## MIS 341 Data Communications and Computer Networks

University of Massachusetts Dartmouth

Charlton College of Business and Industry

Department of Decision and Information Sciences

**Class** MIS 341-01

**Time:**  TuTh 12:30PM - 1:45PM

Instructor: Zhengzhong Shi, Ph.D.

Prerequisite(s): MIS 315 (Information Systems), Junior Standing

Office: Charlton College of Business, Room 209

Email: [zshi@umassd.edu](mailto:zshi@umassd.edu)

**Course Web Site:** <https://my.umassd.edu/>

**Office Phone:** 508-9106513 (Email is preferred)

**Office Hours:** Tuesday, Thursday, 2:00pm - 3:15pm;

Wednesday: Zoom Session: 2:00pm - 3:30pm

**Time and Classroom:**

Tu 3:30PM - 4:45PM Science & Engr 109

Th 3:30PM - 4:45PM CCB-341

## Textbook

Computer Networking: A Top-Down Approach (7th Edition) Pearson, 2016

## Course Objectives

In a world in which computer networks are involved in nearly every facet of business and personal life, it is paramount that each of us understands the basic features, operations, and limitation of different types of computer networks. This course should give you a strong foundation in computer networks, which will enable you to work effectively with network administrators, network installers, and network designers.

## Grading Criteria

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| --- | --- |
| **Evaluation Activities** | **Percentages** |
| Exam | 20% |
| Project | 15% |
| Assignments/Labs/Report | 60% |
| **Attendance** | **5%** |
| **Total** | **100%** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Score** | **Final Grade** | **Score** | **Final Grade** |
| 94% and Up | A | 73%-76.9% | C |
| 90%-93.9% | A- | 70%-72.9% | C- |
| 87% - 89.9% | B+ | 67% - 69.9% | D+ |
| 83%-86.9% | B | 63%-66.9% | D |
| 80%-82.9% | B- | 60%-62.9% | D- |
| 77% - 79.9% | C+ | Less than 60% | F |

**2024 Spring Academic Calendar**

Monday, January 22, 2024 First Day of Classes

Monday, January 29, 2024 Last day to Add, Drop, or Audit

Monday, February 19, 2024 Presidents' Day Holiday: no classes

Tuesday, February 20, 2024 Follow Monday's class schedule

Tuesday, February 27, 2024 Last day to file Pass/Fail

Monday, March 11, 2024 Spring recess begins

Monday, March 18, 2024 Classes resume

Monday, April 1, 2024 Registration for Fall 2024 begins

Friday, April 12, 2024 Last day to Withdraw from a class

Monday, April 15, 2024 Patriots' Day Holiday: no classes

Tuesday, April 30, 2024 Last day of Spring classes

## Tentative Schedule

|  |  |  |
| --- | --- | --- |
| **Week /Date** | | **Chapters** |
| 1 | Jan 23, 25 | Chapter 1: Computer Networks and Internet (Parts1 and 2) |
| 2 | Jan 30, Feb. 1 | Chapter 1: Computer Networks and Internet (Parts 3, 4, 5)  Lab |
| 3 | Feb. 6, 8 | Chapter 2: Application Layer (Parts1 and 2)  Lab |
| 4 | Feb. 13, 15 | Chapter 2: Application Layer (Part 3)  Lab |
| 5 | Feb. 20, 22 | Feb. 20: Follow Monday's class schedule  Chapter 2: Application Layer (Parts 1 and 2) |
| 6 | Feb. 27, 29 | Chapter 2: Application Layer (Part 3)  Lab |
| 7 | Mar. 5, 7 | Chapter 3: Transport Layer (Part 1 and 2) |
| 8 | Mar. 12, 14 | Spring Break  No Class |
| 9 | Mar. 19, 21 | Chapter 4: Network Layer I  Lab  **Project Proposal Due on Mar. 19** |
| 10 | Mar. 26, 28 | Chapter 5: Network Layer II – Part 1  Lab |
| 11 | April 2, 4 | Chapter 5: Network Layer II – Part 2  Lab |
| 12 | April. 9, 11 | Chapter 6: Link Layer  Lab |
| 13 | April 16, 18 | Lab  Exam (Chapters 1, 2, 3, 4, 5, 6) |
| 14 | April 23, 25 | Project Presentation – 1Project Presentation – 2 |
| 15 | April 30 | Project Presentation - 3  (April 30, last class)  Project Report/PPT Due May 1 |

**Note: We may add more materials if time is available.**

## Access Packet Tracer:

*Method 1: install packet tracer on your computer*

*Please signup, login and download the right version for your computer.*

<https://www.netacad.com/courses/packet-tracer-download/>

You need to sign up with cisco first: [Log In to Cisco](https://id.cisco.com/), <https://id.cisco.com/>.

Method 2: You have the choice to virtual lab to access Software as needed. Here is the link: corsairdesktop.umassd.edu (PT will be installed by CITS soon). *Use your email username and password to login. Select CCB lab, and login the virtual computer. And find packet tracer in the main menu.*

Graphical user interface, application

Description automatically generated

## Labs and Assignments:

|  |
| --- |
| Lab 1: DHCP |
| Lab 2: DHCP with Commands |
| Lab 3: DNS and Email |
| Lab 4: NAT Lab |
| Lab 5: Multi-Point GRE |
| Lab 6: IPv6-IPv4-IPv6 |
| Lab 7: OSPF Lab |
| Lab 8: BGP Lab |
| Lab 9: VLAN Lab |

Note: More labs may be added depending on the progress of the class.

## COURSE PROJECT

### Type 1: Working with an Organization

Each team (or an individual student) should identify a university (such as our university’s CITS), or a hospital, or a manufacturing company, etc. and investigate its computer network designs.

A student team needs to find out the organizational network design (LAN and WAN structure and various servers), identify the characteristics of important products and services used (such as routers, Internet Service provider, switch, cables, etc.), and evaluate whether the network capacity can meet the current and future requirements of business strategy. What kind of improvements should the firm make to meet its strategic goals?

Student teams should set up interview schedules to talk with network and IS managers and users in the identified company. Teams should also try to gather documents and search the library and Internet to find necessary materials and information for data analysis. A presentation and report are required to get the grade at the end of the semester.

#### Project Proposal Required Items

1. The firm your team would like to focus on
2. The network system you would like to investigate
3. The meeting schedule for the team
4. The interview schedule with company managers
5. The responsibilities and email address for each team member (such as project coordinator, report writing, data collection, library and web research, etc.)

#### Project Report (With Presentation Video Uploaded into your Youtube channel for the online class)

1. Firm background
2. Description of the network design
3. Description of the products and services used in the network
4. User satisfaction/feedback/comments about the current systems
5. Recommendations for improvement of the system
6. Interview transcripts and documents should be attached.

#### Project Grading Criteria (Rubrics)

|  |  |
| --- | --- |
| **Criteria (Weights)** | **Evaluation Items** |
| A Brief Firm background introduction (5%) | Firm history, products and services, size, revenue |
| Description of the Network Design (25%)—**Emphasized** | LAN and WAN design pictures and explanations |
| Description of the products and services used in the network (15%)- **Emphasized** | Brand, capacities, important features of the product and services, service fee schedule, competing products and services, rationale for the selection of the particular product and services |
| User satisfaction/feedback/comments about the current systems (15% - **Emphasized** | Interview, survey, and documents can be used to gather feedback from users and some statistics can be used to evaluate user feedback and comments. |
| Recommendations for improvement of the system. (10%) | Rationale for changes should be clarified and new products or services may need to be specified. |
| Presentation Quality: Smooth and logical. (Presentation slides should be handed in right after your presentation.) (30%) | Team members know what they should talk about and there are smooth transitions from one member to another member. Presentation topics have intrinsic logic and all the relevant materials are well arranged and presented. **Please do not just read your slides.** |

#### Note:

0. Very poor: it means that your team does a very poor job in introducing and explaining the topic.

3. Average: it means that your team does an average job in introducing and explaining the topic.

5. Excellent: it means that your team does an excellent job in introducing and explaining the topic.

An excellent project should show your efforts in identifying the firm and the system, collecting and analyzing the data, presenting your project logically and smoothly, organizing your report in a logical manner, and submitting your report timely.

### Type 2: Research a Networking Technology

For this type of project, you do not need to work with a company. You need to identify a topic that you are interested in and then do research with it through watching youtube videos, reading relevant books (e.g., chapters in our textbook or other textbooks), and internet search through google. A few example networking technologies you may do some research could be 1) wide area network such as MPLS and Frame relay, 2) DMVPN (dynamic multipoint virtual private network), 3), IPSec, 4) Networking in Data Centers, 5) deep dive into routing protocols (OSPF and BGP) beyond class discussions. You may use Arista’s vEOS/cEOS to explore MPLS, DMVPN, or BGP or other technologies that are not supported by packet tracer.

#### Project Proposal Required Items

1. The technology your team would like to focus on
2. A general plan about different features of the chosen technology you would like to investigate.
3. Sources of materials you would like to work with
4. The responsibilities and email address for each team member (such as project coordinator, report writing, research, etc.)

#### Project Report (With Presentation Video Uploaded into your Youtube channel for the online class)

1. Overall description of the network technology
2. Example products (from cisco or other vendors) that implement the technology
3. Technology demonstration with a working topology in Cisco Packet Tracer or with Arista’s vEOS/cEOS and GNS3.
4. Key challenges in using the technology
5. Key learning from the research

#### Project Grading Criteria (Rubrics)

|  |  |
| --- | --- |
| **Criteria (Weights)** | **Evaluation Items** |
| Features of the Technology and Use of the Technology  (20%)—**Emphasized** | Clear descriptions of the features with examples of use of the technology. |
| Example Products/Services from Vendors  (10%) | Brand, capacities, important features of the product and services, service fee schedule, competing products and services, etc. |
| Technology Demonstration in Packet Tracer (30% - **Emphasized** | The topology in Packet Tracer should work well. |
| Key learning and challenges (10%) | Barriers and obstacles in the research process |
| Presentation Quality: Smooth and logical. (Presentation slides should be handed in right after your presentation.) (30%) - **Emphasized** | Team members know what they should talk about and there are smooth transitions from one member to another member. Presentation topics have intrinsic logic and all the relevant materials are well arranged and presented. **Please do not just read your slides.** |

## Course Policies

1. **Course Materials: All materials will be posted on the Course web site.**
2. **Class Participation.** All students are encouraged to contribute to the success of the course by sharing their knowledge and opinions in class, including bringing pertinent materials and experience to the attention of the instructor and class. ***Students will also be frequently called to answer questions and discuss problems.***
3. **Assignments/Labs:** No late assignments/labs will be accepted. Exceptions will be made given extenuating circumstances such as a note from a doctor.
4. **Ethical Behavior.** MIS professionals must be trusted, because they may have access to a wide variety of confidential and personal information. ***Cheating will not be tolerated***. On exams, cheating consists of looking, just once, at another paper. People who cheat on an exam risk being failed in the course. Likewise, cheating will not be tolerated on homework or project work in the class.
5. **Changes in the Syllabus:** Any administrative decisions regarding matters arising that are not covered by the syllabus will be made on an “as-needed” basis. Students will be informed of any changes in as timely a manner as possible.
6. **Medical Needs:** If you have any special learning or testing requirements please let me know as soon as possible so special arrangement can be made. If you have any special medical condition (e.g., epilepsy) that you feel it would be helpful for me to know about, let me know. If you have any special needs in terms of evacuating the building in case of an emergency, let me know.
7. **Getting to Know the University**

Please visit the following web pages and read through the introduction.

1.         Academic Resource Center: http://www1.umassd.edu/arc/

2.         Career Development Center: http://www.umassd.edu/cdc/

3.         Writing Center: http://www1.umassd.edu/arc/wrc/

4.         Academic Advising Center: http://www1.umassd.edu/acadvising/welcome.cfm

If you are interested in getting to know more about centers in this university, please visit http://www1.umassd.edu/campus/centers.cfm for more information about centers in this University.

More University Policy Details at <https://www.umassd.edu/media/umassdartmouth/provost/omnibus_language_for_syllabi_-jan_11_2019.pdf>

## Policy on UMass Dartmouth Student Academic Integrity

All UMass Dartmouth students are expected to maintain high standards of academic integrity and scholarly practice. The University does not tolerate academic dishonesty of any variety, whether as a result of a failure to understand required academic and scholarly procedure, or as an act of intentional dishonesty. The instructor should state his/her policy if a student violates the University Academic Integrity Policy.

https://www.umassd.edu/media/umassdartmouth/university-policies/new-policies/policies-2019/ACA-017-Student-Academic-Policy-for-Undergraduates.pdf