



## CSCI 444.01W

### Networking II Routers and Switches

SPRING 2024

#### INSTRUCTOR INFORMATION

**Instructor:** S. Saffer, Ph.D.

**Office Location:** JOUR 235

**Office Hours:** Communication by email is welcome at any time, including evenings and weekends. Face to face conferences via Zoom are available on request.

**Office Phone:**

**Office Fax:**

**University Email Address:** sam.saffer@tamuc.edu

**Preferred Form of Communication:** email

**Communication Response Time:** Response to Emails should be no more and 24 hours.

#### COURSE INFORMATION

##### Materials – Textbooks, Readings, Supplementary Readings

**Textbook(s) Required:** Materials for the major topics for this course are presented in Class Notes, which will be provided to students free of charge.

**Software Required:** Cisco Simulator Packet Tracer. This software is available to the student free of charge from Cisco.

**Optional Texts and/or Materials:** Supplemental Textbooks: On reserve in the Library for extra reading:

IP Switching and Routing Essentials. Stephen A. Thomas. John Wiley & Sons, Inc. New York. March 2001.

Data Communications, Computer Networks, and Open Systems. Fred Halsall. Addison-Wesley, Menlo Park, Calif.

Cisco Certified Network Associate Study Guide 4th Ed. by Todd Lammie. Sybex.

*The syllabus/schedule are subject to change.*

Computer Networks. Andrew Tanenbaum, David Wetherall (International Economy Edition) 2010.

## **Course Description**

This course is a continuation of CSCI 434 (Networking I Local Area Networks). This course instructs students in the detailed operation and configuration of network routers and data switches. Also, such common network security techniques as Virtual Local Area Networks (VLANs) and Access Control Lists (ACLs) will be presented along with other network security topics. Students will have the opportunity to work with routers and switches in the laboratory using a network simulator, as they learn how these devices are configured and used in network design and implementation. Prerequisites CSCI 434.

### **Student Learning Outcomes**

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- 1) Students will be able to design, and to configure a router network with IP Addresses and Routing protocols.
- 2) Students will be able to design and configure a switched network and VLANs.
- 3) Students will be able to utilize Access Control Lists (ACLs) in configuring security for routers.
- 4) Students will be introduced to Wide Area Networks and WAN components, and be able to integrate the knowledge of subnets, routers, switches, VLANs, ACLs and WANs, into an understanding of modern digital computer networks.
- 5) Students will gain practical laboratory experience working with routers and switches using a network simulator.

## **COURSE REQUIREMENTS**

### **Minimal Technical Skills Needed**

**Students will use Microsoft Windows 10 Operating System. Students are expected to be familiar with MyLeo Online (D2L Brightspace).**

### **Instructional Methods**

**Instructional methods include lectures and exercises, and programming assignments, which are documented in the class notes. Class notes and video lectures are included in MyLeo Online (D2L Brightspace). Students are expected to complete exercises and take practice exams, which are designed to help students determine which materials need further review. The educational process is further enhanced by the assembly language programming assignments.**

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## **Student Responsibilities or Tips for Success in the Course**

**Student should attend lectures and review lectures which are included in myLeo Online (D2L Brightspace). Students should also work all assigned exercises and complete all programming assignments.**

### **GRADING**

Grade Calculation:

Test #1    20%            Test #2    20%            Test #3    20%  
Lab Grade 10%    Final Exam 30%

Class attendance is required. Five points will be deducted from the final grade average for each unexcused absence from class. If you have 4 or more unexcused absences, you may be dropped from the course with a (DF) Drop Fail. To get full credit for Labs, you must attend all 4 labs. Please inform me of any circumstances which may prevent you from attending class. The claim of illness must be accompanied with a Doctor's written note and will be reviewed by the Assistant Dean. (See Student Handbook).

### **Assessments**

Student Learning Outcome #1 – assessed by Test#1  
Student Learning Outcome #2 – assessed by Test#2  
Student Learning Outcome #3 – assessed by Test#3  
Student Learning Outcome #4 – assessed by Final Exam  
Student Learning Outcome #5 – assessed by the Lab work  
An Average of Test#1, Test#2, Test#3, is 60% of the final grade.  
The Final Exam is 30% of the final grade.  
Lab work is 10% of the final grade.

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## **TECHNOLOGY REQUIREMENTS**

### **LMS**

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

[https://documentation.brightspace.com/EN/brightspace/requirements/all/browser\\_support.htm](https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm)

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Zoom Video Conferencing Tool

[https://inside.tamuc.edu/campuslife/CampusServices/CITESupportCenter/Zoom\\_Account.aspx?source=universalmenu](https://inside.tamuc.edu/campuslife/CampusServices/CITESupportCenter/Zoom_Account.aspx?source=universalmenu)

## **ACCESS AND NAVIGATION**

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

**Note:** Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

## **COMMUNICATION AND SUPPORT**

If you have any questions or are having difficulties with the course material, please contact your Instructor.

### **Technical Support**

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

### **Interaction with Instructor Statement**

## **COURSE AND UNIVERSITY PROCEDURES/POLICIES**

### **Course Specific Procedures/Policies**

#### **Syllabus Change Policy**

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

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## **University Specific Procedures**

### **Student Conduct**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

<https://www.britannica.com/topic/netiquette>

### **TAMUC Attendance**

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedures 13.99.99.R0.01](#)

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

### **Academic Integrity**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

[Undergraduate Student Academic Dishonesty Form](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf>

[Graduate Student Academic Dishonesty Form](#)

<http://www.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyFormold.pdf>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

### **Students with Disabilities-- ADA Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a

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learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

### **Office of Student Disability Resources and Services**

Texas A&M University-Commerce

Velma K. Waters Library Rm 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: [studentdisabilityservices@tamuc.edu](mailto:studentdisabilityservices@tamuc.edu)

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

### **Nondiscrimination Notice**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

### **Campus Concealed Carry Statement**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

### **A&M-Commerce Supports Students' Mental Health**

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to

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community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit [www.tamuc.edu/counsel](http://www.tamuc.edu/counsel)

### **AI use policy [Draft 2, May 25, 2023]**

**Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.**

**Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).**

**Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.**

**In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.**

**13.99.99.R0.03 Undergraduate Academic Dishonesty**

**13.99.99.R0.10 Graduate Student Academic Dishonesty**

**Department or Accrediting Agency Required Content**

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# **COURSE OUTLINE / CALENDAR**

CSCI 444 SPRING 2024

## **WEEK 1 JANUARY 10 - JANUARY 12**

Course Overview: Review IEEE 802.3 and IEEE 802.5  
Review LAN comparison: Routers and Switches enhanced Ethernet

## **WEEK 2 JANUARY 15 - JANUARY 19**

Review subnetting;

## **WEEK 3 JANUARY 22 - JANUARY 26**

Review: Classful/Classless IP subnetting; CIDR; VLSM

## **WEEK 4 JANUARY 29 - FEBRUARY 2**

Configuring the Cisco Router  
Cabling considerations

## **WEEK 5 FEBRUARY 5 - FEBRUARY 9**

LAB #1: Configuration of the Cisco Series 2500 Router

## **WEEK 6 FEBRUARY 12 - FEBRUARY 16**

More on Router Configuration

## **WEEK 7 FEBRUARY 19 - FEBRUARY 23**

Routing protocols, routed protocols, Distance-vector protocols, Link -State Protocols

## **WEEK 8 FEBRUARY 26 - MARCH 1**

EXAM #1 - Routing Protocols; Router Configuration

## **WEEK 9 MARCH 4 - MARCH 8**

Introduction to communications switches  
How to configure a switch; Spanning Tree Protocols and associated terms

## **WEEK 10 MARCH 11 - MARCH 15 SPRING BREAK**

## **WEEK 11 MARCH 18 - MARCH 22**

Virtual Local Area Networks (VLANs)  
Configuration of Switches; Configuration of VLANs

## **WEEK 12 MARCH 25 - MARCH 29**

EXAM #2 - Switches, VLANs

## **WEEK 13 APRIL 1 - APRIL 5**

Standard and Extended Access Control Lists ACLs

## **WEEK 14 APRIL 8 - APRIL 12**

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LAB#4: Exercises - ACL's

**WEEK 15 APRIL 15 - APRIL 19**

EXAM#3 ACLs

**WEEK 16 APRIL 22 - APRIL 26**

Wide Area Networks (WANs);

**WEEK 17 APRIL 29 - MAY 3**

Course review

**WEEK 18 MAY 6 - MAY 10**

**FINAL EXAM**

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