

Hesston College
BuCS 126 – Networking Technologies
Fall 2019

MISSION STATEMENT

Hesston College, a college of Mennonite Church USA, educates and nurtures each student within Christ-centered community, integrating thought, life, and faith for service to others in the church and the world.

COURSE INFORMATION

Faculty: Bob Harder
Office: K102 (Kropf Center)
Office Hours: MWF 10/2 TT 1/2
Telephone: 620.327.8322
Email: bobh@hesston.edu
Class Times: MWF 1:00-1:50pm
Credit Hours: 3 credits
Classroom: K130 CIT Computer Lab (Kropf Center)

REQUIRED TEXTBOOKS/INSTRUCTIONAL RESOURCES

No textbook. This class is hands-on and students generate their own "textbook".
A looseleaf notebook is useful for organizing course handouts, notes, and generated materials.

CATALOG DESCRIPTION

BuCS 126 Networking Technologies covers basic data communications and networking concepts including network models, protocols, operating systems, cabling and hardware, IP addressing and subnetting, switching and routing, wireless technologies, networking services, network administration and troubleshooting procedures. Prerequisite: none.

HESSTON COLLEGE OUTCOMES ADDRESSED IN THIS COURSE

1. Persons with intellectual and practical skills
c – media and information literacy
3. Persons of individual and social responsibility
b – moral and ethical reasoning, decision-making and action
5. Persons able to integrate and apply learning
a – critical and creative thinking and problem solving, utilizing inquiry and analysis

COURSE STUDENT LEARNING OUTCOMES

1. Define computer networking terms.
2. Apply basic computer networking concepts and principles.
3. Design and create a peer-to-peer and a client/server computer network.
4. Solve computer network troubleshooting issues.
5. Analyze, diagram and record information related to computer networks.
6. Demonstrate an awareness of legal and ethical issues related to computer networking.

COURSE ASSESSMENTS

<u>Hesston College Outcome</u>	<u>Course Outcomes</u>	<u>Assessment Activity</u>
1c	1	Research Assignment 1
1c	1	Research Assignment 2
1c	1	Network cable
1c	1,2,4	Quiz 1
1c	1	Research Assignment 3
1c	1	Punchdown
1c	1	Research Assignment 4
1c	1	Hub Network
1c	1,2,4	Quiz 2
1c	1	Research Assignment 5

<u>Hesston College Outcome</u>	<u>Course Outcomes</u>	<u>Assessment Activity</u>
1c	1	Research Assignment 6
1c	1	TCP/IP Worksheet
1c	1,2,4	Midterm
1c	1	Subnet Worksheet
1c	1	Research Assignment 7
1c	1	Research Assignment 8
1c	1	Quiz 3
3b	6	Opinion Paper
1c,5a	2,3,4,5	Project 1
1c,5a	2,3,4,5	Project 2
1c,5a	2,3,4,5	Final Exam

EVALUATION POLICY

Research Assignments and Tasks	40%
Midterm and Quizzes	20%
Paper	10%
Professionalism	10%
Final Exam	20%

GRADING SCALE

100 – 90%	A
89 – 80%	B
79 – 70%	C
69 – 60%	D
less than 60%	NC

Late assignments will not be accepted unless approved in advance. All non-group assignments are to be completed individually. Midterm grades will be evaluated based on the current class grade.

Professionalism is a vital trait in the business community. All Computer Science/Computer Information Technology students are assumed to be professionals and will start with 100 points (10% of the final grade). A first instance of unprofessional behavior will result in a verbal warning. A second instance will result in a written warning and the loss of the 100 professionalism points. The class instructor has the option of returning some or all of the professionalism points if consistent professional behavior is subsequently exhibited.

ATTENDANCE POLICY

Students are excused for college-approved group activities such as scheduled games for athletic teams, scheduled music and drama programs and trips, Student Life RA retreats, and academic activities including professional conferences and field trips. Students are not excused for practice in any sport; for music or drama rehearsals; or for service activities not part of a class-organized experience for credit. Doing so would count as an unexcused absence.

Students are responsible for class work regardless of the type of absence and should normally complete missed work in the week following the absence. Students are responsible to initiate contact with each instructor whose class the students will miss or have missed. For planned absences, this should occur in the week prior to the absence. For absences due to college-approved group activities, students must complete and submit all assignments on or before the due dates for all classes that will be missed.

Attendance will be taken at the beginning of each class period. After one absence week, each additional absence week not approved in advance may result in a one-letter grade reduction. Unless approved in advance, two late arrivals will count as one absence for grading purposes. As per Hesston College policy, students missing 20% or more of the scheduled meetings of a course, regardless of the number of excused/unexcused absences, may be subject to administrative course withdrawal. The Hesston College Vice President of Academics, and the college's Student Support Team all have weekly knowledge of your class attendance records.

STUDENTS WITH DISABILITIES

Students who have qualified disabilities covered through the Americans with Disabilities Act and who desire special assistance should contact Kristin Kaufman (x8213), Disability Coordinator, for assistance at the earliest possible time. While the coordinator will contact the instructor concerning requests for

assistance, the instructor would appreciate if you would notify him/her that you have made a request for assistance, so that your needs may be accommodated.

STATEMENT ON ACADEMIC DISHONESTY AND PLAGARISM

Academic dishonesty, including plagiarism and cheating, will not be tolerated. Students are responsible for knowing what constitutes these offenses and must not engage in them in their work. Any student committing such offenses will be referred to the Student Success Coordinator and reported to the Vice President of Academics. Penalties for such activities include: a zero for the assignment (first offense), an NC for the course to dismissal from Hesston College for subsequent offenses. For further information regarding this policy, refer to the *Hesston College Course Catalog*.

STATEMENT ON CONFIDENTIALITY AND MANDATORY REPORTING

As a professor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a professor. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep information you share private to the greatest extent possible. However, I am required to share with the Title IX coordinator information regarding sexual misconduct or information about an incident that may have occurred while at Hesston College. Students may speak to someone confidentially by contacting our non-mandatory reporters: *Campus Counselor* and *Campus Pastor*. Information on keeping our campus safe can be found on the *Hesston College website*.

CLASSROOM EXPECTATIONS

Texting, Internet browsing, messaging, emailing, or gaming during class is inappropriate and unprofessional. Your behavior becomes part of your final grade.

OTHER COURSE REQUIREMENTS AND INFORMATION

Before each class, students are expected to:

1. Check the course schedule for assignment due dates.
2. Go over the assigned reading from the text.
3. Complete assignments and homework by the due date.
4. Notify your instructor in advance if you can't attend or will be late. Otherwise, be on time.

The ACCESS lab (x8213) is located in the library and is available for study and learning support. Tutors are available to you at no charge. Contact your instructor if you would like to use this excellent service.

Prepare yourself to invest an average of 6 hours per week in additional study. The following table shows the approximate time by week you should expect to spend on various classroom activities:

Total study time estimate for this class: 91 hours

Total	Week	Notes	Research	Review	Task	Project	Paper
4.0	1	3.0	1.0				
6.0	2	3.0	1.0	1.0	1.0		
6.0	3	2.0	2.0	1.0	1.0		
6.0	4	2.0	2.0	1.0	1.0		
6.0	5	3.0	3.0				
4.0	6	2.0	2.0				
6.0	7	3.0		2.0	1.0		
5.0	8	3.0			2.0		
5.0	9	2.0	2.0		1.0		
4.0	10	2.0	1.0	1.0			
5.0	11	2.0				3.0	
8.0	12	3.0				3.0	2.0
8.0	13	3.0				3.0	2.0
5.0	14	2.0				3.0	
7.0	15	3.0		4.0			
6.0	16	2.0		4.0			

DISCLAIMER

The dynamics of the course or a change in certification may necessitate a change in the syllabus or schedule at the discretion of the instructor.

COURSE OUTLINE/CALENDAR

- 1 – Aug 19* Course introduction to syllabus, course outline, MSDNAA, CIT Computer Lab
Creation of user accounts, documentation
Network communications introduction
TCP/IP addresses
Static and dynamic TCP/IP computer configuration
Connectivity testing (PING)
Notes Assignment: Review, research and organize classroom notes
Research Assignment 1: OSI Reference Model
- 2 – Aug 26* DNS/DHCP introduction
OSI Reference Model introduction
OSI Physical layer
Cable topologies (bus, star, ring, mesh)
Cable types and connectors
Fiber optic cabling
External/internal cable installations
Straight-thru and crossover cable wiring
Notes Assignment: Review, research and organize classroom notes
Research Assignment 2: EIA/TIA 568B straight-through/crossover wiring
Task: Network Cable
Review for Quiz 1 (through OSI Reference Model introduction)
- 3 – Sep 2* **Quiz 1** (through OSI Reference Model introduction)
Straight-thru cable creation
Cable testing
Crossover cable creation
Punchdown
Two-computer networking with crossover cable
Connection troubleshooting
Notes Assignment: Review, research and organize classroom notes
Research Assignment 3: Types of Ethernet
Task: Punchdown
Review for Quiz 2 (cables and connectors)
- 4 – Sep 9* Network Interface Cards (NIC)
NIC card installation
OSI Data-Link layer protocols / transmission speed
Hub (Ethernet) computer network
Network troubleshooting
Ethernet standards (including Ethernet frame)
Notes Assignment: Review, research and organize classroom notes
Research Assignment 4: Windows Servers
Task: Hub Network
Review for Quiz 2 (cables and connectors)
- 5 – Sep 16* **Quiz 2** (cables and connectors)
Token Ring and FDDI
Collisions and broadcasts
Switching, Bridging, Routing, VLAN
Operating Systems history
OSI Network layer
TCP/IP addressing, DHCP and Workgroup networking review
Notes Assignment: Review, research and organize classroom notes
Research Assignment 5: TCP/IP Addressing

- 6 – Sep 23* Public file sharing
Printer configuration
Printer sharing
Network Monitor installation
Network troubleshooting
Windows Update
Notes Assignment: Review, research and organize classroom notes
Research Assignment 6: Internet Protocol (IP) datagram
- 7 – Sep 30* binary/octal/hex numbering systems
IP address classes
Internet Protocol (IP)
IP datagrams
Address Resolution Protocol (ARP)
Using Network Monitor to capture / analyze frames and datagrams
Full-octet subnetting
Notes Assignment: Review, research and organize classroom notes
Review for Midterm
Task: TCP/IP Addressing
- 8 – Oct 7* Partial-octet subnetting
Routing and Remote Access (RRAS) Routing Lab
Midterm – Wed, Oct 11
Notes Assignment: Review, research and organize classroom notes
Task: Subnetting Worksheet
- Oct 14-15* **Fall Break** (class resumes Wed, Oct 16)
- 9 – Oct 16* Routing Lab (continued)
Routing Information Protocol (RIP)
NTFS permissions
Notes Assignment: Review, research and organize classroom notes
Research Assignment 7: NTFS permissions
Task: Subnetting Worksheet
- 10 – Oct 21* Share permissions
Groups
Active Directory introduction
Active Directory installation
OSI Transport layer
Ports and sockets
Transmission Control Protocol (TCP)
Notes Assignment: Review, research and organize classroom notes
Research Assignment 8: Well-known ports / network protocols
Review for Quiz 3 (network protocols)

- 11 – Oct 28* **Quiz 3** (network protocols)
 User Datagram Protocol (UDP)
 OSI Session, Presentation, Application Layers
 Using Network Monitor to capture / analyze UDP and TCP datagrams
 Active Directory organization and planning
 Security groups
 User profiles
 File and folder attributes
 Compression
 Encryption
 Distributed File System (DFS)
Notes Assignment: Review, research and organize classroom notes
Project 1
- 12 – Nov 4* Disk partitioning
 Disk quota management
 Network file system security
 Logon scripts
 Network drives
Notes Assignment: Review, research and organize classroom notes
Project 1 and Documentation
Opinion Paper
- 13 – Nov 11* Group Policy Management
 Default Domain Policy
 User security policies (account policies, account lockout policies, user rights assignments)
 Audit policies (user account control, file system)
 Disk storage (partitions, basic/dynamic disk, fault tolerance, Storage Area Network)
 Disk storage (defragmentation, disk check)
 Backup
Notes Assignment: Review, research and organize classroom notes
Project 2
Opinion Paper
- 14 – Nov 18* Domain Name System (DNS)
 DNS installation, configuration and troubleshooting
Notes Assignment: Review, research and organize classroom notes
- 15 – Nov 25* Dynamic Host Configuration Protocol (DHCP)
 DHCP installation, configuration and troubleshooting
 Internet Information Services (IIS)
 IIS installation and configuration (http)
 IIS secure server configuration (https)
 Server certificates
Notes Assignment: Review, research and organize classroom notes
Final Exam practice
- Nov 27-29* **Thanksgiving** (no class Wednesday or Friday)
- 16 – Dec 2* Wireless networking
 Special topics
Final Exam practice
- Dec 9 (Mon) Reading Day (no class)
 Dec 11 (Wed) **Final Exam 1:00-2:50pm**