 PM</mark>
  **Academic:**
  Quizzes                 10%
  Final                   30%

**Final Grades:** Final grades will be calculated using a mathematical scale utilizing statistical Standard-Deviation methods. <mark>The following chart is for reference purposes only!</mark> Your instructor reserves the right to evaluate and adjust final grades.

<u>Grading Scale</u>:

| Percentage | Letter Grade |
|---|---|
| 94% - 100% | A |
| 90% - less than 94% | A- |
| 87% - less than 90% | B+ |
| 84% - less than 87% | B |
| 80% - less than 84% | B- |
| 77% - less than 80% | C+ |
| 70% - less than 77% | C |
| 67% - less than 70% | D+ |
| 60% - less than 67% | D |
| Below 60% | F |

**Verification of Enrollment:** Per federal financial aid regulations, CCRI is required to verify student enrollment. All faculty members are required to complete a verification of enrollment per the dates in the <u>College Calendar</u>. Students can confirm enrollment through attendance at any academically related activity, a sign-in sheet will be available each class, or by emailing me explaining why you have not attended class or completed the labs in the first week.

**Incomplete Grade:**

This temporary grade designation is awarded at the end of a course. It is awarded only when a student is PASSING, has completed at least 75 percent of the course and is unable to complete the course due to extenuating circumstances (e.g., illness, death, unforeseeable accident, unavoidable circumstance).

**Late Assignments:**

Since this course would meet 4-hours in person and have 8-hours of reading or homework per-week, you are expected to be putting in 12-hours on this course per college policy. All assignments to be turned in to the instructor will have a due-date prescribed and late assignments will be graded at 75% accordingly at the discretion of your instructor.

**Attendance:**

Attendance is required and all physical labs will be completed in the CCRI laboratories without exception. In-person labs that are completed on any simulator and not on the physical networking equipment in the CCRI laboratories, will not be accepted. Students are expected to attend all class meetings in-person. **A maximum of three unexcused absences will result in the student receiving a withdrawal, either a WF or a WP, from the course! Students can inform the instructor prior to an absence that cannot be avoided.**

**Course Outcomes:**

**As a result of this course, a student will be able to:**

- explain and configure dynamic routing protocols in both point-to-point and multiaccess networks
- describe how to mitigate threats and enhance network security, implement security using access control lists and security best practices
- configure NAT services on the edge router to provide IPv4 address scalability
- demonstrate techniques to provide address scalability and secure remote access for WANs
- describe how to manage, optimize using Quality of Service (QoS), monitor, and troubleshoot scalable network architecture
- explain how technologies such as virtualization, software defined networking, and automation affect evolving networks

**Time Management**

1. Course will meet for two (2) Lecture Hours and, two (2) laboratory hours per week of instruction. Based on a 15-week schedule. Shorter courses will meet respective to the number of class meetings
2. Course will meet for sixty (60) hours of combined instruction and laboratory exercises.
3. Students are expected to spend an equal amount of time (60 hours) in reading the curriculum, and studying related material in addition to the required lecture/laboratory.
4. All Packet Tracer lab activities are to be completed as homework assignments
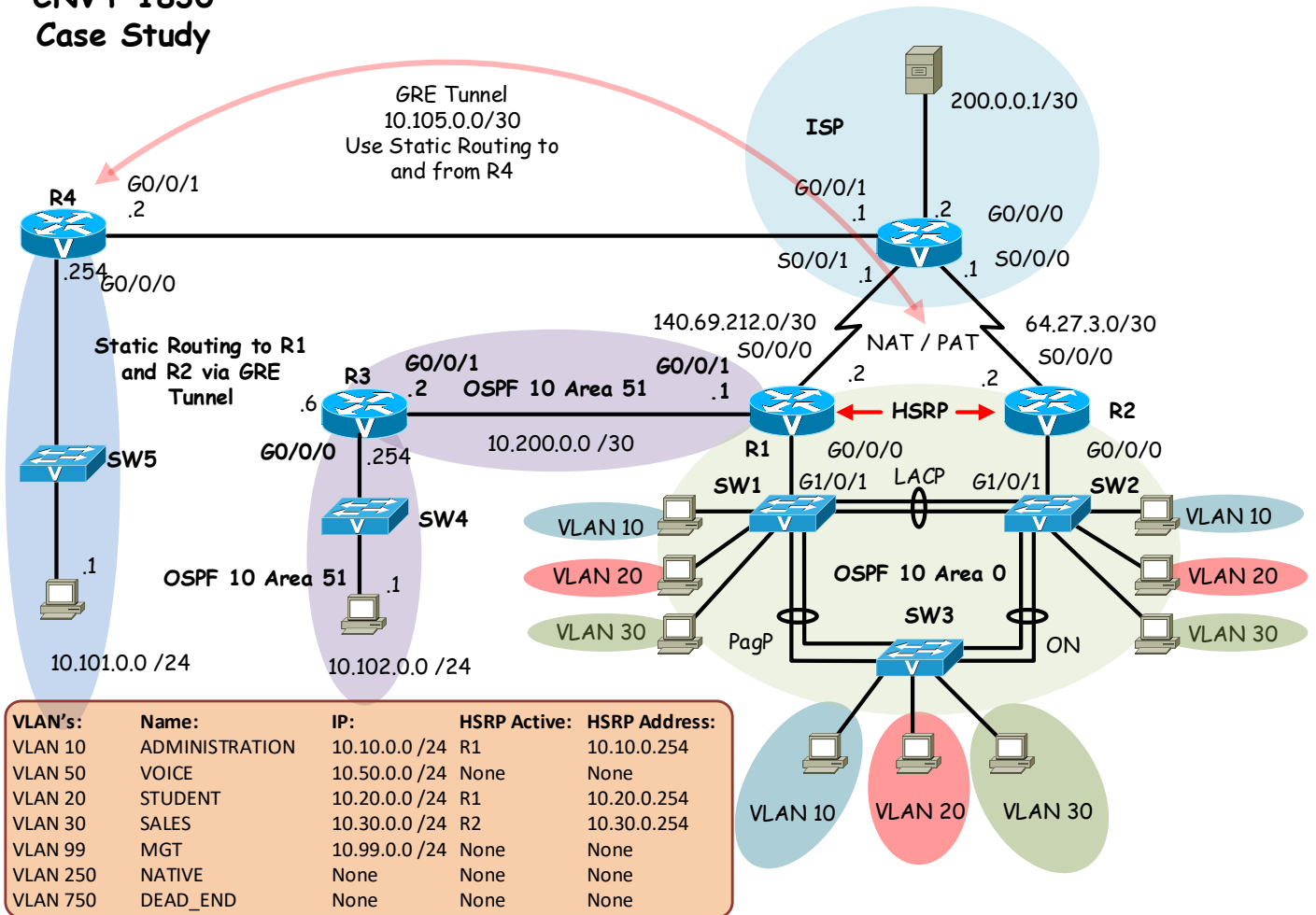
**Practical Exam**

1. The practical exam will encompass a majority of concepts and procedures developed during the laboratory experiments and required readings.
2.  The practical exam will be totally "hands-on" including routing and switching equipment as well as IP Addressing and programs specifically related to the remote configuration of networking devices.
3. Absolutely no forms of electronic media or other forms of notes or assistance are permitted.

**Case Study:**

Students will work in assigned groups to complete the case study. Each group will present their solution via PowerPoint, as well as a printed copy of all configurations and any additional relevant material. The printout must list the group member names, what each member was responsible for, and be typed using Word or a PDF format in a 12pt font. **The printout is not a copy of the presentation slides!**

# CNVT 1830 - Case Study

**CNVT 1830
Case Study**

GRE Tunnel
10.105.0.0/30
Use Static Routing to
and from R4

**ISP**

200.0.0.1/30

R4   G0/0/1
.2

G0/0/1
.1          .2   G0/0/0

.254 G0/0/0          S0/0/1          S0/0/0
.1                   .1

Static Routing to R1
and R2 via GRE
Tunnel

140.69.212.0/30          64.27.3.0/30
S0/0/0   NAT / PAT   S0/0/0

R3   G0/0/1
.2          .1
.6   OSPF 10 Area 51   G0/0/1          HSRP          R2
.2          .1

SW5          G0/0/0          10.200.0.0 /30
.254          R1          G0/0/0          G0/0/0

SW4          G0/0/0          G1/0/1   LACP   G1/0/1          SW2
SW1

.1          OSPF 10 Area 51          VLAN 10          VLAN 10
.1          VLAN 20          OSPF 10 Area 0          VLAN 20

10.101.0.0 /24          VLAN 30          SW3          VLAN 30

10.102.0.0 /24          PagP          ON

| VLAN's: | Name: | IP: | HSRP Active: | HSRP Address: |
|---------|-------|-----|--------------|---------------|
| VLAN 10 | ADMINISTRATION | 10.10.0.0 /24 | R1 | 10.10.0.254 |
| VLAN 50 | VOICE | 10.50.0.0 /24 | None | None |
| VLAN 20 | STUDENT | 10.20.0.0 /24 | R1 | 10.20.0.254 |
| VLAN 30 | SALES | 10.30.0.0 /24 | R2 | 10.30.0.254 |
| VLAN 99 | MGT | 10.99.0.0 /24 | None | None |
| VLAN 250 | NATIVE | None | None | None |
| VLAN 750 | DEAD_END | None | None | None |

VLAN 10   VLAN 20   VLAN 30

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**Notes:**
R1 OSPF:
Designated Router for:
VLAN's 10, 20
Backup Designated Router for:
VLAN's 30, 99
R2 OSPF:
Designated Router for:
VLAN's 30, 99
Backup Designated Router for:
VLAN's 10, 20

**Ether-Channel SW1 – SW2:**
SW1  Ports G1/0/2-3
SW2  Ports G1/0/2-3
LACP
**Ether-Channel SW1 – SW3:**
SW1  Ports G1/0/4-5
SW3  Ports G1/0/2-3
PagP

**Ether-Channel SW2 – SW3:**
SW2  Ports G1/0/4-5
SW3  Ports G1/0/4-5
ON

**Case Study Requirments:**

1. All traffic from the 10.101.0.0/24 network will return to the central network by the GRE VPN tunnel of 10.105.0.0/30 network address space via static routing.
2. All traffic going to the 10.101.0.0/24 network will use static routing over the GRE VPN and be redistributed within the OSPF routers,
3. All traffic leaving the network will exit via the HSRP virtual interfaces.
4. R1 will be the Active Router for HSRP as well as the OSPF Designated Router for VLAN's 10 and 20, R2 will be the HSRP Backup.
5. R2 will be the Active Router for HSRP as well as the OSPF Designated Router for VLAN's 30 and 99, R1 will be the HSRP Backup.
6. Ether-Channel will be configured according to the chart above.
7. All Access ports should be set to protect Spanning-Tree and unused ports should be disabled and placed into VLAN 750.
8. All other security measures applicable, should be applied to all Access ports.
9. Access Control Lists should be places on all routers to protect against outside attacks as well as limit remote access to SSH and/or CDP
10. All traffic should use NAT/PAT to external addresses assigned by your company from the IANA IPv4 address space of 175.44.2.0/29
11. Use the 175.44.2.1 address as the static NAT address for the 10.102.0.1 Web server including PAT.
12. Reserve three (3) addresses for future expansion.
13. All access addresses except for the Web server should be via DHCP with a domain of jmowry.com, a lease of three (3) days, and DNS of 8.8.8.8 and 8.8.4.4.

**Journal-Entries:**

The Journal is your **Notebook.** The Notebook is to be Hand-Written and presented to your instructor on the date specified. No electronic method of taking notes will be accepted. The Notebook must have your name clearly printed on the front cover, either inside or outside, or if using a binder on the first page.

**Examinations**

1. All exams, excluding the practical exam, will be a combination of multiple choice, fill-in the blank, matching as well as simulations.

**Other Policies**

1.  The student expected to complete the On-Line lessons outside of class time.
2.  All quizzes must be taken in class and will not be available from the student web site
3.  After the listed due date, late submissions (up to one week) will be graded at 75%
4.  Assignments submitted more than one week after the listed due date will receive a grade of zero.
5.  All assignments must be completed using a word processor.
6.  Students are responsible to see the instructor about any work missed due to absence.
7.  Students who miss a quiz must take the quiz within two classes of the original quiz date.
8.  Students are expected to participate as a member of teams
9.  Students must pass both the Skills based portion in addition to the Academic portion of the curriculum to pass the course.
10. Student's final grade can only raise one letter grade above the on-line final exam score based on other class assignments.
11. Students are allowed a **maximum** of three (3) re-takes of chapter quizzes per the semester.
12. All re-takes must be completed **prior** to the final exam, **without exception**.

**Services for Students with Disabilities:**

Any student with a documented disability may arrange reasonable accommodations.  As part of this process, students are encouraged to contact the office of Disability Services for Students as early in the semester as possible (http://www.ccri.edu/dss/index.shtml).
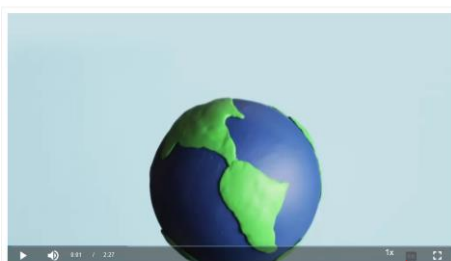
**Enabling Closed Caption:**

All embedded videos on the Cisco Academy website have the ability to display closed captioning in multiple languages. The procedure to enable this feature is as follows;



Closed Caption Option



When selected the user can choose what language they would like to see displayed from available languages.
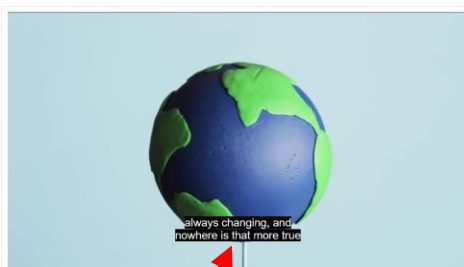


After selecting "English" the appropriate text is now displayed. ***This needs to be done for each embedded video individually.***

**Netiquette Policy**:

- Respect others and their opinions. In online learning, students from various backgrounds come together to learn. It is important to respect their feelings and opinions though they may differ from your own.
- Tone down your language. Given the absence of face-to-face clues, written text can easily be misinterpreted. Avoid the use of strong or offensive language and the excessive use of exclamation points. Review before posting to remove any strong language.
- Keep personal discussions off the class discussion board.
- Do not type all capitals, which is difficult to read, and has come to be considered the electronic version of "shouting."
- Do be courteous, even when you disagree, with your instructors as well as your classmates, and always provide clear, logical support for your views.
- Avoid inappropriate material.
- Be forgiving. If someone states something that you find offensive, mention this directly to the instructor. Remember that the person contributing to the discussion might be new to this form of communication. What you find offensive may quite possibly have been unintended and can best be cleared up by the instructor.
- Think before you hit the send button. Think carefully about the content of your message before contributing it. Once sent to the group there is no taking it back. Grammar and spelling errors reflect on you and your audience might not be able to decode misspelled words or poorly constructed sentences. It can also adversely affect your grade.
- Escalate your issues privately via email versus discussion forums. Should you have a disagreement with an instructor or classmate it is best to send an individual email to that individual. Do not argue your case in the discussion forum.
- Brevity is best. Be as concise as possible when contributing to a discussion. Your points might be missed if hidden in a flood of text.

Avoid disciplinary action. Any type of online behavior that is perceived as disrespectful to a fellow student or instructor, or anything that has the potential to be perceived as less than courteous is unacceptable and can be subject to disciplinary action by the Chair of the department. Repetition of such behavior can result in expulsion from the class.

**Technical Requirements:**

Learning requires certain technical requirements to participate actively and be successful. At the minimum, students must have access to a computer and stable Internet connection. Many courses at CCRI require certain technical requirements to participate actively and be successful. View Set Up Your Tech to learn more about technical requirements.

**CISCO Netacad**:
Students need a stable Internet connection. Chrome, Firefox, or Edge web browsers can be used. You should clear your web browser cache, which is found in the settings of the web browser. If you do not do this, some of your labs will not work correctly. Chromebooks will not work for your labs. You must have a computer/laptop running Windows 10 or better or MAC.

**CCRI Computer Labs**:
The academic computer lab is available for CCRI students and allows access to computers with required software. Information regarding CCRI's academic computer labs is available at the following link: [Academic Computer Labs](#).

**MS Office 365**:
Microsoft Office 365 is available for all CCRI students to download. This version of Office will be accessible as long as you are actively enrolled at CCRI. It is recommended that students [download MS 365 to their computers](#) for access to MS Word, PowerPoint, and Excel offline. If you use other programs, I may not be able to open the files.

**MS OneDrive**:
[OneDrive](#) is a clouded-based storage system that lets CCRI students store, share and organize files, photos and favorites on Windows servers, and access them from any computer with an Internet connection. You will need and know how to use a computer or mobile device with Internet access. You will also need one of the following web browsers: Edge, Firefox, Chrome, or Safari (Mac only). However, if you put something into OneDrive, you must give me permission to access the file. Once I click on allow, you will get an email that you give permission again before I can view the data.

**Academic Integrity**:
Academic integrity is vital to an institution of higher education. The integrity of your work – that it represents your independent thought and effort and that it properly acknowledges the work of others – is essential to the awarding of credit and to the development of your academic potential. As such, instances of academic dishonesty – cheating, plagiarism, etc., – are extremely serious academic offenses that should not be overlooked. Students should be aware and regularly cautioned that violations of academic integrity may result in suspension or expulsion from the college. For more information, go to the CCRI's Policy on Academic Integrity.

**Managing Life Crisis and Finding Support**:
Should you encounter an unexpected crisis during the semester (i.e., securing food or housing, addressing mental health concerns, personal safety, managing a financial crisis, and/or dealing with a family emergency, etc.), please reach out to the office of Community and Social Resources. If you are uncomfortable doing so on your own, please know that I can submit a referral on your behalf—just email me or schedule a meeting with me during my office hours.

**Veteran Services**:
CCRI Veteran Services Office is committed to being a resource to all VA education beneficiaries. Our mission is to assist veterans, service members, and dependents in the pursuit of their educational goals by maintaining up-to-date information on current programs and resources. Through a combination of experience with the educational system and contacts within the VA, we can help you with any aspect of your higher education.

**Mental Health Services**:
CCRI is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available.
CCRI has partnered with MySSP (My Student Support Service) to provide 24/7 mental health and well-being support to students, including real-time and scheduled access to professional counselors. All services are confidential and 100% FREE to CCRI students!
In addition to MySSP, the Advising and Counseling Center provides one-on-one and group counseling for a variety of problems ranging from typical difficulties students experience (e.g., adjustment to the college setting) to problems associated with acute or long-standing psychological disturbances. For a listing of mental health services on and off campus, visit Mental Health Services.

**Student Success Center**:
The Student Success Center provides academic assistance through tutoring services; coordinate information and referrals to college resources; seek ways to improve student satisfaction and retention; and help students achieve their goals. Student Success Center staff members help students understand their individual learning needs, develop better study habits and behaviors, and create plans to achieve their goals. For more information about our services, email successcenter@ccri.edu or visit the website. Watch this video, to learn how to book Free CCRI tutoring appointments through Starfish.

**Writing Center**:

The Writing Center offers a variety of free services, including online and in-person help with prewriting, organization, thesis statements, topic sentences, research papers, revision/editing, and answers to questions. Online help at [Writing Center](#) includes:

- Zoom links for Writing Center Virtual Drop-in Tutoring Sessions
- Virtual Zoom appointments
- Email responses to questions and help with papers
- Website content, such as handouts, practice quizzes, literature analysis, PowerPoint presentations, reading resources, and information about research papers (MLA, APA, and Chicago systems)

In-person appointments can be made by contacting [writingcenter@ccri.edu](mailto:writingcenter@ccri.edu).  The Writing Center is available at three of our four campuses to assist CCRI students, faculty, and staff members with different kinds of writing and revision tasks.

**Religious & Cultural Observance**:

Persons who have religious or cultural observances that coincide with this class should let me know in an email during the first two weeks of the semester. However, if I do not hear from you by the end of the second week of school, I will assume you plan on doing the work for the week.

**Explicit Content**:

If you are aware of cognitive or emotional triggers that could disrupt your intellectual or mental health, please let me know so that I can be aware in terms of course content.

**Title IX and Gender Pronouns**:

This course affirms equality and respect for all gendered identities and expressions. Please don't hesitate to correct me regarding your preferred gender pronoun and/or name if different from what is indicated on the official class roster. Likewise, I am committed to nurturing an environment free from discrimination and harassment. Consistent with Title IX policy, please be aware that I, as a responsible employee, am obligated to report information that you provide to me about a situation involving sexual harassment or assault.

**Advising***:*

Your success is the primary focus of the [Advising Center](#). As such, all matriculated students are assigned a trained, professional advisor who will provide support, guidance, and resources to help you navigate your academic journey and maximize your educational experience during your entire time at the Community College of Rhode Island. Recognizing the diverse needs of our student body, your assigned advisor will provide personalized assistance to ensure that your academic, personal, and career goals are met. The services available to you include academic planning and course selection; transfer planning; assistance in understanding college policies and procedures; and referrals to on-and-off-campus resources. Connecting with your assigned advisor is easy. Log in to your Starfish account (include instructions here). We look

forward to partnering with you in your journey towards success at the Community College of Rhode Island.

**Counseling*:***
CCRI offers short term and confidential counseling to help students with mental health concerns. The Personal Counseling and Wellness Office offers students a safe environment for one-on-one appointments, assisting with a variety of concerns related to anxiety, depression, or long-standing psychological obstacles. The Personal Counseling and Wellness Office also assists with connecting students with resources and outside agencies offering long-term counseling services. For a list of mental health services on and off campus, please visit [Personal Counseling and Wellness](#).

Finally, counseling services are offered at our four main campuses (Warwick, Lincoln, Providence, and Newport) M-F 8:00 am to 4 pm. To schedule an appointment, please email us at: [counseling@ccri.edu](mailto:counseling@ccri.edu)

**TELUS Health*:***
CCRI has also partnered with TELUS Health, a counseling service available to students 24/7, free of charge. TELUS Health offers virtual walk-in's and scheduled appointments, with access to professional counselors. To learn more about TELUS Health, please click the link here: [visit TELUS Health](#)

**The Benefits Hub*:***
The Benefits Hub connects students to on and off campus resources. If students are couch surfing,need groceries,childcare, transportation, or some other form of assistance, please contact: 401.825-1024 (office), or [BenefitsHub@ccri.edu](mailto:BenefitsHub@ccri.edu) If you are uncomfortable doing so on your own, please know that I can submit a referral on your behalf - just email me or schedule a meeting with me during office hours.

**Tutoring Center*:***
Students use Starfish to schedule appointments to meet with CCRI tutors and academic coaches. Appointments are offered in-person and online with day, evening, and weekend availability. All services are at no cost to students.
Visit [The Tutoring Center](#) or email [tutoring@ccri.edu](mailto:tutoring@ccri.edu) to learn more about our services.

**Connect with a Tutor*:***
CCRI employs tutors recommended by CCRI faculty to provide tutoring for their courses. Tutoring helps students learn course material for a specific class by clarifying course concepts and getting practice with course materials. Students do not have to be in jeopardy of failing to get help from a tutor. Click [here to watch the video directions](#) on how to schedule appointments through Starfish.

**Partner with An Academic Coach*:***
Academic coaching is a personalized student-coach partnership with appointments tailored to your individual needs. A coach can help you with organizational and study strategies. One-time appointments or a series of consultations throughout the semester are available. Click [here to watch the video directions](#) on how to schedule appointments through Starfish.

**Pear Deck Tutor*:***
Pear Deck Tutor is a private online tutoring company that CCRI has partnered with to supplement our CCRI Tutoring program. It is available 24/7 and students are allowed up to three hours per week at no charge! Students access Pear Deck Tutor through their CCRI Blackboard account.

**CCRI Library*:***
The CCRI Library provides a welcoming environment for individual and collaborative learning. Each campus has a library with access to print and online books, journals, and other resources.
Our catalog and databases can be accessed on campus or off campus. Librarians are available to assist students individually with research questions. We also work with faculty to provide specialized library instruction classes and offer [courses in information literacy and research skills](#).

**Public Safety:**
The CCRI College Police Department, also referred to as the Campus Police Department, is staffed with full-time, sworn police officers augmented with nonsworn public safety officers and dispatchers. We provide law enforcement services to all four CCRI campuses when the campuses are open and 24/7 services through our HQ's located at the Knight Campus in Warwick.

Our enforcement jurisdiction covers all four CCRI properties. The services we provide for the College community include responses to all emergencies; arrests for criminal violations; police reports; initial criminal investigations occurring on a campus or having a nexus to the College; referral services to outside law enforcement and social agencies; all Clery Act requirements; traffic enforcement, accident investigations and accident reporting on campus.

The College Police Department is also responsible for building and grounds security; College identification access control; lost and found; annual emergency exercises; educational training opportunities concerning public safety; and escorts per request. The CCRI College Police Department is an accredited law enforcement agency with the Rhode Island Police Accreditation Commission and maintains solid, working relationships with all other law enforcement agencies throughout the State of Rhode Island.

Contact us at 401-825-2109 for routine business and 401-825-2000 for on-campus emergencies. 911 is always acceptable for any emergency and will be forwarded to our dispatch center for a quick response.

**Civil Rights (Know Your Rights):**
**Pregnant and Parenting Students:**
CCRI is proud to welcome and support pregnant and parenting students on their path to success. If you need an accommodation, excused absence, or other resource or campus support to successfully complete your time at CCRI while pregnant or parenting, please contact the Title IX Coordinator via email at titleixcoordinator@ccri.edu or by phone at (401) 825-1126.

**Discrimination and Harassment:**
CCRI prohibits students and employees from engaging in discrimination and harassment based on any individual's race, color, creed, national or ethnic origin, gender, gender identity or expression, religion, disability, age, sexual orientation, genetic information, marital status, citizenship status, veteran status, and any other legally protected characteristic.
If you believe you have been subjected to discrimination or harassment, you can report such behavior to the Title IX Coordinator via email at titleixcoordinator@ccri.edu, by phone at (401) 825-1126

Nondiscrimination Policy and Complaint Procedures

**Sexual Harassment and Sexual Misconduct**
CCRI prohibits all forms of unlawful sexual harassment and sexual misconduct, which includes (but is not limited to) dating/domestic violence and stalking. If you believe you have been subjected to sexual harassment or sexual misconduct, you can report such behavior to the Title IX Coordinator via email at titleixcoordinator@ccri.edu or by phone at (401) 825-1126.

Title IX Sexual Harassment Policy and Procedures (S-17)
Nondiscrimination Policy and Complaint Procedures

## Exam Breakdown:

| Module | Chapter/Section/Topic Titles | % Coverage |
|---|---|---|
| 0.1.0 | Explain how single-area OSPF operates in both point-to-point and broadcast multiaccess networks. | 39% |
| 0.2.0 | Verify single-area OSPFv2 in both point-to-point and broadcast multiaccess networks. | 61% |
| Module Group Exam | OSPF Concepts and Configuration | 100% |
| 0.3.0 | Explain how vulnerabilities, threats, and exploits can be mitigated to enhance network security. | 28% |
| 0.4.0 | Explain how ACLs are used as part of a network security policy. | 24% |
| 0.5.0 | Implement standard IPv4 ACLs to filter traffic and secure administrative access. | 48% |
| Module Group Exam | Network Security | 100% |
| 0.6.0 | Configure NAT services on the edge router to provide IPv4 address scalability. | 46% |
| 0.7.0 | Explain how WAN access technologies can be used to satisfy business requirements. | 22% |
| 0.8.0 | Explain how VPNs secure site-to-site and remote access connectivity. | 34% |
| Module Group Exam | WAN Concepts | 100% |
| 0.9.0 | Explain how networking devices implement QoS. | 23% |
| 0.10.0 | Implement protocols to manage the network. | 26% |
| 0.11.0 | Explain the characteristics of scalable network architectures. | 25% |
| 0.12.0 | Troubleshoot enterprise networks. | 26% |
| Module Group Exam | Optimize, Monitor, and Troubleshoot Networks | 100% |
| 0.13.0 | Explain the purpose and characteristics of network virtualization. | 48% |
| 0.14.0 | Explain how network automation is enabled through RESTful APIs and configuration management tools. | 52% |
| Module Group Exam | Emerging Network Technologies | 100% |

## Final Exam Breakdown:

| Type | Module | Chapter/Section/Topic Titles | % Coverage |
|---|---|---|---|
| TLO | 0.1.0 | Explain how single-area OSPF operates in both point-to-point and broadcast multiaccess networks. | 9% |
| TLO | 0.2.0 | Verify single-area OSPFv2 in both point-to-point and broadcast multiaccess networks. | 9% |
| TLO | 0.3.0 | Explain how vulnerabilities, threats, and exploits can be mitigated to enhance network security. | 6% |
| TLO | 0.4.0 | Explain how ACLs are used as part of a network security policy. | 6% |
| TLO | 0.5.0 | Implement standard IPv4 ACLs to filter traffic and secure administrative access. | 9% |

| | | | | |
|---|---|---|---|---|
| TLO | 0.6.0 | Configure NAT services on the edge router to provide IPv4 address scalability. | | 9% |
| TLO | 0.7.0 | Explain how WAN access technologies can be used to satisfy business requirements. | | 6% |
| TLO | 0.8.0 | Explain how VPNs secure site-to-site and remote access connectivity. | | 8% |
| TLO | 0.9.0 | Explain how networking devices implement QoS. | | 5% |
| TLO | 0.10.0 | Implement protocols to manage the network. | | 7% |
| TLO | 0.11.0 | Explain the characteristics of scalable network architectures. | | 5% |
| TLO | 0.12.0 | Troubleshoot enterprise networks. | | 6% |
| TLO | 0.13.0 | Explain the purpose and characteristics of network virtualization. | | 8% |
| TLO | 0.14.0 | Explain how network automation is enabled through RESTful APIs and configuration management tools. | | 6% |

# Enterprise Networking, Security, and Automation (ENSA)

| Class | Lesson | Module Group Exam | Subjects | Labs/Videos/Projects |
|---|---|---|---|---|
| Sept 3 | 1& 2 | | **Module 1:** Single-Area OSPFv2 Concepts<br>**Module 2:** Single-Area OSPFv2 Configuration<br><br>**Labs to be Submitted via Netacad on or before Sept 12, 2024** | **Video 1.2.1** OSPF Packets<br>**Video 1.3.1** OSPF Operation<br>**Lab 2.2.13** (PT) Point-to-Point Single-Area OSPFv2 Configuration<br>**Lab 2.3.11** (PT) Determine the DR and BDR<br>**Lab 2.4.11** (PT) Modify Single-Area OSPFv2<br>**Lab 2.5.3** (PT) Propagate a Default Route in OSPFv2<br>**Lab 2.6.6** (PT) Verify Single-Area OSPFv2 Configuration |
| Sept 3 | | | **Due Sept 3, 2024 @ 9:50 PM** | **Lab 2.7.2** Single-Area OSPFv2 Configuration<br>**Lab 2.8.1** Implement Multi-Area OSPFv2 |
| Sept 12 | 3 | 1 (1-2) | **Module 3:** Network Security Concepts | **Video 3.3.1** Threat Actor Tools<br>**Video 3.5.2** Reconnaissance Attacks<br>**Video 3.5.4** Access and Social Engineering Attacks<br>**Video 3.6.1** Common IP and ICMP Attacks<br>**Video 3.6.4** Amplification, Reflection and Spoofing Attacks<br>**Video 3.8.3** ARP Spoofing<br>**Video 3.10.1** Cryptography |
| Sept 12 | | | **Due Sept 12, 2024 @ 9:50 PM** | **Lab 3.8.8** Explore DNS Traffic |
| Sept 19 | 4 & 5 | | **Module 4:** ACL Concepts<br>**Module 5:** ACLs for IPv4 Configuration<br><br>**Labs to be Submitted via Netacad on or before Sept 26, 2024** | **Lab 4.1.4** (PT) ALC Demonstration<br>**Lab 5.1.8** (PT) Configure Numbered Standard IPv4 ACLs<br>**Lab 5.1.9** (PT) Configure Named Standard IPv4 ACLs<br>**Lab 5.2.7** (PT) Configure and Modify Standard IPv4 ACLs<br>**Lab 5.4.12** (PT) Configure Extended IPv4 ACLs – Scenario 1<br>**Lab 5.4.13** (PT) Configure Extended IPv4 ACLs – Scenario 2 |
| Sept 19 | | | **Due Sept 19, 2024 @ 9:50 PM** | **Lab 5.5.2** Configure and Verify Extended IPv4 ACLs |
| Sept 26 | 6 | 2 (3-5) | **Module 6:** NAT for IPv4<br><br>**Labs to be Submitted via Netacad on or before Oct 7, 2024** | **Lab 6.2.7** (PT) Investigate NAT Operations<br>**Lab 6.4.5** (PT) Configure Static NAT<br>**Lab 6.5.6** (PT) Configure Dynamic NAT<br>**Lab 6.6.7** (PT) Configure PAT |
| Sept 26 | | | **Due Sept 26, 2024 @ 9:50 PM** | **Lab 6.8.2** Configure NAT for IPv4 |
| Oct 3 | 7 | | **Module 7:** WAN Concepts<br>**Labs to be Submitted via Netacad on or before October 10, 2024** | **Lab 7.6.1** (PT) WAN Concepts |
| Oct 10 | 8 | | **Module 8:** VPN and IPsec Concepts | **Video 8.3.1** IPsec Concepts<br>**Video 8.3.8** IPsec Transport and Tunnel Mode |
| Oct 10 | | | **Due Oct 10, 2024 @ 9:50 PM** | **Lab 8.3.1** Implement a GRE Tunnel<br>**Lab 8.3.2** Implement IPsec Site-to-Site VPN's |

| Class | Lesson | Module Group Exam | Subjects | Labs/Videos/Projects |
|---|---|---|---|---|
| Oct 17 | 9 & 10 | 3 (6-8) | **Module 9:** QoS Concepts<br>**Module 10:** Network Management<br><br>Labs to be Submitted via Netacad on or before October 24, 2024 | **Video 9.1.1** The Purpose of QoS<br>**Video 9.2.1** Traffic Characteristics<br>**Video 9.3.1** QoS Algorithms<br>**Video 9.4.1** QoS Models<br>**Video 9.5.1** QoS Implementation Techniques<br>**Video 10.7.1** Managing Cisco IOS Images<br>**Lab 10.1.5** (PT) Use CDP to Map a Network<br>**Lab 10.2.6** (PT) Use LLDP to Map a Network<br>**Lab 10.3.4** (PT) Configure and Verify NTP |
| Oct 24 | | | Due Oct 24, 2024 @ 9:50 PM | **Lab 10.6.11** Use Tera Term to manage Router Configuration Files<br>**Lab 10.6.12** Use TFTP, Flash, and USB to manage Configuration Files<br>**Lab 10.8.2** Configure CDP, LLDP, and NTP |
| Oct 31 | 11 | | **Module 11:** Network Design<br>**Module 12:** Network Troubleshooting<br><br>Labs to be Submitted via Netacad on or before Nov 7, 2024 | **Video 11.1.1** Three-Layer Network design<br>**Lab 11.5.1** (PT) Compare Layer 2 and Layer 3 Devices<br>**Lab 12.5.13** (PT) Troubleshoot Enterprise Networks<br>**Lab 12.6.1** (PT) Troubleshooting Challenge - Document the Network<br>**Lab 12.6.2** (PT) Troubleshooting Challenge - Use Documentation to Solve Issues |
| Nov 7 | 13 & 14 | 4 (9-12) | **Module 13:** Network Virtualization<br>**Module 14:** Network Automation | **Video 13.1.1** Cloud and Virtualization<br>**Video 13.4.1** Software-Defined Networking<br>**Video 13.5.2** Cisco ACI<br>**Video 14.1.1** Automation Everywhere<br>**Video 14.2.1** Data Formats<br>**Video 14.3.1** APIs<br>**Video 14.4.1** REST<br>**Video 14.5.1** Configuration Management Tools<br>**Video 14.6.1** Intent Based Networking<br>**Video 14.6.6** DNA Center Overview and Platform APIs<br>**Video 14.6.7** DNA Center Design and Provision<br>**Video 14.6.8** A Center Policy and Assurance<br>**Video 14.6.9** DNA Center Troubleshooting User Connectivity |
| Nov 14 | Work on Case Study | | | |
| Nov 21 | Work on Case Study | | | |
| Dec 5 | | 5 (13-14) | Review | Case Study |
| Dec 5 | Hands-on Practical Exam / Final Exam / Notebook | | | |
| Dec 12 | Hands-on Practical Exam / Final Exam / Notebook | | | |
| Dec 19 | Hands-on Practical Exam / Final Exam / Notebook | | | |

# This Syllabus is subject to change!