

# COURSE SYLLABUS

## CS 453

### Data and Computer Communications – Revised 3/25/20

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#### Course Introduction

**Credit Hours:** 3

**Prerequisite Courses:** CS 350 with a C- or better

**Instructor:** Professor Brian D. Woerner

**Class Meets:** MWF 11-11:50am - AER 137 (meetings online after 3/30/20)

**Course Introduction:**

An in-depth study of the Internet, networking fundamentals, protocols, algorithms, and principles of distributed computing; introduction to networking security and management.

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#### Faculty Contact Information

**Instructor Office Location:** AER 254

**Online Office Hours:** TR 11am-12noon, MWF 2-3pm or by appointment

**Instructor Email and/or Phone:** email: brian.woerner@mail.wvu.edu phone: 304-293-9141

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#### Instructional Materials

**Required Instructional Materials:**

James Kurose and Keith Ross, Computer Networking: A Top-Down Approach, Pearson, 2017, ISBN-13: 978-0-13-359414-0

**Additional Course Materials:**

Additional course notes and video lecture materials will be available on e-campus website

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#### Course Learning Outcomes

**Course Learning Outcomes:**

Upon completion of this course, students will be able to:

1. Describe the operation of the TCP/IP protocol
2. Analyze the properties of network protocols [ABET outcome CpE/CS/CYBE (1) ]
3. Apply socket programming techniques to establish client-server communication [ABET outcome CS (6) ]
4. Describe the principles of mobility management in wireless networks

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## Assessment

### **Short Descriptions of and Grading Criteria for Major Assignments/Assessments:**

There will be 5 homeworks during the course of the semester. Some of these homeworks will involve simple programming using the Python programming language to illustrate the principles of socket programming for client-server communication. Other homeworks will make use of the Wireshark tool to analyze real-time packet traffic.

There will be 11 brief (5-7 minute) quizzes, based on information from the lecture. The lowest quiz grade will be dropped. The first 5 quizzes were taken in class. The last 6 quizzes will be taken online and are open book and notes. They may be taken at your own pace, but each will have a due date to encourage students to keep up with the materials

There will be a two mid-term exams and a final exam. The second mid-term and final will be taken online using the Respondus tool, and will be closed book and notes.

### **Weight/Distribution of Course Points:**

- 5 Homeworks (@8%): 40%
- 10 Quizzes (@ 1%): 10% (11 quizzes will be given, with the lowest grade dropped)
- 2 Mid-term Exams (@15%): 30%
- Final Exam: 20%

### **Mid-Semester Grade:**

Based on Homework 1 & 2, Quizzes 1-4, and first Mid-term exam

### **Final Grading Scale:**

Guaranteed grade cutoffs: A >90%, B >80%, C >70%, D >60%

The instructor reserves the right to lower these grade cutoffs to account for the difficulty of assignments and overall class performance.

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## Course and Institutional Policies

### **Attendance Policy:**

Class attendance is at your discretion but quizzes and homeworks will have due dates, so it is in your best interest to attend all classes

### **Late Assignment and Missed Exam Policy:**

Late homeworks will be accepted with a penalty for one week after the deadline. Late homeworks submitted longer than one week after the deadline will not be accepted. Exams missed to a valid reason or excused university event will be made up by individual appointment with the instructor.

**Inclusivity Policy:**

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with the Office of Accessibility Services. (<https://accessibilityservices.wvu.edu/>)

**Academic Integrity Policy:**

All work submitted for in-classes quizzes (pre-spring break) and exams must be your own unaided work, without the aid of notes, textbooks, online browsers, or smart devices.

All work submitted for online quizzes should be your own unaided work, but you may refer to course notes or online resources.

You may confer with colleagues on the general approach to homework policies, but the solutions you submit should be your own.

**Institutional Policies:**

Students are responsible for reviewing [policies](#) on inclusivity, academic integrity, incompletes, sale of course materials, sexual misconduct, adverse weather, as well as student evaluation of instruction, and days of special concern/religious holiday statements.

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## Tentative Outline of Lectures and Assignments

Week 1 (Jan. 13)

Chapter 1: Computer Networks & the Interview

Week 2 (Jan. 20)

Chapter 2: Application Layer

Quiz #1

Week 3 (Jan. 27)

Chapter 2: Application Layer

Homework #1 Assigned; Quiz #2

Week 4 (Feb 3)

Chapter 3: Application Layer;

Homework #1 Due

Week 5 (February 10)

Chapter 3: Transport Layer

Homework #2 Assigned; Quiz #3

Week 6 (February 17)

Chapter 3: Transport Layer

Homework #2 Due; Quiz #4  
 Week 7 (February 24)  
 Chapter 3: Transport Layer  
 Mid-Term Exam #1 (Friday, February 28)  
 Week 8 (March 2)  
 Chapter 4: The Network Layer- Data Plane  
 Quiz #5  
 Week 8 (March 9)  
 Chapter 4: The Network Layer – Data Plane  
 Homework #3 Assigned  
 Spring Break & Social Distancing begins (March 14-27)

**Class Schedule beginning March 30**

| Date   | Wkday | Topic                     | Section   | Book Pages  | Assignments Due        |
|--------|-------|---------------------------|-----------|-------------|------------------------|
| 30-Mar | Mon   | IP V6                     | 4.3       | pp. 345-353 |                        |
| 1-Apr  | Wed   | Routing Algorithms        | 5.1, 5.2  | pp. 373-376 | HW#3                   |
| 3-Apr  | Fri   | LS & DV algorithms        | 5.2       | pp. 379-390 | Review Quiz 6          |
| 6-Apr  | Mon   | OSPF                      | 5.3       | pp. 391-395 |                        |
| 8-Apr  | Wed   | BGP                       | 5.4       | pp. 395-407 | Review Quiz 6          |
| 10-Apr | Fri   | ICMP & Network Management | 5.6, 5.7  | pp. 419-426 |                        |
| 13-Apr | Mon   | Link Layer                | 6.1, 6.2  | pp. 439-450 | Review Quiz 8          |
| 15-Apr | Wed   | Multiple Access           | 6.3       | pp. 451-466 |                        |
| 17-Apr | Fri   | Midterm #2                |           |             | Midterm #2             |
| 20-Apr | Mon   | Ethernet                  | 6.4       | pp. 467-486 |                        |
| 22-Apr | Wed   | Web Page Requests         | 6.7       | pp. 500-506 | Review Quiz 9          |
| 24-Apr | Fri   | Wireless Physical Layer   | 7.1., 7.2 | pp. 519-531 |                        |
| 27-Apr | Mon   | Wi-Fi                     | 7.3       | pp. 532-550 | Review Quiz 10         |
| 29-Apr | Wed   | Celllar & PCS             | 7.4       | pp. 551-560 |                        |
| 1-May  | Fri   | Course Review             |           |             | Review Quiz 11 (bonus) |
| TBD    | TBD   | Final Exam                |           |             | Final Exam             |