

**Spring 2020**  
**CIS 309: IT Hardware and Networking Lab**  
**Department of Computing Sciences**  
**The College at Brockport**  
**State University of New York**

**Instructor Contact Information:**

- Instructor: John Perevich, MPA
  - Office: DP04 Tuttle North Data Center (Ground floor between Ice Rink and Pool)
  - Phone: (585) 395-2888
  - Fax #: (585) 395-2304
  - Email: jperevic@brockport.edu
  - Class Hours:
    - W 6:30 PM – 9:10 PM, Smith 111
  - Office Hours:
    - Thursday 11:30 AM – 12:20 PM @ Tuttle North DP04 - Ring door bell.
    - Or by appointment
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**Textbook**

- None

**Supplemental Materials:**

- Provided by instructor

**Course Description**

This laboratory course will introduce computer/server hardware technology, operating systems, network hardware and networking management software via hands on lab environments. The student will learn how components work together in computer/server and network systems, how to take measurements, master industry-standard operating systems, and learn basic system and network troubleshooting. The student will gain experience solving real hardware, networking and software issues. **1 credit.**

**Prerequisite**

- CSC 303: Computer Systems Hardware and Software

**Course Objectives**

- Study of basic principles in data communications, local networking
- Study of network applications (Monitoring, Management)
- Study of Ethernet and wireless networks (focus on OSI Layers 1,2,3)
- Study of communication protocol TCP/IP, network switch programming, and network security
- Study of basic Windows Server concepts.

## Nature of the Course

This course provides an introduction to physical IT Infrastructure, data communication, local networks, Windows Server and network applications. It is meant to be a preparation as a computer network analyst and beyond as a computer network technician. With some additional preparation and coursework, students will be able to seek CompTIA Network+ certification.

## Hardware and Software Environment

We will do some hands-on work with Cisco network switches and Microsoft Windows 2019 Servers. **Wireshark, Cisco Packet Tracer and NMAP** are free and open-source network tools that we may use at various points in the labs. We will also use a SNMP monitoring tool such as **LibreNMS** or **PRTG** to monitor our network devices and servers.

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## Course Learning Outcomes

- Understand goals of networking, reference models, and role of standards
- Understand business requirements for communication and explore network technology as an enabler of organizational performance
- Understand characteristics of various communication media, physical and data link layer issues, error detecting/correcting codes and related tradeoffs
- Understand IEEE 802.03 (Ethernet) and IEEE 802.11 (wireless) protocols
- Understand Internet addressing, IPv4, subnets, and TCP/IP protocol characteristics
- Understand network hardware such as hubs, switches, routers (both wired and wireless), NAT devices, and DHCP servers
- Learn to configure LAN and TCP/IP networks; explore network-troubleshooting commands such as ping, traceroute, nslookup, netstat, etc.
- Understand network security issues

## Student Outcomes (ABET)

### *CSC-AC Track:*

**A.** Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

**A5.** Demonstrate an understanding operating system fundamentals to help identify hardware and software resources needed to carry out the solution

**F.** Apply computer science theory and software development fundamentals to produce computing-based solutions.

**F4.** Demonstrate an ability to apply an understanding of number systems, data encoding, and graph theoretic algorithms to solve problems related to computer networks and security

Only **F4** data is collected in this course for the assessment of overall CSC-AC student outcomes.

### *CIS Track:*

**A.** Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

**A5.** Demonstrate an ability to analyze information technology infrastructure issues and identify communication and networking resources needed to support a solution for a computing problem

**B.** Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

**B1.** Demonstrate competency in recognizing security vulnerabilities in information systems and evaluating ways to secure vulnerable systems

**B2.** Demonstrate competency in configuring and troubleshooting LAN and TCP/IP networks

**A5** and **B2** data are collected in this course for the assessment of overall CIS student outcomes.

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### **Workload**

- 12 in class lab exercises (**60%**)
- 3 In-class Quizzes, 20 minutes each, (**15%**)
- Final Examination, 60 minutes, (**15%**)
- Class attendance and participation. (**10%**)

### **Grading Policy**

	<b>A</b> is $\geq 90\%$	<b>A-</b> is $\geq 87\%$ but $< 90\%$
<b>B+</b> is $\geq 83\%$ but $< 87\%$	<b>B</b> is $\geq 80\%$ but $< 83\%$	<b>B-</b> is $\geq 77\%$ but $< 80\%$
<b>C+</b> is $\geq 73\%$ but $< 77\%$	<b>C</b> is $\geq 70\%$ but $< 73\%$	<b>C-</b> is $\geq 67\%$ but $< 70\%$
<b>D+</b> is $\geq 63\%$ but $< 67\%$	<b>D</b> is $\geq 60\%$ but $< 63\%$	<b>D-</b> is $\geq 57\%$ but $< 60\%$
	<b>E</b> is $< 57\%$	

### **Passing Grade**

The passing grade in this course is **C** (required for CSC-AC and CIS).

The passing grade in this course is **D-** (elective for CSC-SD and other majors).

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## Schedule and Timeline (Tentative)

	Weeks	Chapter / Topics	Assignments / Deliverables
Network Fundamentals	Jan 29	Introductions; networks basics, Lab overview / design.	
	Feb 5	OSI Layer 1 - Cable Lab	Lab 1
	Feb 12	Basic Cisco Switch config – Console, Management IP / SSH	Lab 2A
	Feb 19	Network/Server Rack install, Power, UPS and Switches “racked and stacked” and connected to the network.	Lab 2B
Local Networks and Switching and Monitoring Tools	Feb 26	Cisco Switch config – NTP, SNMP SNMP Network Monitoring Applications	Lab 3
	Mar 4	Cisco Switch config – VLANs SNMP Network Monitoring Applications	Lab 4
	Mar 11	<b>First in-class Quiz- 20 minutes: Wednesday Mar 11</b> Cisco Switch Configuration Topics SNMP Network Monitoring Applications	Lab 5
	Mar 18	Spring Break	
	Mar 25	Cisco Wireless Network – AP configuration	Lab 6
Server Hardware & Operating System	Apr 1	<b>Second in-class Quiz- 20 minutes: Wednesday April 1</b> Server - Power Supply, Memory and CMOS Setup	Lab 7
	Apr 8	Server - Hardware and OS Installation	Lab 8
	Apr 15	Server – External Interfaces, Secondary storage	Lab 9
Advanced Topics	Apr 22	Server – Windows 2019 Configuration Topics	Lab 10
	Apr 29	<b>Third in-class Quiz- 20 minutes: Wednesday April 29</b> Server – Windows 2019 DHCP Services	Lab 11
	May 6	Advanced tools – NMAP	Lab 12
	May 13	<b>Comprehensive Exam Wednesday, May 13 at classroom</b> <b>*This Exam is Timed*</b>	

## **Policy on Assignments and Academic Integrity**

**Academic Integrity:** Students are required to observe all college regulations concerning academic integrity. It is important for students to understand that the College faculty and staff value student honesty and integrity. Academic dishonesty, "cheating" and other forms of misrepresenting others' work as your own, such as plagiarism, are considered serious breaches of academic integrity and are major violations of the standards of ethical behavior that the College expects from all its students. When detected, as it often is, academic dishonesty can result in a range of disciplinary actions including failure on an assignment, failure of a course, or even Conduct Dismissal from the College. Records of disciplinary actions for dishonesty are kept and conduct dismissals are noted on College transcripts. The best rule is to assume that instructors expect all work (exams, papers, projects, etc.) submitted for grading to be entirely your own, done without collaboration. If the instructor allows or desires collaboration, you should assume that the instructor will make that clear in the assignment. If the instructor has not explicitly stated that collaboration is permitted, all work submitted should be entirely your own.

**Definitions of Academic Dishonesty Covered by this Policy:** Violations of the Student Academic Dishonesty Policy refer to actions related to the standards of honesty required in submission and evaluation of coursework in any undergraduate or graduate course bearing The College at Brockport credit. These violations include, but are not limited to the following:

A. Plagiarism — presenting as one's own, the exact words of another, not properly indicated by quotation marks, paraphrased text too similar to the original, ideas, or creative products of another without providing an adequate standard form of documentation to identify the source — such as footnotes, endnotes, or bibliographic documentation. Students are advised to scrupulously acknowledge and properly cite all sources to give appropriate credit for borrowed materials.

B. Fabricating facts, data, statistics, or other forms of evidence included in papers, laboratory experiments, theses, or other assignments.

C. Presenting someone else's examination results, paper, computer work, or other material as one's own work. This includes work done as part of group/team effort unless collaboration has been specifically approved by the instructor for any particular assignment. Students should always assume that any out-of-class assignments or take home examinations are to be done individually and without help or collaboration unless the instructor specifically states otherwise. Students should not generalize from one assignment to another as instructors may permit collaboration on some assignments but not on others.

D. Representing one's own performance as another's or knowingly allowing such misrepresentation to occur, e.g., signing another student into class; taking an exam for another student; writing or attempting to write an examination, paper, computer work, or other material for another student.

E. Buying and selling, or sharing of examinations or assignments; being in possession of examinations or answers to examinations without the instructor's permission.

F. Using "cheat sheets," looking onto another's paper, talking to someone other than the instructor or proctor during an examination, or using any other method of communication (e.g. cell phones, text messaging) during an examination without the instructor's permission.

G. Failing to follow the rules of conduct for taking an examination as stipulated by the instructor prior to the examination or as stated in a written course syllabus.

H. Presenting work for a current course (e.g. papers, projects, research) that is substantially the same as a previous submission for another course without obtaining the current instructor's prior consent to do so. When the courses are taught in the same semester, informing and obtaining prior approval of both course instructors is required to avoid a possible dishonesty charge.

The following Web site has additional information about this policy.

[https://www.brockport.edu/support/policies/adopted/aa\\_vprovost\\_academicaffairs\\_academic\\_dishonesty.html](https://www.brockport.edu/support/policies/adopted/aa_vprovost_academicaffairs_academic_dishonesty.html)

**Late Assignments:** All assignments are to be completed on individual basis, i.e., on your own. Late assignments will be accepted within 4 days beyond the deadline with a penalty of 10-15% per day (including weekends and other holidays). If you have problems meeting the deadlines, you are encouraged to consult me prior to the due date. Being absent from class for one reason or another is not an excuse for submitting assignments late. When acts of academic dishonesties occur, college policies and procedures will be followed, often leading to severe penalties.

### **Policy on Attendance and Conduct in Classroom**

The student is responsible for all assigned course work and cannot be absolved of this responsibility. When enrolled in a particular course, the student is obligated to do all of the work assigned. Punctual and regular attendance is vital to the discharge of this obligation. Absences, excused or not, do not alter this responsibility.

The following Web site has additional information about this policy.

[https://www.brockport.edu/support/policies/adopted/aa\\_vprovost\\_academicaffairs\\_attendance\\_guidelines.html](https://www.brockport.edu/support/policies/adopted/aa_vprovost_academicaffairs_attendance_guidelines.html)

Faculty Senate legislation mandates student attendance in all classes. Students who are unable to attend the examinations or meet deadlines for assignments on particular days due to religious beliefs, must contact me ahead and work out alternate arrangements. Students are expected to behave as reasonable adults, motivated to explore the subject matter with proper guidance from the instructor. Late arrivals and early departures disturb the entire class and should be avoided. As per Senate policy, students whose unexcused absences exceed 15 percent of the scheduled classes and laboratories (8 classes/labs) may receive a lowered grade or failure at the instructor's discretion.

### **Disability Statement**

Students with documented disabilities may be entitled to specific accommodations. The College at Brockport's Office for Student with Disabilities makes this determination. Please contact the Office for Students with Disabilities at (585) 395-5409 or [osdoffic@brockport.edu](mailto:osdoffic@brockport.edu) to inquire about obtaining an official letter to the course instructor detailing any approved accommodations. The student is responsible for providing the course instructor with an official letter. Faculty work as a team with the Office for Students with Disabilities to meet the needs of students with disabilities.

### **Title IX Compliance**

Sex and Gender discrimination, including sexual harassment, are prohibited in educational programs and activities, including classes. Title IX legislation and College policy require the College to provide sex and gender equity in all areas of campus life. If you or someone you know has experienced sex or gender discrimination, sexual harassment, sexual assault, intimate partner violence, or stalking, we encourage you to seek assistance and to report the incident through resources available at [https://brockport.edu/about/title\\_ix/](https://brockport.edu/about/title_ix/). Confidential assistance is available on campus at Hazen Center for Integrated Care and RESTORE. Faculty are NOT confidential under Title IX and will need to share information with the Title IX & College Compliance Officer. For these and other policies governing campus life, please see <https://www.brockport.edu/support/policies/student.php>.

### **Emergency Alert Statement**

In case of emergency, the Emergency Alert System at The College at Brockport will be activated. By signing up for RAVE, you can receive warnings and emergency information via the web, your cell phone, email and other technologies. Students can sign-up for RAVE using the link on the College's Emergency Information website. Included on the website are detailed information about the College's Emergency Action Plan, Classroom Emergency Preparedness, Official Evacuation Procedures, Emergency Communication, and Contacts (phone numbers, email addresses, etc.). In addition, students are encouraged to familiarize themselves with the Emergency Procedures posted in classrooms, halls, and buildings and all college facilities.

<https://www.brockport.edu/support/emergency>.

### **Weather Conditions and Class Cancellations**

I have no authority to cancel classes, no matter what the weather condition is. Only the President of the College makes that decision. On days of severe weather conditions, please listen to WBSU (89.9 FM) and WHAM (1180 AM) for class cancellations. You may also call (585) 395-COLD at the College. If I have any information, I will try my best to send email, leave voice mail, or post messages.

### **Statement of Non-discrimination**

The College is committed to fostering a diverse community of outstanding faculty, staff, and students, as well as ensuring equal educational opportunity, employment, and access to services, programs, and activities, without regard to an individual's race, color, national origin, religion, creed, age, disability, sex, gender identity, sexual orientation, familial status, pregnancy,

predisposing genetic characteristics, military status, domestic violence victim status, or criminal conviction. Employees, students, applicants or other members of the college community (including but not limited to vendors, visitors, and guests) may not be subjected to harassment that is prohibited by law, or treated adversely or retaliated against based upon a protected characteristic.

### **Statement of Equity and Open Communication**

I recognize that each class I teach is composed of diverse populations and am aware of and attentive to inequities of experience based on social identities including but not limited to race, class, assigned gender, gender identity, sexuality, geographical background, language background, religion, disability, age, and nationality. This classroom operates on a model of equity and partnership, in which we expect and appreciate diverse perspectives and ideas. If anyone is experiencing exclusion, intentional or unintentional aggression, silencing, or any other form of oppression, I encourage open communication with myself and/or the class as a whole.

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### **Help**

- See me during office hours. There is no need for appointments. But, if you want to meet with me outside of office hours, please call or email and make an appointment.
- Call me at (585) 395-2888. If I cannot be reached, leave a voice mail.
- For class communication, I will send email via Blackboard. Send your email to me via the address [jperevic@brockport.edu](mailto:jperevic@brockport.edu) if you have any questions or issues.
- Blackboard® is used for posting class notes and messages.

### **Laboratory Work**

- Laboratory work will be in Smith 111 computer laboratory.
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