

Common Course Outline
DCOM 101
Introduction to Data Communications
3 Semester Hours

The Community College of Baltimore County

Description

DCOM 101 – 3 Credits – Introduction to Data Communications explores converging computer and communications technologies including transmission concepts, network hardware, software, protocols, and standards. The material covered in this class provides the broad-based knowledge necessary to prepare students for further study in specialized networking fields, or may be used by those interested in a general introduction to the field.

3 credits; 3 lecture hours per week

Co-requisite: CINS 101

Overall Course Objectives

Upon completion of this course the student will be able to:

1. illustrate the characteristics and components of a network;
2. analyze network requirements;
3. define the role of networking models and standards in creating dependable networks;
4. describe the minimum hardware requirements for a network;
5. explain the signaling techniques used on modern networks;
6. differentiate between different types of protocols;
7. discuss the most common ways to ensure network availability;
8. describe the variety of physical and logical topologies used to build networks;
and
9. utilize network diagrams.

Major Topics

- I. Introduction to Networks and Networking Concepts
 - a. Describe general network terms, categories, and characteristics
 - b. Discuss the history of data communications
 - c. Explore the factors driving the convergence of networking and communications technologies

- II. Data Transmission
 - a. Describe the movement of digital information from one system to another by means of an electrical or optical transmission system
 - b. Use the Base 2 numbering system
 - c. Differentiate between different coding schemes (e.g., ASCII, EBCDIC)
 - d. Discuss the differences between digital and analog transmissions
 - e. Describe what modulation, amplitude, frequency, and phase are
 - f. Discuss asynchronous and synchronous transmissions
 - g. Describe multiplexing
- III. Network Design Essentials
 - a. Discuss the standard network topologies
 - b. Describe how repeaters, hubs, switches, and network interface cards work
- IV. Networking Media
 - a. Discuss the primary media types and properties
- V. Making Networks Work
 - a. Discuss the role of the Open Systems Interconnection (OSI) and Defense Advanced Research Project Agency (DARPA) networking models
 - b. Differentiate between the Institute of Electrical and Electronic Engineers (IEEE) 802 networking specifications
- VI. Network Protocols
 - a. Describe the function of packets
 - b. Discuss the function of protocols
 - c. Differentiate between common protocol suites
 - d. Detail media access methods
- VII. Network Architectures
 - a. Describe the different Ethernet technologies
 - b. Discuss Token Ring technologies
 - c. Describe Fiber Distributed Data Interface (FDDI) technologies
 - d. Describe Asynchronous Transfer Mode (ATM) and Synchronous Optical Network (SONET) technologies and signaling rates
 - e. Discuss trends in high performance computing
- VIII. Network Operating Systems
 - a. Discuss what a NOS is
 - b. Describe installing and administering a NOS
 - c. Discuss the software components required for networking
 - d. Discuss popular networking services/applications
- IX. Enterprise and Wide Area Networking (WAN)
 - a. Describe the types of modems used in networked communications
 - b. Discuss remote access networking architectures
 - c. Describe what a Virtual Private Network (VPN) is, common types, and uses
 - d. Discuss networking hardware used to create larger networks: routers, brouters, and gateways and describe the differences between them
 - e. Describe different WAN transmission technologies: X.25, Frame Relay, Integrated Services Digital Network (ISDN), etc.
 - f. Discuss network security as it relates to firewalls, routers, Network Address Translation (NAT), and Intrusion Detection Systems (IDSes)

Course Requirements

Grading/exams: Procedures for grading will be determined by the individual faculty member, but will include:

- A minimum of seven graded assignments.
- A comprehensive final examination.
- Other graded assignments may come from any combination of the following categories: quizzes, hourly exams, a midterm exam, group projects, or individual reports/presentations.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.