

Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: CIS 132

Year: 2025-2026

Course Title: Network Design

Credit Hours: 3

**I. Course Description:** This course covers design, installation, and maintenance of networks. Topics include installation of hardware and network software, application software, system configuration, hardware and software testing, and configuration of access rights. Discussion of different network topologies, medium, and software are also included. Prerequisites: CIS 108 or similar coursework in information technologies 3 Cr. (2 Lec., 2 Lab.) Spring semester.

**II. Additional Course Information:**

- |  |
|--|
| 1. CIS 132 is required for degree completion in the Computer Information Systems, A.A.S. and in the Computer Support Specialist, A.A.S.. |
| 2. This course is offered only in Spring semesters.  |

**III. Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- |   |
|---|
| 1. Demonstrate a comprehensive understanding of all layers of the Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnection (OSI) Models.                   |
| 2. Build and configure Internet Protocol (IP) Addressing, including network identification, subnetting, and additional networking architectures to develop and troubleshoot routing schema. |
| 3. Apply various routing protocols and cabling options to network scenarios.  |
| 4. Configure various switching technologies, including virtual local area networks (VLANs), trunk and access ports, remote access, and additional networking architecture.                  |
| 5. Analyze network configurations and propose and implement secure solutions to protect data assets and mitigate potential attacks.   |

**IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Competencies and Knowledge and Skills Areas**

**Tompkins Cortland ILOs - N/A**

Complete this section for “service” courses only (e.g., courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

- Communicate effectively, in oral and written forms, taking into consideration audience and purpose.
- Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

- Use information, critical thinking, and the creative process to solve problems and reach conclusions.
- Use technology appropriate to their discipline.
- Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

### **Program Learning Outcomes**

Complete this section for program-specific courses (e.g., those that share the same discipline code as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

#### **Computer Information Systems A.A.S.**

PLO- Apply concepts of programming, data storage, networking, and hardware/software support to creative solutions for business projects and organizational challenges.

SLO 2 - Build and configure Open Systems Interconnection (OSI) Addressing, including network identification, subnetting, and additional networking architectures to develop and troubleshoot routing schema

PLO- Participate in team/group work applying concepts to real world projects based on business scenarios.

SLO 5 - Analyze network configurations and propose and implement secure solutions to protect data assets and mitigate potential attacks.

PLO- Describe the concepts and principles of the information technology field and the role it plays in today's business organization.

SLO 3 - Apply various routing protocols and cabling options to network scenarios

PLO- Explain the methods in which the application of information technology can improve the efficiency of current business models.

SLO 4 - Configure various switching technologies, including VLANs, trunk and access ports, remote access, and additional networking architecture

#### **Computer Support Specialist A.A.S.**

PLO- Apply concepts of programming, data storage, networking, and hardware/software support to creative solutions for business projects and organizational challenges.

SLO 2 - Build and configure Open Systems Interconnection (OSI) Addressing, including network Identification, subnetting, and additional networking architectures to develop and troubleshoot routing schema

PLO- Participate in team/group work applying concepts to real world projects based on business scenarios.

SLO 5 - Analyze network configurations and propose and implement secure solutions to protect data assets and mitigate potential attacks.

PLO- Describe and apply the concepts and principles of modern computer system hardware/software installation, repair, maintenance, and upgrade.

SLO 1 - Demonstrate a comprehensive understanding of all layers of the Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnection (OSI) Models.

PLO- Develop and apply creative trouble shooting techniques to diagnose hardware/ software/ Network Problems.

SLO 4 - Configure various switching technologies VLANs, trunk and access ports, remote access, and additional networking architecture.

**SUNY General Education Competencies- N/A**

If this course assesses a SUNY GEN ED Competency, check all that apply and indicate which course outcome(s) address each checked item:

CRITICAL THINKING & REASONING- Students will:

- a. clearly articulate an issue or problem;
- b. identify, analyze, and evaluate ideas, data, and arguments as they occur in their own or others' work; acknowledge limitations such as perspective and bias; and
- c. develop well-reasoned (logical) arguments to form judgments and/or draw conclusions.

INFORMATION LITERACY - Students will:

- a. locate information effectively using tools appropriate to their need and discipline; evaluate information with an awareness of authority, validity, and bias; and demonstrate an understanding of the ethical dimensions of information use, creation, and dissemination.

SUNY GENERAL EDUCATION Knowledge and Skills Area(s): **N/A**

For courses that are approved to meet one (or more) of the ten SUNY General Education Knowledge and Skills Areas, indicate which category the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that area:

This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Competencies or Knowledge and Skills Areas.

**V. Essential Topics/Themes**

|  |
|--|
| 1. Transmission Control Protocol/Internet Protocol TCP/IP) and Open Systems Interconnection (OSI) Models |
| 2. Network Design scenarios  |
| 3. Routing Protocols   |
| 4. Switch Protocols  |
| 5. Network Management  |

**VI. Methods of Assessment/Evaluation**

| Method                    | % Course Grade |
|---------------------------|----------------|
| 1. Topic review questions | 15-30%         |
| 2. Lab Activities         | 15-30%         |
| 3. Quizzes/Tests          | 15-30%         |
| 4. Projects               | 15-30%         |

VII. Texts –  Required     Recommended     Used for more than one course (list courses)

|   | OER                                 |
|---|-------------------------------------|
| 1. Cisco CCENT/CCNA ICND1 Official Cert Guide Academic edition 2013 Wendell Odom<br>Pearson education Cisco Press | <input checked="" type="checkbox"/> |

*Editions listed are current as of date of syllabus. More recent editions may be used.*

VIII. Bibliography of Supplemental Materials

|  |
|--|
| 1. Cisco Academy <a href="https://www.netacad.com/">https://www.netacad.com/</a> |
|--|

*Editions listed are current as of date of syllabus. More recent editions may be used.*

IX. Other Learning Resources

**Audiovisual:** Online YouTube videos

**Electronic:** Packet tracer software

**Other:** None specified

**Attendance Policy:** *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

**Services for Students with Disabilities:** *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

**Academic Integrity:** *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*

*Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.*

*Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.*