STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

CYBR/CITA 220 - DATA COMMUNICATIONS AND NETWORK TECHNOLOGY

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SCHOOL OF SCIENCE, HEALTH AND CRIMINAL JUSTICE
CENTER FOR CRIMINAL JUSTICE, INTELLIGENCE AND CYBERSECURITY
FALL 2022

A.   TITLE: Data Communications and Network Technology

B.   COURSE NUMBER: CYBR/CITA 220

C.   CREDIT HOURS: 3
- 3 hours of lecture per week

D.   WRITING INTENSIVE COURSE: No

E.   GER CATEGORY: None

F.   SEMESTER(S) OFFERED: Fall/Spring

G.   COURSE DESCRIPTION: A study of terminology, hardware and software associated with data communications and network technology. Areas of study include design principles for human-computer dialogue, selection criteria for communications devices, the technology of data transmission, techniques and message protocols for line control and error processing, local area networks, networking concepts, network topologies and access control, network performance, network services and design issues, and network media and access methods. Design, configuration, operation and maintenance questions are explored. Topics include end-user perspective, network operating systems, cabling, hardware protocols, software and applications, design, and administration. This course should be taken concurrently with CITA 221 Data Communications and Network Technology Lab course.

H.   PRE-REQUISITES/CO-REQUISITES:

a. Pre-requisite(s): CITA170 Computer Concepts and Operating Systems, CITA 171 Operating System Use and Administration, and MATH 106 Intermediate Algebra
b. Co-requisite(s): none
c. Pre- or co-requisite(s): none

I.   STUDENT LEARNING OUTCOMES:

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	*PSLO*	*ISLO*
a. Describe the properties and limitations of data communications as implemented for the Internet model	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
b. Specify fundamental data transmission concepts underlying data communication practices used in business	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
c. Enumerate the hardware facilities and protocols required in communications systems	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
d. Explain the basic concepts and models of data communications and networks	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
e. Describe the components of data communications and network systems	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5

f. Illustrate the protocols and standards required for networking and inter-networking	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
g. Work in teams to troubleshoot and repair computer equipment	2. Identify issues and collaborate on solutions concerning IT in an effective and professional manner 4. Apply problem solving and troubleshooting skills	2[CA] 4[T] 5

J.   APPLIED LEARNING COMPONENT: **Yes__X___   No_____**

- Classroom/Lab

K. <u>**TEXTS:**</u> Forouzan, B. (2013). Data Communications and Networking, 5/e. Columbus, OH: McGraw-Hill Higher Education.

L. <u>**REFERENCES:**</u> N/A

M. <u>**EQUIPMENT:**</u> Computer lab classroom

N. <u>**GRADING METHOD:**</u> A-F

O. <u>**SUGGESTED MEASUREMENT CRITERIA/METHODS:**</u>
- Exams
- Quizzes
- Participation

P. <u>**DETAILED COURSE OUTLINE:**</u>

I. Fundamentals of Network Technology
    A. Network Models
    B. History of Network Development

II. The Application Layer
    A. Application architectures
    B. Communications
    C. Services
    D. Protocols

III. The Transport Layer
    A. Delivery protocols
    B. Quality of service

IV. The Network Layer
    A. Network models
    B. Services
    C. Addressing
    D. Routing

V. The Data Link Layer
    A. Data Transmission
    B. Switches

VI. The Physical Layer
    A. Communications Hardware
    B. Types of Networks
    C. Wireless and mobile technology
    D. Multimedia

VII. Network Management
    A. Administration

B. Performance and Optimization
C. Design Issues
D. Security

Q.   <u>**LABORATORY OUTLINE:**</u> N/A