**DEPARTMENT OF COMPUTER SCIENCE**

**SCHOOL OF ENGINEERING AND APPLIED SCIENCE**

**UNIVERSITY OF VIRGINIA**

**COURSE SYLLABUS**

**Course Title**: Computer Networks

**Course Number**: CS4457

**Credit Hours**: 3

**Instructor**:

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**Semester Offered**: Spring, 2016

**Course Description**:

What actually happens when you use a Web browser, send an email, or video conference with a friend?  This course goes behind the scenes to see how networks really work, from the user's application down to the physical bits on the wire.  It provides an introduction to fundamental concepts in networked systems and covers aspects of the current Internet architecture, network security, and emerging network technologies. Topics covered in the course are TCP/IP Protocol Suite (application layer, transport layer, network layer, data link layer, and physical layer), wireless networks, multimedia and QoS control, and network security.

**Prerequisites**: CS3330 or ECE3330 (Computer Architecture) with a grade of C- or higher

**Office Hours**: T, Th; 11:50 a.m. – 12:20 p.m.; 1:50 p.m. – 3:20 p.m.

**Rationale**:

Computer networking is a core piece of most systems being developed these days. Even if you go to work for a company that hosts its systems entirely on their own networks, understanding networking is a key skill to being a good engineer. Since the Internet is a computer network that millions of people use every day, this course will benefit you from understanding the design strategies used to solve computer networking problems while you learn how the Internet works.

**Intended Audience**:

The course is designed primarily as the first course in computer networks to be taken by those senior undergraduate students.

**Expected Student Outcomes**:

1. Describe what a computer network is and how it is designed and implemented.

2. Understand the major protocols in a computer network.

3. Understand how TCP/IP is designed and implemented.

4. Understand how various layers in TCP/IP suite is designed and implemented.

5. Understand how a wireless network is designed and implemented.

6. Understand how multimedia is handled and transmitted.

7. Understand how network security is enforced.

**Instructional Activities**:

The course is basically lecture/discussion oriented. You are required to complete a number of homework assignments, quizzes, two tests, and a final exam.

**Text Book (optional)**:

James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach, Pearson, 6th Edition, 2013.

**Topical Outline**:

**Week #** **Date** **Topics**

1 01/21 overview of the Internet

2 01/26 application layer

01/28 application layer

3 02/02 application layer

02/04 transport layer

4 02/09 transport layer

02/11 transport layer

5 02/16 transport layer

02/18 **Test 1**

6 02/23 network layer

02/25 network layer

7 03/01 network layer

03/03 network layer

8 03/08 **Spring Break**

03/10 **Spring Break**

9 03/15 data-link layer

03/17 data-link layer

10 03/22 data link layer

03/24 data-link layer

11 03/29 physical layer

03/31 **Test 2**

12 04/05 physical layer

04/07 physical layer

13 04/12 multimedia and QoS control

04/14 multimedia and QoS control

14 04/19 multimedia and QoS control

04/21 multimedia and QoS control

15 04/26 network security

04/28 network security

16 05/03 network security

05/05 network security

17 05/09 **Final Exam (9:00 – 12:00)**

**Evaluation**:

The criteria used to evaluate your performance consist of the following parts: (1) a number of homework assignments (60 points, 30%); (2) 9 quizzes (27 points, 15%); (3) two tests (30 points each, 30%); and (4) final exam (50 points, 25%).

Percentage is used to determine your grade. You simply add all the points you have received for assignments, quizzes, tests, and final exam and divide it by the total points. You then use the following scale to determine your letter grade any time, any place, using any device:

A+: 97.5% – 100.0%

A: 94.5% – 97.4%

A-: 90.0% – 94.4%

B+: 87.0% – 89.9%

B: 83.5% – 86.9%%

B-: 80.0% – 83.4%

C+: 77.0% – 79.9%

C: 73.5% – 76.9%%

C-: 70.0% – 73.4%

D+: 67.0% – 69.9%

D: 63.5% – 66.9%%

D-: 60.0% – 63.4%

F: below 60.0%

Note that "incomplete" is normally not granted unless the following two conditions are evidently met:

(1) You have made a substantial progress for the course. This normally means you have completed three fourths of the coursework and maintained a B or above.

(2) Something unexpected (out of your control) has happened that prevents you from completing the remaining coursework.

A quiz will be given in class each week on Tuesday, excluding those weeks for spring break, two tests, and the first two weeks. Each quiz will cover the material presented in the previous week. The first quiz will be given on 02/02. Each quiz will take 10 minutes and be given at the end of the lecture. Each quiz is worth 3 points. Quizzes of two lowest scores will be dropped.

Final exam is comprehensive containing all the materials covered for the semester.

Late submission of assignments is allowed up to 3 days from the due time/date. However, each day will cost you to lose 20% of the total points. Extension beyond 3 days is possible only if convincing evidence is provided.

Assignments can be generated using a word processor or by legible handwriting. They must be submitted **in class** on the due date. Late assignments must be submitted to collab. Late assignments found in my mailbox or slid under my office door are NOT acceptable.

All make-up quizzes and tests (with acceptable excuses) must be taken within a week from the test date. However, make-up final exam will not be given.

Regrade for assignments, quizzes, and tests must be done within a week from the time when results are posted on collab.

All assignments must still be submitted to collab even if classes are canceled on the due dates due to inclement weather.

**Honesty**:

Copying assignments from each other is considered cheating. Serious consequences will result if this happens. Discussion in a group, however, is welcome and encouraged.

Note that letting others copy your assignments will be handled in the same way as that shown above. So always keep your assignments in a safe and secure place.

In summary, university-wide honor system/policy is enforced here for the course and all materials submitted must contain an honor pledge.