Introduction to Computer Networks and Network Management
CSCI 446
— Spring 2017 —

General Information

Instructor
Dr. Hamouda, E.
Office
OCNL 228
Office Hours
M 12 PM – 1:00 PM & T 11:00 AM –1:00 PM, or by appointment
Phone
(530) 898-5480

Time and Location
Lecture
MW 3:00–3:50 PM in OCNL 124
Lab Section 2
T 8:00–11:00 AM in OCNL 340
Lab Section 3
W 8:00–11:00 AM in OCNL 340

Text Book
ISBN: 978-0-12-385059-1
Other resources will be posted on Learn

Course Usage of Blackboard Learn

Copies of the course syllabus, lecture notes, assignments, grades and extra course resources may be found on Blackboard Learn. You are responsible for regularly checking Blackboard Learn and your email for any updates and announcements.

Course Description

This course is an introduction to basic networking technologies and network management concepts, including major network operating systems, communication architecture focusing on ISO and Internet models (TCP/IP model) with discussion of current standards and protocols, communications switching and routing, network congestion, network topologies, network configuration and management, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols. Significant laboratory work using current networking equipment reinforces lectures and provides fundamental experience with router and switch management. By taking this course you are walking into a growing field that promises to continue to provide challenges and job demands for many years to come. 2 hours lecture, 3 hours laboratory.

Course Objectives

At the end of the course, you will:

1. be able to build an understanding of the fundamental concepts of computer networking.
2. be familiar with the basic taxonomy and terminology of the computer networking area.
3. be introduced to networking concepts, preparing you for advanced courses in computer networking.
4. gain expertise in some specific areas of networking such as the design and maintenance of individual networks.
Learning Outcomes

Upon successful completion of this course, you must demonstrate the knowledge and ability to:

1. independently understand basic computer network technology.
2. understand and explain Data Communications System and its components.
3. identify the different types of network topologies and protocols.
4. enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. identify the different types of network devices and their functions within a network
6. understand and build the skills of subnetting and routing mechanisms.
7. design and configure a computer network
8. work in groups

Course Prerequisites

CSCI 111 and either CINS 220 or CSCI 221 or EECE 237 (all with a C or higher).

Academic Evaluation

Labs 20%
Programs 15%
Quizzes 10%
Exams 30% (exams are equally weighted)
Final 25%

Grading Policies

• Labs are due at the start of the following lab meeting. However, for certain labs, there will be questions in the lab handout that must be completed and graded during the lab session (not the following week when the lab is due). No credit will be given if the questions are not signed off during the lab period.
• Prelabs will be collected at the start of the lab and will not be accepted after the due date.
• Labs and prelabs will not be accepted after the deadline.
• All programming assignments turned in 1-24 hours after the due date will lose 20%.
• Any assignment (program, lab, prelab) sent to my email (before or after the deadline) will NOT be accepted.
• All assignments (program, lab, prelab) due dates will be posted on every assignment.
• Grades will be posted on Learn.
• All grading corrections must be done within one week from the date the grade is posted. After one week, grades will not be reviewed.
• Extra credit/bonus points may be given at the discretion of the professor.

Make sure to download and keep a copy of all assignments, programs and labs. Labs, programs and assignments that will be posted on Blackboard, will not be available once the deadline is over.

Labs

• Lab attendance is mandatory. If you miss the lab (without a valid and documented excuse) you will get an automatic 50% deduction of your grade.
• You will complete weekly labs in pairs (unless stated otherwise) using hardware/software in OCNL 340. These labs provide you the opportunity to experiment and investigate material covered in lecture.

Programs/Assignments

You will complete:
• Several programming assignments in C or C++ to implement some of the topics covered in lecture. **Before you turn in your program, make sure it compiles and runs in OCNL 340. Any program that does not compile in OCNL 340, will receive a grade of zero.**

• You will complete several written assignments (problem solving) over the semester to enhance material covered in lecture. Assignments will not be collected however you are highly encouraged to do them.

**Exams**

Two exams and a cumulative final exam will test your understanding of the course material. The university posts the Final Exam time and location, so check Learn periodically.

There will be short quizzes (generally online) on material covered in lab and lecture.

Note the following course policies concerning exams:

• You may not leave and return to class during an exam session, so use the restroom before starting an exam. Exceptions will be made for medical necessity if arranged in advance.

• You may not start an exam after another student has completed the exam and left.

• No makeup exams will be provided unless under extreme circumstances (death in the family, sickness), with a supportive document (doctor document, etc.).

• Wireless devices must be turned off or put on silent mode and stored away during lectures, labs and exams.

**Grade Classification**

Grades are assigned based on your work according to the following criteria. I will round up decimal points to the nearest integer.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Class Average</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>93 - 100</td>
</tr>
<tr>
<td>A-</td>
<td>90 - 92</td>
</tr>
<tr>
<td>B+</td>
<td>87 - 89</td>
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<tr>
<td>B</td>
<td>83 - 86</td>
</tr>
<tr>
<td>B-</td>
<td>80 - 82</td>
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<tr>
<td>C+</td>
<td>77 - 79</td>
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<tr>
<td>C</td>
<td>73 - 76</td>
</tr>
<tr>
<td>C-</td>
<td>70 - 72</td>
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<tr>
<td>D+</td>
<td>67 - 69</td>
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<tr>
<td>D</td>
<td>63 - 66</td>
</tr>
<tr>
<td>F</td>
<td>0 - 59</td>
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</tbody>
</table>

**Academic Integrity**

You will be held to high academic standards. Any academic misconduct, intentional or through negligence, may be reported to Student Judicial Affairs (SJD). A first offense (in any course) may result in a negative score equal to the assignment value. Further offenses result in a failing grade and referral to SJD. Egregious incidents of academic dishonesty may result in immediately failing the course and referral to SJD. If you have any doubts or questions about academic integrity, please see the Student Judicial Affairs website. If you have any doubts or questions about academic integrity, please see the Student Judicial Affairs website[^1].

Academic dishonesty includes, but is not limited to:

[^1]: http://www.csuchico.edu/sjd/integrity.shtml
• Copying work from another student
• Providing work for another student to copy
• Copying work from unapproved sources (e.g., the Internet, a book)
• Failing to protect your work from copying (e.g., leaving your work in a public place, poor file permissions on shared systems)
• Receiving so much help that your work does not represent your efforts

Acceptable Behavior

You must act in accordance with university guidelines and refrain from disrupting the learning environment. Any behavior that diminishes the learning opportunities of fellow students may result in eviction from the class, removal from the course, immediate failure of the course, or referral to Student Judicial Affairs.

Attendance and Punctuality

• Attendance during lecture is highly encouraged, but not required, except during the days when Exams are given. Coming to lecture gives you the opportunity to ask questions, do collaborative work, network with your peers, hear tips and hints about exams, etc. Habitual absences negatively impact your learning and your grades. The number one predictor of success or failure in this course is "engaged attendance". To make the most of your time in class, be sure to do the assigned reading before you come to lecture. During lecture and lab, you are expected to be focused on the material from this course. Turn off phones, use laptops only for course-related tasks, and minimize distractions to yourself and the other students in the course.
• I will give bonus (participation) points during lecture, but you can collect these points only if you are present in the lecture.
• You must arrive to class and turn any assignment due by the start of the lecture. Once class starts, work loses 20%.
• In the event you miss class, you are responsible for all subject matter, announcement and procedural information discussed in class.

Get Help

In addition to my office hours, you can email me with any specific questions using your CSU-Chico email account. Make sure you sign your email and you put the course code and the section number (‘CSCI 446 Section 1’ for example) in the subject so it will be filtered correctly. All emails with no subject or not using CSU-Chico email will not be opened. I generally reply to emails within 24 hours.

Religious Holidays

I will work with you so this class and its assignments, exams, and activities do not interfere with religious holidays. However, you must notify me ahead of time so we can make appropriate arrangements.

Americans with Disabilities Act

If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.
Confidentiality and Mandatory Reporting

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I may also have a mandatory reporting responsibility related to my role. 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 information regarding sexual misconduct with the University. You may speak to someone confidentially by contacting the Counseling and Wellness Center (898-6345) or Safe Place (898-3030). Information on campus reporting obligations and other Title IX related resources are available here: http://www.csuchico.edu/title-ix.

Lecture Schedule

The following is a tentative schedule for the semester. Due dates are approximate and subject to change; check Learn for exact dates.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
<th>Due Date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Course overview</td>
<td>Chapter 1(1.1-1.5)</td>
<td></td>
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<tr>
<td>2</td>
<td>Links, layers, framing, error handling</td>
<td>Chapter 2(2.1-2.4)</td>
<td></td>
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<td>3</td>
<td>Reliable transmission, sliding windows, MAC</td>
<td>Chapter 2(2.5-2.6)</td>
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<tr>
<td>4</td>
<td>Bridging and switching</td>
<td>Chapter 3(3.1)</td>
<td>Program 1</td>
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<tr>
<td>5</td>
<td>Exam I - covers chapters 1 and 2 and lab</td>
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<tr>
<td>6</td>
<td>Internetworking</td>
<td>Chapter 3(3.2.1-3.2.6)</td>
<td></td>
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<tr>
<td>7</td>
<td>IP Support and IPv6</td>
<td>Chapter 3(3.2.7-3.2.8),4(4.1.3)</td>
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<td>8</td>
<td>Spring Break</td>
<td></td>
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<tr>
<td>9</td>
<td>Routing and distance-vector protocol</td>
<td>Chapter 3(3.3.1-3.3.2)</td>
<td>Program 2</td>
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<tr>
<td>10</td>
<td>Link state protocol</td>
<td>Chapter 3(3.3.3)</td>
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<tr>
<td>11</td>
<td>Transport layer</td>
<td>Chapter 5(5.1-5.2)</td>
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<tr>
<td>12</td>
<td>Exam II covers: material covered after exam I, chapters 3, 4 and lab</td>
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<tr>
<td>13</td>
<td>Congestion control and resource allocation</td>
<td>Chapter 6(6.1-6.2)</td>
<td>Program 3</td>
</tr>
<tr>
<td>14</td>
<td>TCP Congestion Control and HTTP</td>
<td>Chapter 6(6.3),9(9.1.2)</td>
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<tr>
<td>15</td>
<td>NAT, HTTPS and DNS</td>
<td>Chapters 8(8.4.3),9(9.3.1)</td>
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<tr>
<td>16</td>
<td>Wireless Communication (802.11)</td>
<td>Chapter 2(2.7)</td>
<td>Program 4</td>
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<tr>
<td>17</td>
<td>Final Exam</td>
<td></td>
<td>TBA</td>
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