CS/IS190 : Introduction to Computer Networks

General Information

Author:	• Vladimir Paransky
Course Code (CB01) :	CS/IS190
Course Title (CB02) :	Introduction to Computer Networks
Department:	CSIS
Proposal Start:	Fall 2024
TOP Code (CB03) :	(0708.10) Computer Networking
CIP Code:	(11.0901) Computer Systems Networking and Telecommunications.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000175434
Curriculum Committee Approval Date:	10/25/2023
Board of Trustees Approval Date:	12/19/2023
Last Cyclical Review Date:	10/25/2023
Course Description and Course Note:	CS/IS 190 introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP (Internet Protocol) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for further study of computer networks. It uses the OSI (Open Systems Interconnection) and TCP (Transmission Control Protocol) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. This course prepares students for the CompTIA Network+ certification exam. The course includes labs to provide hands-on training.
Justification:	Mandatory Revision
Academic Career:	• Credit

Academic Senate Discipline

Primary Discipline:	• Computer Information Systems (Computer network installation, microcomputer technology, computer applications)
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)	Course Special Class Status (CB13)	Grading Basis
Course is not a basic skills course.	Course is not a special class.	• Grade with Pass / No-Pass Option
☐ Allow Students to Gain Credit by Exam/Challenge	**Pre-Collegiate Level (CB21)**	**Course Support Course Status (CB26)**
	Not applicable.	Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

Not Applicable

Transferability

Transferable to CSU only

Transferability Status

Approved

C-ID	Area	Status	Approval Date	Comparable Course
ITIS	Information Technology and Information Systems	Approved	02/16/2016	ITIS 150 - Computer Network Fundamentals

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	72
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

Course Student Hours

	In Class	Out of Class	Course Duration (Weeks)	18
Lecture Hours	2	4	**Hours per unit divisor**	0

Laboratory Hours	3	0
Studio Hours	0	0

Course In-Class (Contact) Hours

Lecture	36
Laboratory	54
Studio	0
Total	90

Course Out-of-Class Hours

Lecture	72
Laboratory	0
Studio	0
Total	72

Time Commitment Notes for Students

No value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

CS/IS101 - Introduction To Computer and Information Systems

Objectives

- Explain the concept of a network; identify hardware and software needed to create a network; compare and contrast wired vs. wireless networks; describe network security issues.
- Demonstrate the importance of the technology infrastructure in an organization; identify major hardware components of a computer system; explain how to evaluate hardware components; compare open vs. proprietary platforms.

Entry Standards

Entry Standards

No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Discussion

Methods of Instruction	Multimedia

Methods of Instruction	Collaborative Learning

Methods of Instruction	Demonstrations

Methods of Instruction	Guest Speakers

Methods of Instruction	Presentations

Out of Class Assignments

- Research projects (e.g. design, build, and implement a TCP/IP based LAN on paper showing all technical specifications and associated costs)
- NetLab - troubleshooting network issues
- NetLab - switch and router configuration
- NetLab - creating a new network

Methods of Evaluation	Rationale
Exam/Quiz/Test	Final Examination
Exam/Quiz/Test	Quizzes
Project/Portfolio	Hands on projects
Exam/Quiz/Test	Midterm Examination
Project/Portfolio	Labs Completion

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Meyers, Mike	CompTIA Network+ Certification All-in-One Exam Guide, Seventh Edition (Exam N10-008)	McGraw-Hill	2022	978-1264269051

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Apply the OSI networking model to a TCP/IP network.

Configure all TCP/IP network nodes.

Use common network tools to create a physical working network.

Use network testing tools to identify and correct common network issues.

Select the appropriate equipment for a network installation.

SLOs

| Utilize the OSI networking model to troubleshoot common network issues. | Expected Outcome Performance: 70.0 |

ILOs
Core
ILOs
Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

| Explain the Transmission Control Protocol and Internet Protocol addressing systems. | Expected Outcome Performance: 70.0 |

ILOs
Core
ILOs
Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.

| Develop a network, test a network, and troubleshoot network. | Expected Outcome Performance: 70.0 |

ILOs
Core
ILOs
Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.

Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?
No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Network Models (3 hours)
- The Open Society Institute (OSI) Model
- Transmission Control Protocol/ Internet Protocol (TCP/IP) Model

Cabling and Topology (3 hours)
- Network topologies
- Cabling and connector
- Networking industry standards

Ethernet Basics (3 hours)
- Ethernet
- Early Ethernet networks
- Extending and enhancing ethernet network

Modern Ethernet (3 hours)
- 100 megabit ethernet
- Gigabit Ethernet
- Ethernet evolutions

Installing a Physical Network (1.5 hours)
- Understanding structured cabling
- Installing structured cabling
- Network Interface Cards (NIC)
- Diagnostics and repair of physical cabling

TCP/IP, Applications, and Security (3 hours)
- Standardizing network technology
- TCP/IP Protocol Suite
- CIDR and subnetting
- IP address assignment
- Port numbers
- TCP/IP applications
- Making TCP/IP secure
- TCP/IP secure standards and applications

Routing (1.5 hours)
- How routers work
- Dynamic routing

Network Naming (3 hours)
- Domain Name Systems (DNS)
- DNS servers
- Troubleshooting DNS

Advanced Networking (3 hours)
- Client-server and Peer-to-Peer topologies
- Virtual Private Networks (VPN)
- Switch management
- Virtual LAN's
- Multilayer switches

IPv6 (1.5 hours)
- Basics

- Using IPv6
- Moving to IPv6

Remote Connectivity (3 hours)
- Using remote access
- WAN troubleshooting

Wireless Networking (1.5 hours)
- Wi-Fi standards
- Implementing Wi-Fi
- Troubleshooting Wi-Fi

Virtualization and Cloud Computing (1.5 hours)
- What is virtualization and why do we virtualize
- Virtualization in modern networks
- Cloud

Building a Real-World Network (1.5 hours)
- Designing a network
- Unified communications
- Internet Connection Sharing (ICS)

Risk Management (3 hours)
- Security policies
- Change management
- Patching and updates
- Training
- Points of failure
- Security preparedness

Total Hours: 36

Laboratory/Studio Content

Cabling and Topology (10 hours)
- Network topologies
- Cabling and connector
- Networking industry standards
- Ethernet Basics
- Ethernet
- Early Ethernet networks
- Extending and enhancing ethernet network

Installing a Physical Network (10 hours)
- Understanding structured cabling
- Installing structured cabling
- Network Interface Cards (NIC)
- Diagnostics and repair of physical cabling

TCP/IP, Applications, and Security (1.5 hours)
- Standardizing network technology
- TCP/IP Protocol Suite
- CIDR and subnetting
- IP address assignment
- Port numbers
- TCP/IP applications
- Making TCP/IP secure
- TCP/IP secure standards and applications

Routing (1.5 hours)
- How routers work
- Dynamic routing

Network Naming (2.5 hours)
- Domain Name Systems (DNS)
- DNS servers
- Troubleshooting DNS

Advanced Networking (5 hours)
- Client-server and Peer-to-Peer topologies
- Virtual Private Networks (VPN)

- Switch management
- Virtual LAN's
- Multilayer switches

IPv6 (2.5 hours)
- Basics
- Using IPv6
- Moving to IPv6

Remote Connectivity (1 hour)
- Using remote access
- WAN troubleshooting

Wireless Networking (10 hours)
- Wi-Fi standards
- Implementing Wi-Fi
- Troubleshooting Wi-Fi

Building a Real-World Network (10 hours)
- Designing a network
- Unified communications
- Internet Connection Sharing (ICS)

Total Hours: 54