



## Course Number and Title: ELC 206 Computer Networks and Systems II

**Campus Location:**

Stanton

**Effective Date:**

2018-51

**Prerequisite:**

ELC 205, ELC227, CEN 180

**Co-Requisites:**

none

**Course Credits and Hours:**

3.00 credits

2.00 lecture hours/week

3.00 lab hours/week

**Course Description:**

This course is a continuation of data communications and computer network principles and applications in which students configure, troubleshoot, and secure networks and related peripherals.

**Required Text(s):**

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

**Additional Materials:**

USB flash-drive for lab work and Internet access

**Schedule Type:**

Classroom Course

Hybrid Course

Online Course

**Disclaimer:**

None

**Core Course Performance Objectives (CCPOs):**

1. Explain the characteristics of network support and management. (CCC 2, 3, 4, 5; PGC 1, 2)
2. Explain the concepts of basic network security. (CCC 2, 3, 4, 5; PGC 1, 2)
3. Implement and administer network security. (CCC 2, 3, 4, 5; PGC 1, 2)
4. Explain networking operating systems and server based networking. (CCC 2, 3, 4, 5; PGC 1, 2)
5. Describe the basic concepts of networking with Unix/Linux operating systems. (CCC 2, 3, 4, 5; PGC 1, 2)
6. Secure networks using cryptograph techniques. (CCC 2, 3, 4, 5; PGC 1, 2)
7. Employ environmental controls to prevent network disruptions. (CCC 2, 3, 4, 5; PGC 1, 2)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

## Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Explain the characteristics of network support and management.
  1. Explain network and project management.
  2. Describe the use of hardware and software troubleshooting tools.
  3. Explain the troubleshooting process, backups, and baselines.
  4. Explain performance and fault management.
  5. Perform network monitoring to identify performance and connectivity issues.
2. Explain the concepts of basic network security.
  1. Give examples of network security concerns.
  2. Identify the characteristics of a firewall, proxy server, and antivirus software.
  3. Resolve security problems using firewalls, routers, switches, hubs, and modems.
  4. Prepare an effective security policy.
  5. Examine the issues involved in network operating system security.
  6. Differentiate between wired and wireless network security.
3. Implement and administer network security.
  1. Explain different data formats used to present and secure data.
  2. Use security configuration and analysis tools to analyze and configure local system security.
  3. Design and build secure networks using simulation software.
  4. Use a network analyzer to troubleshoot and analyze data on a network.
4. Explain networking operating systems and server based networking.
  1. Describe the Windows Server memory model.
  2. Describe the Windows Server file systems.
  3. Explain the Microsoft memory console (MMC).
  4. Explain the active directory.
  5. Install and configure server software.
  6. Create group and user accounts.
  7. Harden the network against common attacks like back door, spoofing, replay, man-in-the-middle, transmission control protocol/Internet protocol (TCP/IP), hijacking, and password guessing attacks.
  8. Protect the network from viruses, Trojan horses, logic bombs, and worms.
5. Describe the basic concepts of networking with Unix/Linux operating systems.
  1. Explain Unix/Linux multiprocessing.
  2. Explain the Unix/Linux kernel.
  3. Explain the Unix/Linux memory model.
  4. Explain the Unix/Linux file and directory structure.
  5. Use basic Unix/Linux commands using command line interface.
  6. Explain file permissions.
  7. Write simple shell scripts.
  8. Configure Linux.
  9. Explain Linux administration.
  10. Setup groups and users.
6. Secure networks using cryptograph techniques.
  1. Describe hash, symmetric, and asymmetric cryptographic algorithms.
  2. Explain the various ways in which cryptography is used.
  3. Define *digital certificates*.
  4. Explain the various types of digital certificates and how they are used.
  5. Describe the components of public key infrastructure (PKI).
  6. Describe the tasks associated with key management.
  7. Describe the different transport encryption algorithms.
7. Employ environmental controls to prevent network disruptions.
  1. Describe the components of redundancy planning.
  2. Describe disaster recovery procedures.
  3. Describe incident response procedures.
  4. Explain how to control risk.
  5. Explain types of security policies.
  6. Describe how awareness and training can provide increased security.

**Evaluation Criteria/Policies:**

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

**Core Curriculum Competencies (CCCs are the competencies every graduate will develop):**

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

**Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):**

1. Perform the duties of an entry-level technician using the skills, modern tools, theory, and techniques of the electronics engineering technology.
2. Design or improve electrical/electronics systems using critical thinking, theoretical knowledge, and practical understanding.
3. Conduct, analyze, and interpret experiments using analysis tools and troubleshooting methods.
4. Demonstrate basic management, organizational, and leadership skills.
5. Explain the importance of engaging in self-directed continuing professional development.

**Disabilities Support Statement:**

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.