Introduction to Networking 🌐

COMP 1080 | Spring 2026

Course Information

Instructors:

- Brendan Shea, Ph.D. (Brendan.Shea@rctc.edu)
- Derek Dolan (Derek.Dolan@rctc.edu)

Office: M2403Q
Office Hours: 10 - 12 M/W (Brendan) by Zoom

Class Format: Online (Asynchronous)
Class Zoom Link: TBA

Prerequisites:

- COMP 1150
- MATH 0099

Course Description 🕮

This class examines the basic principles of networking, transitioning from protocols (TCP, UDP, ICMP, and IP), network architecture, and the OSI model into network defense. Networks are the lifeblood of an organization as packets transition from one device to another through internal and external communications. Cybersecurity professionals must have a strong understanding of network processes, protocols, and administration. This course will focus on developing skills in creating network architecture, network administration, network analysis, and how to apply this knowledge to improve the network security posture through defense in depth. (4 credits)

Course Content and Learning Outcomes 🎯

Major Content Areas

1. Introduction to Networking Fundamentals a. Basic Networking Concepts b. Network Services and Connections
2. Network Topologies and Cloud Technologies a. Types of Network Topologies b. Introduction to Cloud Networking
3. Routing Technologies and Devices a. Ethernet, LAN, and WAN b. SDN, NAT, and Wireless Networking
4. Network Protocols: TCP, UDP, ICMP, and IP a. OSI Model Overview b. Protocol Classification and Roles
5. Identifying Threats to Networks a. System Protection Strategies b. Introduction to Cryptography
6. Wireless Security a. Wireless Protocols and Risks b. Secure Wireless Configuration

7. Monitoring and Optimization a. Network Monitoring Tools b. Optimization for Business Continuity
8. Disaster Planning in Network Security a. Disaster Planning Strategies b. Risk Analysis in Networking
9. Policy Development and Physical Security a. Policy Guidelines and Implementation b. Role of Physical Security
10. The Economics and Ethics of Network Security a. Cost-Benefit Analysis b. Legal and Ethical Considerations
11. Common Network Troubleshooting Techniques a. Connectivity Issues b. Software Challenges
12. Network Hardening Practices a. Best Practices for Secure Configuration b. Security Impact Assessment

Learning Outcomes (General)

The student will be able to:

1. Design network architecture focusing on security and performance.
2. Classify networking devices and their impacts to network security at an organizational level.
3. Distinguish between the seven layers of the OSI model and what protocols are involved at the various levels.
4. Interpret network packets and identify signs of threats to the organization.
5. Identify network threats through protocol and device analysis and the impacts on the security of the enterprise.
6. Define and implement network hardening practices.
7. Discern the differences between and analyze TCP, UDP, IP, ICMP, and other networking protocols.

Learning Outcomes (MNTC)

None

RCTC Core Outcomes

This course contributes to meeting the following RCTC Core Outcome(s):

Critical Thinking: Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

Required and Recommended Course Materials

- All course materials will be made available free online through D2L.
- This course will require that you have reliable, regular internet access. Most assignments will require you use a PC, Mac, or Linux desktop or laptop (Android, iOS, or Chrome OS may have problems with lockdown browser or Colab).

Grading and Course Policies

Grading Scale

- **A:** 90.0 and above

- **B:** 80.0-89.9
- **C:** 70.0-79.9
- **D:** 60.0-69.9
- **F:** Below 60.0

Grade Breakdown

Your final grade is a weighted average of the following:

CompTIA CertMaster Labs - 25%

These labs will give you practice in creating, modifying, monitoring, and securing networks.

Annotated Readings and Quizzes on Perusall - 25%

This will provide you with the opportunity to reflect on key ideas, events, and issues in computer science. They will be delivered in *Perusall* (see below).

Network+ Practice Exam - 25% total (5 exams × 5% each)

This practice exam will provide questions to prepare you for the real exam. You can take it up to three times.

Network+ Exam - 25% total

Once you have completed three practice exams with a grade of over 70%, RCTC will provide you with a free voucher to take this professional certification exam. Grading is as follows:

- 12.5% (half credit) for attempting the exam
- 25% (full credit) for passing the exam and earning the certification

Extre Credit (up to +3%). There may be occasional opportunities for extra credit. These will be announced over D2L.

Attendance

Students in face-to-face classes should attend class regularly, while online students are expected to participate in class discussions and activities. **If you miss more than one week consecutively or 1/4 of the total class sessions, you may receive a failing grade of FW.** This may endanger your ability to receive financial aid. With this in mind, you are responsible for withdrawing from the class if you decide not to continue. I am willing to make exceptions if circumstances require, but you must let me know about these promptly.

Plagiarism and Academic Integrity

Your work should be your own---please don't use your classmates, friends, parents, internet sites, etc., to help you write your papers or answer test questions. And when you do use outside sources, make sure to give appropriate citation and acknowledgment for any words, ideas, or arguments. If the preponderance of the evidence suggests cheating has occurred (that is, if the evidence indicates that this is *more likely than not*), you will receive a failing grade on the assignment. A second violation will lead to a failing grade for the course. Please also see the RCTC statement on academic integrity later in the syllabus.

Policy on Generative AI

I encourage you to use generative AI (ChatGPT, Gemini, Bing, Claude, etc.) to help you understand class content when needed (and mastering these tools will be important to almost any career path), and to work on your own projects (I've used it in my own projects, including for this course!). However, the use of generative AI is **ABSOLUTELY FORBIDDEN** when it comes to answering questions on quizzes or exams.

Policy on Late Work ⏰

Please read the following *before* emailing me to request an extension on an assignment.

If you miss a quiz or activity due to a brief sickness, work conflict, class trip, computer malfunction, wedding, auto problem, court date, funeral, sporting event, etc., you do NOT need to email me (though it's okay if you want to give me a heads up). Here are my policies for making up missed or late work:

Perusall reading assignments can be submitted up to two days late for reduced credit. Credit declines "linearly" (basically, if you submit it one minute late, you get 99.9% of the credit; if you submit it 1.5 days late, you'll get almost no credit).

I will make exceptions to these policies if you can demonstrate a genuine need. Please talk to me if anything comes up that is preventing you from succeeding in class.

Using Perusall 📝

Perusall is a digital platform that we're using to enhance your learning. It allows you to collaboratively annotate readings and engage with your classmates and me. The goal is to make reading more interactive and to deepen your understanding of the material.

You'll access Perusall through links provided in our D2L-Brightspace course. Once you click on these links, you'll be directed to the readings assigned for our class.

For each reading, you'll need to post annotations. These can be questions, comments, replies to comments of others, or reflections. Make sure to read others' annotations, too, and respond when you can. This is part of your active participation.

RCTC Common Policies ⚖️

This course will be taught in accordance with the following policies, which apply to ALL RCTC courses. If you have any questions about these, please let me know!

Academic Integrity Statement

The primary academic mission of Rochester Community and Technical College (RCTC) is to provide quality learning opportunities for students. Acts of academic dishonesty undermine the educational process and the learning experience for the student and our college community. It is the responsibility of the student to complete their academic requirements with integrity and not engage in acts of cheating, plagiarism, or collusion. The College expects that students are submitting work and materials that reflects their individual learning and efforts within their course, program, and college academic requirements.

It is expected that RCTC students will understand and adhere to the concept of academic integrity and to the standards of conduct outlined within this policy. Students who are found to have engaged in an act of

academic dishonesty may face academic sanctions through the Academic Integrity Procedure and non-academic misconduct sanctions through the Code of Student Conduct.

Americans with Disabilities Act

Rochester Community and Technical College is committed to ensuring its programs, services and activities are accessible to individuals with disabilities, through its compliance with state and federal laws, and System Policy. Appropriate accommodations are provided to those qualified students with disabilities. If you believe you qualify for an academic accommodation, please contact the Director of Disability Support Services, Travis Kromminga at 507-280-2968 or through the Minnesota relay TTY 1-800-627-3529. The office can also be reached via e-mail at travis.kromminga@rctc.edu.

Military Friendly Statement

Rochester Community and Technical College (RCTC) is a military friendly campus, pledging to do all we can to help military veterans transition into college to complete their educational goals. RCTC is proud to serve and honor our veterans and military service members and their families. Through the Veterans Resource Center, RCTC offers student veterans an on-campus point of contact with other veterans, and program information to assist them in making a successful transition into college. For assistance, students are encouraged to contact the Veterans Assistant Coordinator, Mark Larsen, at 507-779-9375 or e-mail at mark.larsen@state.mn.us, or Othelmo da Silva, RCTC's VA certifying official at 507-285-7566 or email at VeteranServices@rctc.edu.

Title IX Statement

Title IX of the Education Amendments of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." Today, Title IX ensures that sex-based discrimination, including that related to pregnancy/parenting, sexual orientation, and gender identity, is responded to promptly and effectively with a fair, transparent, and reliable process.

Anyone who believes there has been an act of discrimination, harassment, or violence on the basis of sex against any person or group in a college-sponsored program or activity may file a complaint through the reporting form to the Title IX Coordinator, Dr. Teresa Brown. The coordinator may also be reached via email at titleix@rctc.edu or phone at 507-285-7217.

Pregnant and parenting students may reach out to the Title IX Coordinator to learn of their rights and available support. They may use the contact information above or submit a request via this form.

Resources for Student Success 🎓

Some helpful resources at RCTC (all of which are included with your course tuition) include the following:

Student Support Services/TRIO (SS 159) provides academic support for first-generation and low-income college students, as well as those with documented disabilities.

Drop-in Math/CS Tutoring (GL 235) is available free of charge to *all* RCTC students. Please take advantage of it!

Course Calendar 🗓

The following calendar indicates the due dates for each assignment. In general, all labs for the week are due on **MONDAY** of the next week.

Week	Dates	Topic (for both lecture and labs)	Other
1	1/11	Syllabus	
2	1/18	Explaining Network Topologies	
3	1/25	Supporting Cabling and Physical Installations	
4	2/1	Configuring Interfaces and Switches	
5	2/8	Configuring Network Addressing	
6	2/15	Configuring Routing and Advanced Switching	
7	2/22	Implementing Network Services	
8	3/1	Explaining Application Services	
9	3/8	SPRING BREAK	Practice Exam 1
10	3/15	Supporting Network Management	
11	3/22	Explaining Network Security	Practice Exam 2
12	3/29	Applying Network Security	
13	4/5	Supporting Network Security	Practice Exam 3
14	4/12	Configuring Wireless Networks	
15	4/19	Comparing Remote Access Methods	Practice Exam 4
16	4/26	Summarizing Cloud Concepts	
17	5/3	Take Network+ Exam	Practice Exam 5
18	5/10	Take Network+ Exam	