GROSSMONT COLLEGE

COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 04/20/2021

GCCCD Governing Board Approval: 05/18/2021

COMPUTER SCIENCE INFORMATION SYSTEMS 145 – INTRODUCTION TO TCP/IP

1. Course Number Course Title Semester Units

CSIS 145 Introduction to TCP/IP 2

Semester Hours

2 hours lecture: 32-36 hours 64-72 outside-of-class hours 96-108 total hours

2. Course Prerequisites

None

Corequisite

None.

Recommended Preparation

A “C” grade or higher or “Pass” in CSIS 125 or equivalent.

3. Catalog Description

This course introduces the student to the operation of the Transmission Control Protocol/Internet Protocol (TCP/IP) standard and related protocols. The course will cover the underlying components and protocols that make up the Internet. Tools used to navigate and access information on the Internet will be studied.

4. Course Objectives

The student will:

1. Setup access to common TCP/IP applications.
2. Analyze the TCP/IP layers, components, and functions, and map these to the OSI model.
3. Describe and implement TCP/IP application services that support electronic mail, remote terminal access, network management, Web access, and file transport across routed networks.
4. Design and implement subnetworks and Classless Interdomain Routing (CIDR).
5. Design and implement Choose a routing protocol based a network size and service requirements, including QoS/ToS routing, VLSM, and link redundancy.
6. Evaluate the TCP/IP protocols used to transport data over intranets, extranets, and the Internet.
7. Describe how TCP/IP supports converged voice and data networks.
8. Use TCP/IP tools to troubleshoot and isolate internetwork communications failures.
9. Compare the protocols used to transmit data over the Internet.

5. Instructional Facilities

Standard Classroom

6. Special Materials Required of Student

Removable storage media compatible with lab computers.

7. Course Content

a. Access to common TCP/IP applications

1) Web browsers and servers

2) Common uses of TELNET and File Transfer Protocol

3) Simple mail transfer protocol

4) Network management

1. TCP/IP structure and addressing
   1. Internet protocol suite
   2. Internet protocol addressing
   3. The creation of subnets
   4. The concept of Address resolution
   5. Domain name system
   6. Internet control and group management protocol
2. TCP/IP protocols
   1. Internet protocols
   2. Internet protocol routing
   3. User datagram protocol
   4. Transmission control protocol, connection establishment and data transmission
   5. Moving information across a TCP/IP network
3. TCP/IP Services
   1. DNS
   2. ICMP
   3. IGMP
   4. BOOTP
   5. DHCP
   6. NAT
   7. IPv6
4. TCP/IP Addressing and subnets
   1. Number Conversion
   2. Subnetting Fundamentals
   3. Subnetting Class C Networks
   4. Subnetting Class B Networks
   5. Subnetting Class A Networks
   6. CIDR

f. Routing TCP/IP

* + - 1. IP Routing
      2. How Routers Share Routing Information
      3. RIP
      4. IGRP
      5. OSPF
      6. Advanced Routing
    1. TCP/IP Applications

1. Web Browser and Web Server Step-by-Step
2. Telnet
3. FTP
4. SMTP
5. Network Management
6. H.323 Standard for Packet Multimedia

h. How does e-mail work?

* 1. Reading an IP address
  2. E-mail protocols
  3. Mail server configuration
  4. Store-and-forward mail systems

i. Troubleshooting a TCP/IP network

8. Method of Instruction

a. Lecture

b. Demonstrations

c. Hands-on practice in either a dedicated or a virtual lab environment

d. Topical discussion of current networking trends and issues

9. Methods of Evaluating Student Performance

a. Skills demonstration, such as written quizzes and exams, to include a final examination, that measure students’ ability to describe computer programming principles, as well as the ability to analyze a scenario and choose the among the alternative paths.

b. Application exercises and Projects, such as scenario-based lab activities and projects that measure students’ ability to design and create networking scenarios that work efficiently and effectively.

10. Outside Class Assignments

a. Applications exercises, such as determining network requirements, designing an efficient and effective layout and implementing that scenario.

b. Reading assignments throughout the textbook.

c. Complete Study Guides provided covering major topics.

d. Troubleshoot/analyze imposed networking scenarios, investigate potential alternatives, and implement action to achieve a determined result.

e. Complete and pass section quizzes and course final exam.

f. Read and analyze instructor assigned case studies; post analysis and comments to the class discussion board.

g. Respond to other students’ analysis and comments on the class discussion board.

11. Representative Texts

a. Representative Text(s):

Pyles, Carrell, and Tittel. *Guide to TCP/IP*, 5th Edition, Cengage Learning, 2017.

b. Supplementary texts and workbooks:

None

Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

1. Analyze/understand the requirements of a given problem.
2. Develop an acceptable design solution.
3. Implement a solution.