

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

COMPUTER AND INFORMATION SCIENCE 125 – NETWORK+ CERTIFICATION

2 hours lecture, 3 hours laboratory, 3 units

Catalog Description

Practical course intended for those interested in learning computer networking with an emphasis on earning the Computing Technology Industry Association's certification Network+, a foundation-level, vendor-neutral international industry credential that validates the knowledge of networking professionals. Earning this certification demonstrates that a candidate can describe the features and functions of networking components, and possesses the knowledge and skills needed to install, configure and troubleshoot basic networking hardware, protocols and services. It also indicates technical ability in the areas of media and topologies, protocols and standards, network implementation, and network support. Throughout the course, theory will be demonstrated and practiced in laboratory exercises. Lectures, laboratories and practical assignments will emphasize skills needed to work effectively in the networking environment and to earn the Network+ certification.

Recommended Preparation

Basic computer skills (basic knowledge of hardware, operating systems, applications software)

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Basic knowledge of computer hardware components and their functions.
- 2) Basic skills using Microsoft Windows operating system.
- 3) Familiarity with Microsoft Office products.
- 4) Use a web browser to browse, navigate and conduct research.
- 5) Follow written instructions.

Course Content

- 1) Introduction to Computer Networking
- 2) Networking Standards and the OSI Model
- 3) Transmission Basics and Networking Media
- 4) Network Protocols
- 5) Networking Hardware
- 6) Topologies and Ethernet Standards
- 7) WANs, and Remote Connectivity
- 8) Wireless Networking
- 9) Network Operating Systems
- 10) In-Depth TCP/IP Networking
- 11) Troubleshooting Network Problems
- 12) Ensuring Network Integrity and Availability
- 13) Network Security
- 14) Voice and Video Over IP
- 15) Network Management

Course Objectives

Students will be able to:

- 1) Differentiate between computer network topologies, standards, models, and protocols that are used by the networking community and describe each of their characteristics and functions.
- 2) Describe the computer networking systems hardware and software components necessary to complete a computer network and identify each of their characteristics and functions, and utilize compatible components to build a functioning computer network.
- 3) Design, build and operate an Ethernet Local Area Network utilizing skills learned in class.
- 4) Identify prevailing security risks to computer networks (including wireless security) and explain the precautions used to ensure adequate computer network security that keep data safe from viruses, loss, or damage.
- 5) Develop a networking solution to a real-world business networking problem using network design software and techniques learned in class.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Quizzes and exams that measure students' ability to use networking terminology and to explain networking concepts, plans, designs, implementation and troubleshooting concepts.
- 2) Practical exams that measure students' ability to use networking knowledge and skills to demonstrate proficiency in network topologies, protocols, hardware and software components.
- 3) Projects that measure students' ability to conceptualize, build, maintain, upgrade and troubleshoot computer networks.
- 4) Exercises that measure students' ability to identify security, reliability and availability concerns, and to address those concerns with practical solutions.

Special Materials Required of Student

- 1) File storage system
- 2) Access to web-based course material specified in syllabus

Minimum Instructional Facilities

Computer lab with Internet access, appropriate software

Method of Instruction

- 1) Lecture and demonstration
- 2) Hands-on practice
- 3) Assignments

Out-of-Class Assignments

- 1) Read textbook and assignment instructions
- 2) Complete assignments and online quizzes
- 3) Review online resources, including videos

Texts and References

- 1) Required (representative example): LabSim Network Pro for the Network+ N10-007 exam from TestOut corporation. ISBN-13: 978-1-935080-43-5.
- 2) Supplemental:
CompTIA Network+ Practice Tests: N10-007, 6th edition, by Craig Zacker, 2018. ISBN-13: 978-1119432128.

Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Identification and description of computer network concepts.
- 2) Identification and description of network topologies.
- 3) Skill in planning, designing, implementing, optimizing and troubleshooting computer networks.
- 4) Identification and description of the OSI model and TCP/IP.
- 5) Descriptive assessment of the characteristics of a network that keep data safe from viruses, loss or damage.
- 6) Describe and analyze the implementation, structure, and use of LANs, MANs and WANs.
- 7) Describe and analyze the functions of repeaters, hubs, bridges, switches, routers and gateways, and the OSI Model layers at which they operate.

Student Learning Outcomes

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

- 1) Complete a comprehensive project including hands-on/simulated installation, upgrade, troubleshooting, and maintenance of a computer network (>6 elements) that meets 70% of the technical, organizational, structural, and presentation requirements outlined in a detailed scoring rubric based on the course content and objectives.