

Data Communications

IST-220

Fall 2022 Section 412 3 Credits 08/22/2022 to 12/12/2022 Modified 09/08/2022

Meeting Times

Class meeting times are subject to change. Contact your instructor with questions or concerns.

Internet Course: Bldg: ONL Room: ONL 08/22/2022 - 12/12/2022

Lecture: Bldg: 103 Room: 238 Mon 08/22/2022 09:35AM - 12/05/2022 11:35AM

Exam: Bldg: 103 Room: 238 Mon 12/12/2022 08:00AM - 12/12/2022 10:30AM

Contact Information

Dean: Michelle Byrd

Email: michelle.byrd@gvltec.edu

Office: Barton ET103-111A

Phone: 864.250.8189

Department Chair: Phillip C. Cluley

Email: clulepcc@my.gvltec.edu

Office: Barton ET103-217

Phone: 864.250.8655

Website: https://www.gvltec.edu/academics_learning/business-computer/computer_technology/index.html
(https://www.gvltec.edu/academics_learning/business-computer/computer_technology/index.html)

Professor Mark Johnson

Email: mark.johnson@gvltec.edu

Office: ET-218

Phone: (864) 250-8138

Office Hours

Listed in Course Site in Syllabus and Info Section

Description

3-0-3 Offered Fall, Spring, and Summer Semesters Prerequisite: Placement into ENG 101 and placement into MAT 101 or higher This course is a study of the fundamentals of data communications. Basic signaling, networking and various transmission media are covered.

Requisites

Prerequisite: Placement into ENG 101 and placement into MAT 105 or higher

Cengage Unlimited Subscription

Publisher: Cengage Learning

Cengage Unlimited Subscription Options:

1. Cengage Unlimited Subscription: (12 Months)*
 - ISBN: 978-0-357-70004-4
2. Cengage Unlimited Subscription: (4 months)
 - ISBN: 978-0-357-70003-7

** Recommended if using Cengage Learning digital content for multiple courses*

Optional-Text: Network+ Guide to Networks, 8th Edition

Author: Jill West, Jean Andrews, Tamara Dean

Publisher: Cengage Learning

Edition: 8th Edition

ISBN: 9781337569330

Optional

Additional Materials, Supplies, Equipment, and Technology (i.e. Webcams):

Webcam

Blackboard portal website via gvltec.edu:

Students in traditional classes must access Blackboard for course-related information.

Students in blended classes will access their online content through Blackboard

Course Objectives

Course Outcomes:

Students who successfully complete this course will have demonstrated the skills required to accomplish the following objectives with a minimum competence level of 70 percent.

1. 1. Explain the functions of the layers of the OSI reference model and the core TCP/IP protocols.
2. Explain the basic components and concepts of networking.
3. Explain the IPv4 and IPv6 addressing scheme.
4. Explain how communication occurs across a network.
5. Identify and explain common network problem

The outcomes of this course are intended to meet the Computer Technology program level student learning outcomes.

Program Learning Outcomes

Program Student Learning Outcomes:

Upon successful completion of the Computer Technology Degree students will be able to:

1. Install and configure an array of computing devices and software.

2. Analyze and describe technological needs using appropriate industry terminology.
3. Build, maintain, and troubleshoot secure applications, systems, or networks using modern resources and tools.
4. Utilize effective customer support and problem resolution skills.
5. Apply techniques and skills learned, appropriate to the discipline, to develop systems solutions.
6. Identify the local and global impacts of computing on individuals, organizations, and society.

Core Competencies

Assessment of Student Learning: Greenville Technical College is committed to continuous improvement of teaching and learning. Tests, assignments, presentations, and/or projects required in this course may be shared with college faculty and used for assessment purposes.

Program assess learning outcomes specific to their program and college-wide outcomes referred to as core competencies.

Core competencies are a set of skills, knowledge, and behaviors identified as critical to the success of students graduating from degree and diploma programs at GTC. Each year, the College collects data on student learning of the core competencies and uses data to make improvements in our programs.

There are four (4) core competencies that are assessed.

Written Communication

Students will demonstrate effective written communication skills to convey information, ideas, or opinions.

Oral Communication

Students will demonstrate effective oral communication skills to convey information, ideas, or opinions.

Critical Thinking

Students will demonstrate effective reasoning, problem solving, or quantitative skills to develop an opinion or conclusion.

Critical thinking includes one or more of the following:

- **Critical Reasoning:** Students will employ inquiry, analysis, and synthesis of information to formulate and/or evaluate an opinion or conclusion.
- **Problem Solving:** Students will design and formulate a strategy to answer a question or achieve a desired goal.
- **Quantitative Reasoning:** Students will analyze numerical information or observable facts resulting in informed conclusions.
- **Creative Thinking:** Student will demonstrate the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking.

Information Literacy

Students will locate, evaluate, and use information effectively from diverse sources.

Grading Scale

Computer Technology students must obtain a minimum grade of “C” in all CPT and IST courses. Please refer to Departmental Policies in Blackboard to review additional course and department policies.

Breakdown

10 Point Letter Grade (rounding up)

Final letter grades will be issued as follows:

Grade	Range	Notes
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Grade	Range	Notes
A	90 to 100+	
B	80 to 89	
C	70 to 79	
D	60 to 69	<i>Computer Technology students must obtain a minimum grade of "C" in all CPT and IST courses.</i>
F	0 to 59	<i>Computer Technology students must obtain a minimum grade of "C" in all CPT and IST courses.</i>

Criteria

Type	Weight	Topic	Notes
Assignments	40%		<i>*Assignments may include quizzes, labs, discussion board forums, traditional assignments, online assignments, chapter reviews, online forums, weekly projects, and journals</i>
Proctored Midterm Examination	20%		
Proctored Skills Exam	20%		
Proctored Final Examination	20%		

* Course Policies

Polices and Procedures

- Computer Technology students must obtain a minimum grade of "C" in all CPT and IST courses in order to earn credit towards a degree or certificate
- Classrooms assigned to the Computer Technology Department must be locked at all times except during scheduled
- Students may work in CPT classrooms outside of normal class schedule hours if given approval by department
- Under no circumstances should CPT classrooms be open when no one is working in the classroom; the last person leaving the classroom must close the door(s) which should automatically lock

Department Exam Policy

- Exam Policies reference Final Exams, Midterm Exams, and/or Skills Exams
- Exams must be taken as scheduled with no exemptions or exceptions
- A Comprehensive Final Exam will be given, unless otherwise stated the course syllabus
- Midterm and/or Skills Exams may be given and will be stated specifically on the course syllabus
- Exam dates will be announced in class and posted on Blackboard
- The student assumes responsibility for materials and announcements missed when absent
- Exams must be taken on or before the announced day; early exams may be arranged at the instructor's discretion; Late Exams will not be permitted

Exceptions to the Departmental Exam Policy will be made on an individual basis as a result of a decision involving the department head, instructor, student, and/or the Divisional Dean

Department Test Policy

- Test Policies reference Unit Tests, Chapters Tests, and/or Projects
- Three or more unit tests will be given, unless otherwise stated in the course syllabus
- Test dates will be announced in class and posted on Blackboard
- The student assumes responsibility for materials and announcements missed when absent

- Tests must be taken on or before the announced day; early tests may be arranged at the instructor's discretion
- Each student will be allowed one make-up test in a course (for a penalty of no more than 20%)
- Additional missed tests will result in a grade of zero for that specific
- The date and time of the make-up test will be at instructor's discretion, not to exceed seven days after the scheduled test date
- Curves and bonus options will not be allowed for any make-up test

Exceptions to the Departmental Test Policy will be made on an individual basis as a result of a decision involving the department head, instructor, student, and/or the Divisional Dean

Department Assignment Policy

- Assignment Policies reference Assignments, Quizzes, and/or Journals
- Assignment dates will be announced in class and posted on Blackboard
- The student assumes responsibility for materials and announcements missed when absent
- Late assignment will not be accepted
- Assignments makeups will not be permitted, unless otherwise stated in the course syllabus

Exceptions to the Departmental Assignment Policy will be made on an individual basis as a result of a decision involving the department head, instructor, student, and/or the Divisional Dean

Department Lab Policy

- Lab Policies reference hands-on labs, equipment labs, virtual labs, and/or group Labs
- The student assumes responsibility for materials and announcements missed when absent
- Late labs will not be accepted
- Lab makeups will not be permitted, unless otherwise stated in the course syllabus
- The date and time of the make-up labs will be at instructor's discretion

Exceptions to the Departmental Lab Policy will be made on an individual basis as a result of a decision involving the department head, instructor, student, and/or the Divisional Dean

Departmental Academic Honesty Policy for Cheating and Plagiarism

Cheating and Plagiarism will not be tolerated in any Computer Technology course. If cheating and/or plagiarism are found, the following grading penalty will be assessed:

- First Offense – A grade of zero (0) will be assessed for the assignment or test on which the offense
- Second Offense – At a minimum, the student will receive a grade of zero (0) for that portion of the course in which the additional offense

Incompletes:

An INCOMPLETE ("I") will only be approved if ALL of the following conditions exist:

- The student must have no more than 4 weeks (14-week term) or 2 weeks (7-week/10-week term) remaining to complete the
- The student must have a validated, documented reason why he/she cannot complete the course by the prescribed end date (illness, work situation, death,).
- The student must be up to date with all work up to the point of the request for an Incomplete (no untaken tests or un-submitted labs, homework, etc.), and the student must have a passing grade average (C or higher) for all work

Plan of Instruction

Course Schedule (Plan of Instruction)

Please refer to Syllabus Addendum in Blackboard to review the Tentative Course Schedule. Your instructor will provide a detailed, week-by-week plan of instruction along with method of delivery, testing, and assignment submission.

Course Outline:

Course Outline (Modules)

1. Introduction to Networking
2. How Computers Find Each Other on Networks
3. How Data Is Transported Over Networks
4. Structured Cabling and Networking Elements
5. Network Cabling
6. Wireless Networking
7. Cloud Computing and Remote Access
8. Network Risk Management
9. Unified Communications and Network Performance Management
10. Network Segmentation and Virtualization
11. Wide Area Networks
12. Industrial and Enterprise Networking

The instructor reserves the right to modify the Plan of Instruction by changing the sequence of text material or testing content.

Revised August 2019

Institutional Policies

COVID 19

GTC's COVID-19 Response Team continues to monitor the pandemic and to provide guidance to those affected, helping the college mitigate the spread of disease. Although the college is doing everything possible to keep students and employees safe, the college's best weapon against COVID-19 is you. In addition to wearing a mask if required, everyone is strongly encouraged to get vaccinated, to stay home when you are sick, and to follow guidelines that protect you and others from COVID-19, so that we can all get back to normal. If you test positive or have COVID related symptoms please complete a [COVID-19 reporting form](#) right away. To stay up-to-date on the College actions regarding COVID, refer to the [student information page](#) (https://www.gvltec.edu/about_greenvilletech/administration_governance/covid-19-response/student-info.html) on the college website.

Course Evaluations

Student input is necessary for improving instruction at GTC and is requested primarily through course evaluations. Students will be notified when evaluations are available. The College welcomes your feedback and strongly encourages each student to complete the evaluation.

Instructional Agreement

This syllabus is an agreement between the student and instructor concerning course objectives, course content, grading, and other policies and procedures particular to the course as well as any posted program, departmental, and divisional policies. It is also the student's responsibility to become familiar with the Student Handbook/College Catalog found in the Student Resources area of Blackboard.

Technology Statement

Greenville Technical College is not responsible for personal technology or Internet access. Problems with computers, devices, or Internet access are not acceptable for late work. When completing gradable coursework online, be sure to access a secure, reliable internet connection (preferably hardwired). All technical questions should be directed to [GTC Tech Support](#).

https://www.gvltec.edu/about_greenvilletech/tech_support

Students can access due dates for all assignments and quizzes/tests on the Course Schedule/Plan of Instruction. All graded work is time-stamped when submitted, so your instructor can check the time of submission. In addition, you will receive a confirmation email message when you submit assignments via Blackboard. You must provide this confirmation information in case of any dispute regarding the submission.

Computer labs (https://www.gvltec.edu/student_resources/computer_labs/) are available at multiple campus locations and offer various hours as well as staff who are available for assistance. Refer to the **Computing Facilities Use Policy** (<https://catalog.gvltec.edu/student-handbook/campus-safety-security/>) in the student handbook.

Students should use Microsoft Office programs or PDF format for submitting assignments in Blackboard. Students can access the **Microsoft portal** (<http://portal.office.com>), log in with their @my.gvltec.edu email address and Blackboard/GTC4me password, then follow the prompts to install Microsoft Office free of charge.

Students enrolled in any course, regardless of delivery method (face-to-face, online, blended), may incur additional expenses such as equipment (microphone and/or web cam) and test proctoring.

Verification of Students in Online Testing

Greenville Technical College is committed to student learning and the academic integrity of all courses. All GTC online courses are required to have at least one proctored learning activity that constitutes a significant percentage of the course grade, which may include a test, midterm, final exam, presentation or other assignment. Instructors teaching face-to-face and/or blended courses may also elect to use online testing. Proctored is defined as an experience where an approved person ensures the identity of the student and monitors the learning activity. The proctored learning activity will be determined by the course instructor. The method of proctoring and any additional requirements, such as costs for students and/or trips to campus or approved testing center, will be explained in the course schedule/plan of instruction.

Proctorio

"Proctoring assessments, online or in-person, safeguards exam and course integrity. This is essential to protecting the value of certification and degree programs. Proctorio offers our users the opportunity and flexibility to achieve their educational and career goals.

With our remote proctoring services, institutions are able to produce candidates with the necessary skills to succeed throughout life and within their chosen career."

Instructions for Students (https://drive.google.com/file/d/14D8g60E3PFy5FiHGO23-923WYj_v_5ua/view?usp=sharing)

Instructional Continuity

In the event of a disruption to the normal class schedule or planned activities for this course, alternate learning activities that may include other methods of instruction or locations may be implemented. If disruption occurs, your instructor will communicate through your GTC email (Gmail) account. Additionally, please make sure your contact information is accurate in GTC's emergency alert system (accessible in GTC4Me/Quick Access/GTC Emergency Messaging).

In the event of inclement weather, refer to the **College's website** (https://www.gvltec.edu/about_greenvilletech/administration_governance/admin_policies/inclement-weather.html) for up-to-date information.

Administrative Withdrawals

Students may be administratively withdrawn from this course for the following reasons:

- **NIC (Never in Class)** Not attending a course during the drop/add period including failure to meet the attendance criteria in an online course. In this case, a grade of WA will be assigned. This WA will not count as an attempt and will not affect GPA.
- **14-Day Rule:** At any time during the semester and regardless of a student's use of financial aid benefits, the college will withdraw a student who is not in attendance for 14 consecutive calendar days including weekends, holidays, college breaks, and cancelled class sessions.
 - *Prior to the course withdrawal date*, the college policy is to assign a grade of W (Withdrawal). The student will earn no

credits or grade points, and the W will not affect GPA. For students receiving financial aid, the course will count as an attempt and may affect future aid.

- **After the course withdrawal date**, the college will assign a grade of WF for the course which will negatively affect GPA calculation. The student will be responsible for course payment and will not be eligible for a refund. The college will notify the student of the administrative withdrawal via official college email address. For students receiving financial aid, the course will be recorded as an attempt and may affect future financial aid awards.

Students may request a reinstatement. Reinstatements must be approved by the course instructor. There is a \$75 reinstatement fee.

Dropping, Adding, and Withdrawing from Courses

Students may drop courses during the add/drop period for each courses; student may add courses during the same period only before the class actually meets. Courses dropped during this period will not appear on the transcript. Students who withdraw from a course prior to the withdrawal deadline will earn a grade of W for that course, and the W will be reflected on the transcript. Refer to the college refund policy for information concerning refunds.

Students should not assume that they will be administratively withdrawn if they stop attending classes. **It is the student's responsibility to complete the process to withdraw from a course or courses prior to the published withdrawal deadline.** Students may withdraw from any or all courses either [electronically](https://www.gyltec.edu/admissions_aid/student_forms/AddDropWithdrawal-Form.pdf) (https://www.gyltec.edu/admissions_aid/student_forms/AddDropWithdrawal-Form.pdf) or through the Office of Student Records. Some students such as transient and career development students must complete the withdrawal process through the Office of Student Records. Any hold on a student's account (due to fines owed or similar obligations to the college) will prevent a student from withdrawing electronically.

The dates for add, drop, and withdrawal are tied to the particular session code and class section number as well as the start and end dates for each course. For example, a student who withdraws from a first session course and adds a second session course will incur tuition charges for both courses even if they are the same course.

NOTE: Students are responsible for meeting the posted course withdrawal deadlines.

For additional information on dropping, adding, or withdrawing from a course, visit the [College website](https://www.gyltec.edu/student_resources/student_records/add-drop.html) (https://www.gyltec.edu/student_resources/student_records/add-drop.html).

Incomplete Policy

An **Incomplete** is defined as academic work for which unforeseeable, emergency and justifiable reasons, has not been finished at the end of the term. Emergencies and justifiable reasons do *not* include: an opportunity to raise the grade earned; a student not taking the final exam without notification to the instructor as to why; or, using the incomplete as a means to retake a portion of the course due to a non-passing grade.

Guidelines:

1. Student must have completed a vast majority of the work required for the course. Usually, the vast majority of work means at least 75% of the assignments required for grading must have been completed.
2. Student must be passing the course with a C or better average.
3. No incompletes will be given prior to the last day to withdraw.
4. Student must request an incomplete in writing prior to an instructor's submission of the final grade.
5. Students receiving an incomplete cannot enroll in a class for which the course receiving an "I" is required as a prerequisite until the "I" has been replaced by an applicable letter grade.
6. The incomplete may be made up no later than one semester after the end of the term in which it was assigned, at which time, the instructor's grade shall be entered on the student's academic record.
7. The annotation of the record shall indicate the change from "I" to the grade earned.
8. A student may petition for an extension of one semester of time due to unusual circumstances. Such a petition will be reviewed by the instructor whose decision shall be forwarded to the Department Head.

Students with Disabilities

Students with disabilities, including those who were served in Special Education (resource or tutorial), should contact [Student](#)

[Disability Services \(http://gvltec.edu/disability-services\)](http://gvltec.edu/disability-services) (SDS) to discuss their need for services and accommodations. This process must be completed each term. The main SDS office is located on the Barton Campus in the Student Center Building 105, office 113.

Students may reach staff by phone at 864-250-8202 or via [email \(mailto:DisabilityServices@gvltec.edu\)](mailto:DisabilityServices@gvltec.edu). Appointments are available at all satellite campus locations.

The college is committed to providing materials that are accessible to all students. However, if you experience any difficulty accessing materials, please notify your instructor immediately so that we can provide a solution. You may also contact Student Disability Services directly at 864-250-8202 or via [email \(mailto:DisabilityServices@gvltec.edu\)](mailto:DisabilityServices@gvltec.edu).

Students who need a PDF reader to access course documents presented in PDF formats may download [Adobe Reader \(https://get.adobe.com/reader\)](https://get.adobe.com/reader).

Blackboard Ally

Blackboard Ally is a tool to improve students' experiences within online courses. It enables students to convert files in a course to more accessible formats such as HTML, electronic braille, audio and more. For more information, refer to [Blackboard Ally for Students \(https://www.softchalkcloud.com/lesson/serve/XVETeqkBpJlWdZ/html\)](https://www.softchalkcloud.com/lesson/serve/XVETeqkBpJlWdZ/html) located in Student Resources in the course menu.

FERPA Policy

Because Greenville Technical College abides by FERPA privacy guidelines, personal email accounts may not be used for any College-related communication. Faculty and students must use the college Gmail system only.

Title IX Policy

Greenville Technical College provides equal opportunity and affirmative action in education and employment for all qualified persons regardless of race, color, religion, sex, national origin, age, disability, sexual orientation, or veteran status.

Greenville Technical College does not discriminate against any student on the basis of pregnancy or related conditions and will comply fully with Title IX regulations.

Absences due to medical conditions relating to pregnancy and maternity leave will be excused for as long as deemed medically necessary by a student's doctor, and the student will be given the opportunity to makeup missed work. Documentation from the student's doctor is required. Students needing assistance may seek accommodations from the Title IX Coordinator or Student Disability Services. Please contact the Title IX Coordinator via [email \(mailto:TitleIX@gvltec.edu\)](mailto:TitleIX@gvltec.edu) or Student Disability Services via [email \(mailto:DisabilityServices@gvltec.edu\)](mailto:DisabilityServices@gvltec.edu) for additional information.

Non-Discrimination Policy

Greenville Technical College provides equal opportunity and affirmative action in education and employment for all qualified persons regardless of race, color, religion, sex, national origin, age, disability, sexual orientation, or veteran status.

The college complies with the provisions of Titles VI and VII of the Civil Rights Act of 1964, as amended; Title IX of the Education Amendments of 1972 and the Higher Education Amendments of 1986; Sections 503 and 504 of the Rehabilitation Act of 1973, as amended; the South Carolina Human Affairs Law of 1972; and with the Americans with Disabilities Act (ADA) of 1990 as well as the ADA Amendments of 2008 (ADAA).

For additional information on nondiscrimination policies, students should contact Student Disability Services, which coordinates Title II of the ADA/ADAA, Section 504 at 864-250-8202; Title IX Coordinator at 864-250-8144.

Assistance with Food and Housing

The faculty and staff of GTC, along with our fantastic GTC Foundation, are invested in removing barriers to your success at GTC throughout your academic career. The **STAR (Student Assistance and Resources) Center** can help if you are struggling with basic needs insecurity, such as food and toiletries, at our on-campus food pantries. We can also help connect students to resources in the community that can assist with rent and other types of assistance.

You can visit our webpage at: https://www.gvltec.edu/student_resources/student_support/transitions/index.html to learn more.

Schedule

Course Schedule (Plan of Instruction)

Please refer to Syllabus Addendum in Blackboard to review the Tentative Course Schedule. Your instructor will provide a detailed, week-by-week plan of instruction via addendum along with method of delivery, testing, and assignment submission.

Date	Topic	Tasks
Unit 1	Course Introduction & Number Systems Conversions (Decimal, Binary, Hexadecimal)	Course Introduction Number Systems Conversions (Decimal, Binary, Hexadecimal) Chapter 1 Review Syllabus Quiz Assignment - International Organization for Standardization
Unit 2	Introduction to Networking & Network Infrastructure	Chapter 1 Introduction to Networking Chapter 2 Network Infrastructure (Independent Study outside of class) Chapter 2 Review
Unit 3	Numbering Systems and Conversions (Decimal, Binary, Hexadecimal)	Numbering Systems and Conversions (Decimal, Binary, Hexadecimal) Numbering Systems Quiz IP Commands Chapter 3 Review
Unit 4	Addressing on Networks	Chapter 3 Addressing on Networks Chapter 8 Review Assignment - Identifying IPv6 Addresses
Unit 5	Subnets and Vlans (Up to VLSM)	Chapter 8 Subnets and Vlans (Up to VLSM) Lab Simulation 5-2: Test the Efficiency of your Network Subnetting #1
Unit 6	Subnets and Vlans (Remainder of Chapter)	Chapter 8 Subnets and Vlans (Remainder of Chapter) Subnetting #2 Exploring Vlans Chapter 4 Review
Unit 7	Network Protocols and Routing	Chapter 4 Network Protocols and Routing Subnetting #3 Chapter 5 Review
Unit 8		Chapter 5 Lab Simulation 2-1: Install Zenmap and Scan the Network Chapter 6 Review Subnetting #4
	MidTerm Exam	MidTerm Exam

Date	Topic	Tasks
Unit 10	Wireless Networking	Chapter 6 Wireless Networking Lab Simulation 3-2: Perform DNS Lookups on Different Servers Lab Simulation 3-1: Use Wireshark to Lookup and Record Network Addresses Chapter 7 Review
Unit 11	Virtualization and Cloud Computing & Network Performance Recovery	Chapter 7 Virtualization and Cloud (Selected Portions) and Subnetting Chapter 11 Network Performance Recovery (Independent Study Outside of Class) Chapter 11 Review Chapter 10 Review
Unit 12	Security in Network Design	Chapter 10 Security in Network Design(Selected Portions) and Subnetting Chapter 12 Review Lab Simulation 10-2: Use Windows Defender Firewall to Block Specific
Unit 13	Wide Area Networks	Chapter 12 Wide Area Networks Subnetting #5
Unit 14	Review for Skills Exam	Review for Skills Exam Subnetting #6
	Skills Exam	Skills Exam
	Final Exam	Final Exam